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## FEATURES

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■ Mobile Harbour Equipment

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SEPTEMBER 2018 issue

featuring...



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# Varying signals for dry bulk trade

**A**mid signs of strengthening headwinds for international trade generally, prospects for many elements of global commodity import demand remain fairly sturdy. While further growth in world seaborne dry bulk trade is not expected to be rapid, a moderately advancing trend could persist into 2019.

Ten years after the events which triggered the global financial crisis, major economies are still relying on abnormal monetary policy stimulus for support. But in the past year or so indicators of economic growth in many countries suggested that momentum was being regained, with benefits for dry bulk cargo movements. More recent news, however, has highlighted potential for setbacks resulting from serious trade tensions.

## GRAIN & SOYA

Large and often unexpected changes in weather affecting crops are a feature of the setting for grain and soya trade. This year has seen unfavourable weather damaging cereal and oilseed output in South America, reducing export availability, and also damaging grain harvests in northern Europe, potentially boosting import demand.

Another focus of attention is prospects for China's soya imports since purchases from the USA were subjected to new tariffs. Reflecting the changed circumstances, the US Dept of Agriculture's estimate for China's soyabean imports from all sources, in the new 2018/19 marketing year

starting next month, now shows a fall. After a forecast 3% rise in the current year which is ending, to 96mt, a decrease to 95mt is expected. Chinese soya imports comprise almost one-fifth of all world grain and soya trade.

## IRON ORE

Following a solid steel industry performance around the world in the first half of this year, indications of the future trend have become more varied. A complex global pattern of steel products trade is likely to be distorted by additional tariffs, assuming that these continue. Signs of a possible slowing growth of economic activity in some countries could also have an impact on steel output volumes.

Among iron ore exporters, Australia and Brazil together comprise over four-fifths of global seaborne trade in this commodity. Several forecasters expect both suppliers to achieve higher levels in 2018 as a whole. Australia's iron ore exports could increase by up to 4%, reaching about 860mt. In Brazil, a similar 3–4% rise to over 390mt (million tonnes) is suggested. New capacity being added has enhanced potential for further expansion.

## COAL

A cautiously optimistic view of the coal trade trend this year and into 2019 still points to modest expansion, despite clear signs of negative longer-term influences in numerous importing countries. The main uncertainty surrounds prospects for the dominant

steam coal sector, amid unrelenting pressure for cleaner energy sources to contribute a rising proportion of electricity generation.

European steam coal import demand looks set to be weakened further this year but, by contrast, signs for the much larger Asian market are mostly more promising. Seaborne imports of steam coal into the European Union apparently totalled over 105mt in 2017, of which Germany's share was almost one-third. During the current year imports by Germany, and by several other EU members including Spain, could decline sharply as alternative energy supplies continue to displace coal.

## MINOR BULKS

The extensive minor bulks trade category is always difficult to predict because of the many elements and huge variety of cargoes, industrial, agricultural and including semi-manufactures. Recent signs have suggested that positive influences prevail, although uncertainty about annual seaborne steel products trade of around 400mt has escalated since the US imposed new tariffs on imports.

## BULK CARRIER FLEET

In the world bulk carrier fleet, expansion of carrying capacity during 2018 could be similar to last year's 3%. As shown in table 2, the impact of lower newbuilding deliveries is likely to be largely or wholly offset by the effect of greatly diminished scrapping of older or uneconomic vessels.

**TABLE 1: MAJOR GRAIN EXPORTING AREAS (MILLION TONNES)**

	WHEAT AND COARSE GRAINS, CROP YEARS ENDING JUNE					
	13/14	14/15	15/16	16/17	17/18	18/19*
North America	106.6	108.2	102.9	122.0	114.1	123.4
South America	41.0	49.1	67.7	51.8	74.3	71.0
Black Sea	66.4	70.9	82.2	88.3	102.7	92.8
EU	40.0	48.1	46.9	34.6	29.9	31.7
Australia	25.6	23.5	22.0	31.9	23.7	24.9

source: International Grains Council \*forecast, 23 August 2018

**TABLE 2: WORLD BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)**

	2013	2014	2015	2016	2017	2018*
Newbuilding deliveries	63.0	48.2	49.3	47.2	38.4	28.0
Scrapping	23.2	16.4	30.7	29.3	14.7	4.5
Losses	0.5	0.1	0.2	0.2	0.3	0.2
Other adjustments/conversions	0.3	0.1	-0.6	-0.6	0.0	0.0
Net change in fleet	39.6	31.8	17.8	17.1	23.4	23.3
Fleet at end of year	727.1	758.9	776.7	793.8	817.2	840.5
% growth from previous year		4.4	2.3	2.2	2.9	2.9

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

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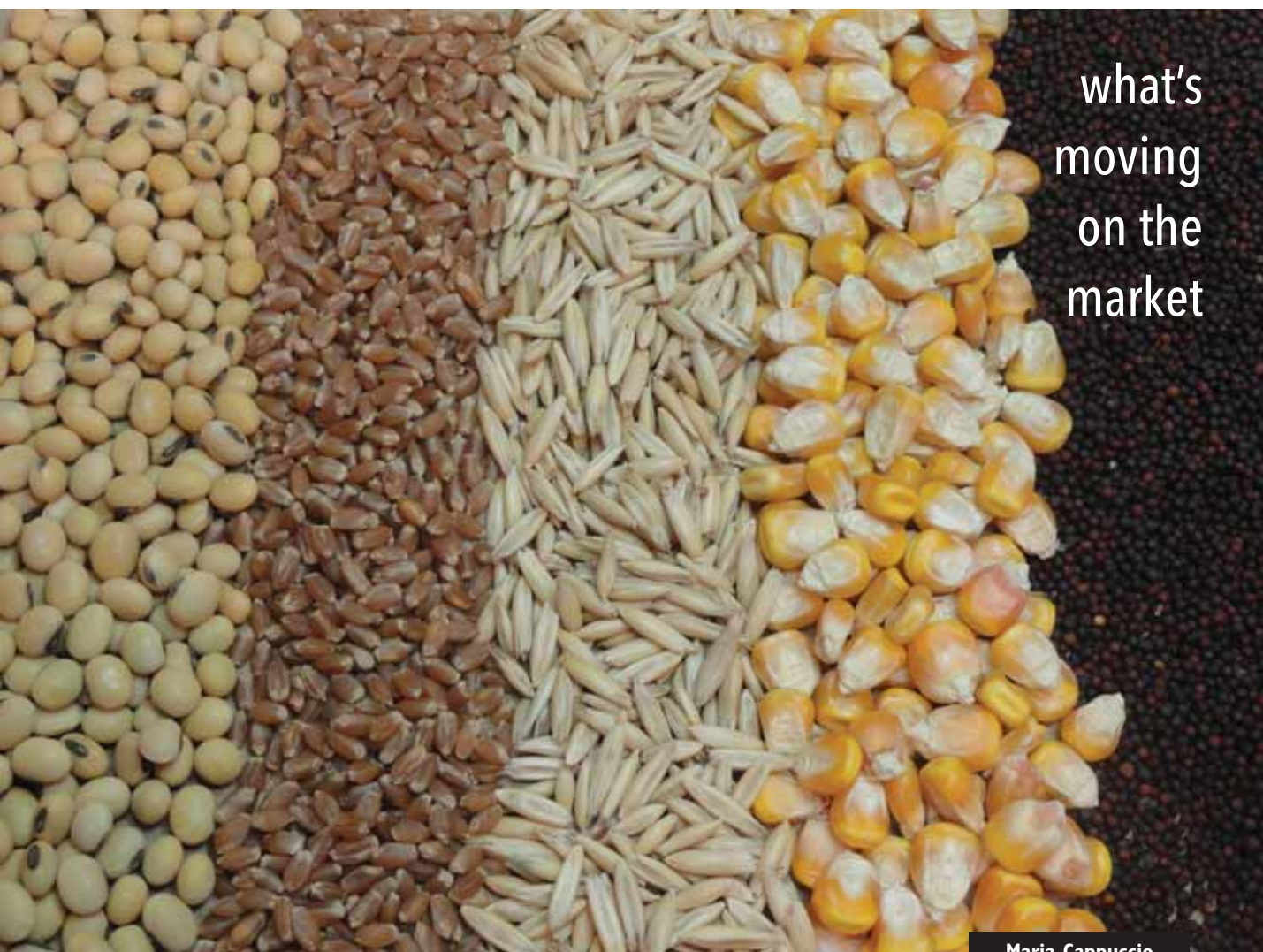
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# Feedstuffs, grains and oilseeds

what's  
moving  
on the  
market



Maria Cappuccio

## GRAIN STOCKS FALL ON LOW OUTFURN AND RECORD DEMAND

Against the backdrop of increasing geopolitical risks and mounting trade disputes, challenging weather conditions created uncertainties in agricultural markets. Hot dry weather and drought affected wheat output especially in the EU, Russia and in other major exporting countries, with the global wheat harvest falling for the first time in four years. By contrast, coarse grains are to rebound from last year and prospects for oilseeds remain favourable and expected to lift global output to over 2.6bn/t in 2018. Record demand for feed, food and

industrial use of wheat and coarse grains anticipated to result in a substantial drawdown of grain stocks.

## WHEAT SUPPLIES DECLINE IN MAJOR EXPORTERS

Global grains output is increased, despite reduced wheat crops in the EU, Russia, Ukraine, Canada and Australia. While coarse grain production due to a larger acreage and good yields, is forecast to recover rising to 1,347mt (million tonnes), with better crops in the US, China, Ukraine, Brazil and Argentina. The global oilseed crop is forecast higher at 605mt, due to a larger planted area with gains led

by soybeans 369mt, sunflower seed and palm kernel.

## FEED DEMAND REFLECTS GROWTH IN MEAT CONSUMPTION

USDA forecast total grain use at 2.13bn/t, food/industrial use to rise by 23mt with feed grain use rising to 974mt, due to increasing corn use mostly in China, US and the EU, as corn picks up demand from wheat. The expected higher use of corn for feed in 2018/19 is seen to more than offset anticipated reductions in feed use of other major cereals, in particular barley and wheat. With growing demand for animal feed and vegetable oil, oilseed crush is

## MAJOR FEEDSTUFFS — PRODUCTION, USE, FEED &amp; STOCKS 2017–2019 (MT)

	Prod 17/18	Prod 18/19	Use 17/18	Use 18/19	Feed 17/18	Feed 18/19	Trade 17/18	Trade 18/19	Stocks 17/18	Stocks 18/19
Wheat	758	733	741	746	144	141	183	182	274	261
Coarse grains	1,315	1,347	1,354	1,386	816	833	188	196	224	185
Total grains	2,073	2,080	2,095	2,132	960	974	371	378	498	446
Oilseeds	574	605	*483	*500	**329	**339	177	181	110	122

Source: IGC/USDA-Prod-mainly harvested Jul-Dec/Local Marketing years

\*Oilseed crush \*\*Oil meals feed use-excludes fishmeal

expected to increase by 17mt to 500mt, with oil meal use for animal feed to rise by 10mt to 339mt, mostly in China, EU, US, Russia and India. Over the next decade population is expected to be the main driver of future consumption growth for most commodities with feed the primary source of demand growth for cereals and oilseeds, followed by food.

### RECORD TRADE FOR GRAINS AND OILSEEDS

Global trade in wheat and coarse grains is projected at 378mt, reflecting an increase in corn shipments, with grain stocks expected to contract by a hefty 52mt to 446mt including China's 195mt stockpile. Trade in oilseeds is forecast at 181mt with stocks expected to rise to 122mt by the end of 2018/19.

### SUBSTANTIAL FALL IN WHEAT OUTPUT

The largest year-to-year reductions are for the EU and Russia down by a combined 28mt; Russia's wheat crop has been revised up to 71mt still below last year's exceptional 85mt crop. EU wheat output to fall to 138mt. The wheat crop in Germany substantially reduced to 19mt with smaller crops in France, UK and Poland, the prolonged hot dry weather prompted the EU to take measures to increase fodder resources for livestock.

### TAX ON ARGENTINE EXPORTS MAY DELAY WHEAT SALES

Argentina's wheat crop is projected to rise to 19mt, but the government's decision to

### GLOBAL WHEAT PRODUCTION 2014–2018/19 (MT)

	2014/15	2015/16	2016/17	2017/18	2018/19
EU	157	161	145	152	138
Other Europe	4	4	5	4	5
CIS Baltic's	112	118	130	142	126
N & C America	88	88	99	81	85
S America	25	22	29	25	27
N East Asia	35	42	39	42	40
F East Asia	258	251	251	264	263
Africa	24	28	22	27	29
Oceanic	24	23	32	22	20
Total	728	736	752	758	733

Source: FAO, USDA, IGC trade-totals may not add due to rounding

raise the rates shippers pay on grain exports, to help reduce the fiscal deficit, may encourage growers to delay wheat sales and influence planting decisions.

### AUSTRALIA'S WHEAT CROP LOWER

Dry weather in Eastern Australia, persistent for over a year in Queensland and New South Wales, is expected to continue through September–November, intensifying a drought that has wilted crops while leaving wheat and other crop plantings, below normal. Despite better weather and record crops in Western Australia, wheat output is expected to fall to around 20mt.

### EU FEED DEMAND SWITCHES TO CORN

Global feed wheat use in livestock feed rations is forecast to fall by 3mt to 141mt, mostly in the EU, where feed wheat use is lower at 53mt. Tight supplies saw higher

domestic values in Germany's South Oldenburg Market in August — well over milling wheat at €219/t (\$255/t) and in other key areas as farmers and feed manufacturers switched from feed wheat to corn.

### RUSSIA'S WHEAT EXPORTS SET A BRISK PACE

Adverse weather conditions stoked fears of tight supplies, with Black Sea wheat exports lower at 60mt (Russia 35mt, Ukraine 16.5mt, Kazakhstan 8.5mt) and EU exports at 20mt, supported prices across the grains/oilseed complex, but improved prospects in the US and elsewhere, and, news that there would be no cap or tax on Russian exports, despite the sharp fall in wheat production, weighed on wheat markets. While opportunities exist for larger exports from the US 29mt and Canada 24mt, Russian wheat remains the most competitive on the world market, with exports at 8mt up 60% on last year, while the pace of exports is expected to slow, exactly when continues to influence price movements.

### LOWER OUTPUT TIGHTENS WHEAT STOCKS

Global wheat stocks are expected to fall to 261mt — China's 136mt stockpile represents over 50% of the total, masking the extent to which global supplies of wheat are tightening; excluding China,

### WORLD WHEAT SUPPLY & DEMAND 2014–2018/19 (MT)

	2014/15	2015/16	2016/17	2017/18	2018/19
Production	728	735	752	758	733
Consumption	704	711	739	741	746
Trade	162	172	182	183	182
Stocks	219	244	257	274	261
of which China	76	97	111	127	136
Key exporters *	60	65	66	72	55

Sources: IGC, USDA-Production-mainly harvested Jul-Dec/Local marketing years

\*Argentina, Australia, Canada, US, EU, Kazakhstan, Russia, Ukraine



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global wheat stocks are projected lower at 125mt by end of 2018/19. Benchmark December milling wheat on Paris-based Euronext, settled down at €197.50/t (\$228.54 06 Sept '18). CBOT Wheat SRW Contract Dec '18 closed down at \$5.112/bu (\$187.82 7 Sept '18) and UK feed wheat saw prices fall from a peak of £190/t in August almost £16/t. UK feed wheat futures contract Nov '18 closed down £174.60 (\$225.60 07 Sept '18)

### COARSE GRAINS TO REBOUND IN 2018/19

A bumper crop in the US, better crops in China, Ukraine, Argentine and Brazil expected to offset smaller outturn in the EU and Russia. The global coarse grain crop is projected to recover in 2018/19 rising to 1,342mt (corn 1,069mt, barley 143mt, sorghum 59mt).

### RECORD DEMAND SHARPLY REDUCES STOCKS

Global coarse grain use is forecast to rise to an all-time high, outpacing production, reflecting continued growth in feed and industrial use up by 32mt to 1.386bn/t in 2018/19. Strong demand for feed set to rise by 17mt to 833mt especially in the US, China, and in the EU; with food/industry projected to rise by 15mt to 553/t underpinned by greater use of corn to produce fuel ethanol and starch in China, Brazil and the US.

Trade is boosted 8mt to 196mt on larger imports to Mexico, Saudi-Arabia, EU, Iran, Bangladesh, with global stocks expected to fall by 39mt to 185mt, including those held in the major exporting countries by the end of 2018/19.

### US YIELDS BETTER THAN EXPECTED

With yields higher than expected, global corn production is forecast to rise by 28mt to 1,069mt in 2018/19, the second highest crop on record. USDA pegs the US corn crop at 377mt based on yields of 178.4bu/acre. Larger crops are anticipated in China 225mt, Ukraine 31mt, Serbia 7mt and in South America.

## WORLD COARSE GRAIN SUPPLY & DEMAND 2014–2018/19 (MT)

	2014/15	2015/16	2016/17	2017/18	2018/19
Production	1,312	1,263	1,370	1,315	1,342
Consumption	1,277	1,259	1,356	1,354	1,386
Trade	174	185	199	188	196
Stocks	244	248	262	224	185
of which China:	102	112	102	80	59
Key Exporters*	—	—	112	97	87

Source: IGC/USDA \* US, Argentina, Brazil, Russia, Ukraine, EU, Australia, Canada

### SOUTH AMERICA CORN OUTPUT TO RISE

Corn acreage in Argentina is expected to increase to 5.8m/ha for planting in October and December, with the corn crop forecast at 41mt; the decision by the government to introduce a tax on Argentina's corn exports is vehemently opposed by growers, citing lower profitability and reducing the planned increase in acreage for corn. Brazil's corn prices seen supporting a rise by over 1m/ha in the planted area with a crop of 95mt, 13mt up on last year.

### SHARP INCREASE IN DEMAND FOR FEED

Global corn production is likely to be 37mt short of projected demand at 1,106mt for the second successive year. Corn demand for feed, is up 24mt to 677mt with food, starch and ethanol use, expected to rise by over 15mt to 429mt. Feed use is expected to increase in several countries including China 7mt, US 4mt and in the EU, where corn use is set to rise by 6.5mt to over 65mt. Corn acreage in the EU is shrinking and smaller crop forecasts for barley, oats, rye and damaged pasture in northern Europe, due to persistent dry conditions have exacerbated the feed deficit. Corn imports have been steadily expanding due to domestic demand for the livestock sector; taking advantage of nearby producers and price advantage likely to support the EU's continued use of corn in feed.

### GROWING MEAT DEMAND DRIVEN BY PIG AND POULTRY

Before the outbreak of African swine fever

(ASF) in China, global meat output in 2018, was forecast to exhibit its fastest growth for over five years, with much of the expansion projected in China, the US, Brazil, the EU, Russia, India, Mexico and Turkey. All the major meat categories anticipated to contribute, with demand supported by large feed supplies, a positive economic outlook and the ongoing urbanization process in many developing countries. Poultry and pig meat forecast to remain the most consumed meat categories in 2018, with about 16kg per capita each, followed by beef at 9kg and sheep meat at 2kg.

### CHINA BATTLING TO CONTROL OUTBREAK ASF

Since August, China has been battling to control a catastrophic outbreak of ASF, which has hit six provinces Liaoning, Henan, Jiangsu, Zhejiang, Anhui and Heilongjiang, resulting in the cull of over 40,000 pigs. Since then further outbreaks have been identified involving other provinces. The FAO, confirmed that ASF is spreading rapidly in China, almost certain to spread elsewhere and convened an emergency meeting in Bangkok, at the beginning of September, with participants from ten Asian countries.

### IMPACT OF ASF ON THE GLOBAL MARKET

While the cull of pigs so far represents a small proportion of the Chinese pig herd, China is the biggest producer, importer and exporter of pork, which massively increases the risk of ASF crossing borders and infecting pig herds globally. The Chinese authorities have banned the transport of pigs and pork products and shut live hog markets in the affected areas, likely to push pork prices higher, while transport of pigs and pork products will take much longer. The impact on the global market will depend on the scale and spread of the disease and the latest case reported in Belgium may represent, "...a new change in the epidemiologic situation of ASF worldwide" according to Paul Sundberg of

## WORLD CORN GRAIN SUPPLY & DEMAND 2014–2018/19 (MT)

	2014/15	2015/16	2016/17	2017/18	2018/19
Production	1023	973	1079	1034	1069
Consumption	988	970	1061	1067	1106
Trade	128	145	160	150	158
Stocks	207	210	228	224	185
of which China:	101	111	101	80	59
Key Exporters*	56	54	79	65	61

Source: IGC/USDA \* US, Argentina, Brazil, Russia, Ukraine, EU, Australia, Canada



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the US-based Swine Information Centre, suggesting that the disease may have reached pandemic proportions considering ASF expansion across Europe and over considerable distances in China over the last year, in addition to the sustained occurrence of outbreaks in Africa and Russia.

#### AGGRESSIVE SALES BOOST CORN EXPORTS

Global trade is expected to rise over 158mt with larger exports from the US 61mt, Brazil 25mt, Argentina 27mt and Ukraine 25mt, to meet rising demand in a number of countries including, the EU, Mexico, Colombia, South Korea and Iran. In the EU imports are forecast to rise to 19.5mt. Forward prices indicate that feed wheat and barley are unlikely to be competitive with corn through 2018/19, as corn prices have fallen sharply since August at key export ports — US Corn 3YC FOB (Gulf) \$156/t, Argentina Feed FOB (Up River) \$156/t, Brazil Feed FOB (Paranagua) \$166/t (13 Sep 2018).

#### CANADA EXCLUDED FROM SAUDI GRAIN TENDERS

Global production of barley is forecast at 143mt, 1mt below last year. Smaller crops in Russia and Ukraine offset by larger crops in Canada, Morocco, Algiers and Argentina. Feed/food use 4mt lower at 144mt with stocks almost 18mt. Trade is forecast at 29mt dominated by China with imports of 9mt and Saudi Arabia 8mt. The dispute between Canada and Saudi Arabia, led the Saudi regime to sell off assets in Canada, expel the Canadian ambassador, while SAGO, the state wheat buyer stopped buying Canadian wheat and barley through its international tenders.



#### RECORD OILSEED CROPS ANTICIPATED IN 2018/19

Preliminary estimates indicate the global oilseed crop will rise to a record 605mt in 2018/19, led by soybeans 369mt with better crops for sunflower seed 50mt, palm kernel 19mt, with smaller crops for rapeseed 72mt, cotton seed 44mt, groundnut 45mt. EU prospects for sunflower seed improved but outweighed by poor rapeseed yields.

#### ARGENTINE SOY OUTPUT TO REBOUND

The US soybean crop is forecast at 138mt with Argentine production to rebound

MAJOR OILSEED SUPPLY & DEMAND 2014–2018/19 (MT)					
	2014/15	2015/16	2016/17	2017/18	2018/19
Production	539	525	574	574	605
of which (Soybeans)	320	316	348	337	369
Crush	440	446	470	483	500
Consumption*	294	303	319	329	339
Trade Meals*	86	87	88	88	90
Trade Seeds	147	153	170	177	181
Stocks	95	94	111	110	122
of which (soybeans)	56	58	70	66	82
key exporters**					

Source: USDA/\*Meals cons/trade-excl. fishmeal \*\*Argentina, Brazil, US

rising to 62mt — the government is to raise the rates shippers pay on exports of soybeans/soy products to help reduce the fiscal deficit, likely to increase already elevated prices due to the drought-reduced crop last year.

#### SALES OF NEW CROP SOY RISE ON WEAKER REAL

With Brazil's upcoming election in October, market fears that Brazil will fail to elect a business-friendly candidate have weakened the real, which hit its lowest closing point on 13 September. Brazil's soybean crop is pegged at 125mt in

below last year, are destined for the Chinese market, following the trade dispute between the US and China, which resulted in tariffs being placed on selected goods/products by each side worth around \$34bn. For the US the loss of soybean sales to China for 2018 and 2019, sent US soybean futures to their lowest level in a decade, prompting the US Department of Agriculture to roll out a \$12bn rescue package for those growers affected. With the threat of further tariffs, news that the US and China are to resume talks that could ease trade tensions will be closely monitored.

#### BRAZIL'S SOY SUPPORTED BY CHINESE DEMAND

With Chinese buyers keen to mop-up Brazil's exports for old crop and to secure new crop supplies, resulted in higher prices for Brazil's soybeans FOB (Paranagua) \$394/t, making US soybeans FOB (Gulf) \$308/t (13 Sept 2018) more competitive. This trend seems likely to continue and may strengthen in the coming months. The USDA forecasts China's imports at 100mt but recent comments from China

suggest soy imports likely to be revised down.

#### GLOBAL OILSEED CRUSH TO RISE IN 2018/19

Global oilseed crush expected to rise by 17mt to 500mt, with oil meal use to rise by 10mt to 339mt, supported by expanding demand for animal feed and soy oil. With ongoing outbreaks of ASF a threat to pig production and feed demand in China and reports of record oilseed crops, weighed on soybean prices Chicago's Soybean (Nov) Contract closed down \$8.304 (\$305/t — 13 Sep 2018).

2018/19 with planting to start in October — analysts Safra & Mercado confirms that Brazilian growers have already sold almost 23% of next year's expected production, partly motivated by a strong US dollar against the real—the uptick in sales coinciding with a drop in the value of the real to below four reals per US dollar.

#### NEW ROUND OF TRADE TALKS BETWEEN US AND CHINA

Global trade in oilseeds is expected to increase by 4mt to 181mt mainly due to the recovery in Argentina's exports. The majority of Brazil's 75mt exports, a little

## The Marshall Islands Registry recognizes Green Award Ships

The Republic of the Marshall Islands (RMI) Registry and Green Award announce cooperation. The RMI Registry will recognize Green Award certified ships with an incentive to motivate further efforts for excellence. In support of quality shipping and promotion of high environmental standards, the RMI Registry has joined the Green Award scheme. Ships registered in the RMI and certified by Green Award will be granted a 30% discount on the annual marine services fee.

At a festive welcome ceremony held in Athens in September, Green Award Chairman, Captain Dimitrios Mattheou, and Executive Director, Jan Fransen, presented a Green Award plaque to Theo Xenakoudis, Director, Worldwide Business Operations of International Registries, Inc. (IRI), which provides administrative and technical support to the RMI Registry. Mattheou called this co-operation a huge step in the direction of an environmentally conscious and safe maritime industry of the future.

“Striking a balance between economically sound and environmentally and socially responsible shipping is of paramount importance. That’s a task for the entire maritime community. By supporting Green Award, the RMI Registry joins the frontrunners of the industry actively taking measures to reduce their ecological footprint and encourage improvement of safety,” continued Mattheou.

“Age is often an indicator of a greener fleet, and the RMI fleet is the youngest of any of the top ten registries. We have always aimed to make our fleet environmentally friendly and so we are pleased to see that more than 16% of Green Award vessels are RMI flagged. The RMI has also maintained its Qualship 21 status for 14 consecutive years and, in addition, more than 28% of the United States Coast Guard’s E-Zero designation vessels are RMI flagged. It is noteworthy to see that so many RMI owners and operators are going beyond the industry’s standard for environmental performance measures,” said Xenakoudis.

IRI is the world’s most experienced, privately held maritime and corporate registry service provider, specializing in the needs of the shipping and financial services industries across a broad commercial and economic spectrum. Headquartered just outside of Washington, DC in Reston, Virginia USA, IRI operates 28 offices in major shipping and financial centers around the world. The RMI Registry holds a leading



position among the top five flags worldwide with the most ships certified by Green Award.

Green Award is a voluntary international certification scheme for ships that go beyond the industry’s regulations in terms of safety, quality, and environmental performance. It provides a platform for maritime stakeholders to demonstrate the joint Corporate Social Responsibility and benefit from extra efforts invested in the improvement beyond legally required standards. Participation of the industry’s key stakeholders is crucial to recognize excellent ships and motivate others for improvement. The Marshall Islands Registry joining Green Award is a perfect example of such collaboration..

### ABOUT GREEN AWARD FOUNDATION

Green Award certifies sea-going oil and chemical tankers, bulk carriers, LNG and LPG carriers, container carriers, inland navigation barges and inland passenger ships. Its assessment criteria cover environmental, quality and safety aspects, and performance of management and the crew. With this comprehensive approach and a diverse team of the industry’s experts supporting the scheme, Green Award secures the quality of its audits and real value of its certificate.

With over 120 ports and other maritime related organizations giving discounts to the certified companies and ships, the scheme motivates ship owners and managers to invest in the improvements on board and ashore and serves as a reliable Corporate Social Responsibility

and risk reduction tool for participating shipping companies, ports and maritime service providers.

### ABOUT IRI/THE MARSHALL ISLANDS REGISTRY

International Registries, Inc. and its affiliates (IRI) provide administrative and technical support to the Republic of the Marshall Islands (RMI) Maritime and Corporate Registries. The RMI Registry is the second largest in the world, surpassing 162 million gross tonnes with 4,442 vessels at the end of August 2018. IRI has a network of 28 worldwide offices in major shipping and financial centres worldwide that can register a vessel, including those under construction, record a mortgage or financing charter, incorporate a company, issue seafarer documentation, and service clientele.

The RMI fleet has received the highest ratings in port State control international rankings. The RMI is on the White Lists of both the Paris and Tokyo Memorandums of Understanding (MoUs) and has also met the flag criteria for a low risk ship under the Paris and Tokyo MoU’s New Inspection Regimes. It is the only major registry to be included on the United States Coast Guard’s Qualship 21 roster for 14 consecutive years. The RMI is the only one of the top three flag States that holds Qualship 21 status, an acknowledgement that is paramount for the RMI owners and operators. The most important asset to the RMI Registry is its customers and IRI strives to provide them with full service from any office, 24 hours a day.

# Thordon Bearings and Heddle Marine team up to convert ships to pollution free propeller shaft lines

In August this year, Thordon Bearings Inc. and Heddle Marine Service Inc. signed a co-operative agreement under which the Canada-based ship repair company will work together with Thordon Bearings Inc. to promote the conversion of ships' oil-lubricated propeller shafts to Thordon's COMPAC open seawater-lubricated bearing system.

The agreement will create an action plan in which a specialist team, comprised of Heddle Marine and Thordon Bearings' personnel, to offer support to ship managers and owners looking to ensure their vessels are fully compliant with environmental legislation prohibiting the discharge of oil from the oil-to-sea interface of ships' propeller shafts. Shipowners could face substantial financial penalties if their vessels are found to be non-compliant.

Shaun Padulo, President of Heddle Marine said: "Thordon Bearings is a pioneer in water lubricated propeller shaft bearings, with over 40 years' of experience in this technology. By entering into this partnership, we will not only have an opportunity to expand our service offering from a local supplier, but will also have the opportunity to provide our customers with a real, long-term solution to the environmental problems they face with oil lubricated stern tube bearings and seals. With concerns increasingly being raised about the impact of pollution from ships on the marine environment, converting an oil

lubricated system to seawater is the only guaranteed solution for today and tomorrow."

Terry McGowan, President and CEO of Thordon Bearings said: "Heddle Marine is one of Canada's leading shipyards with the capabilities and facilities required to carry out specialised ship repair, maintenance and conversion projects. And they have recently expanded to support the Great Lakes and eastern Canada."

Leaking shaft seals are known to be a significant contributor to on-going pollution at sea. The use of biodegradable lubricants, which are an improvement over mineral oils, are still an extremely expensive option for shipowners and some are having seal compatibility issues. Even biodegradable lubricants still need to be reported to authorities when discharges occur. Thordon provides a solution that uses seawater as the lubricant that meets all regulations, eliminating any risk of oil pollution.

"Seawater lubricated propeller shaft bearing systems are less complicated and time-consuming to install than oil lubricated systems, providing clear commercial advantages for Heddle Marine and its customers," said McGowan. "There are fewer components, fewer pipe-runs, and no oil is required with a seawater lubricated system.

"Additionally, with recent class society rule changes, seawater lubricated propeller shaft bearing systems no longer have

pre-determined shaft withdrawals as long as certain monitoring conditions are met."

He added: "This new partnership agreement provides a win-win situation for both parties. Heddle Marine will stand to benefit from having new customers and a new revenue stream with oil-to-water conversions, while Thordon Bearings will benefit from supplying the COMPAC seawater lubricated bearing equipment for upcoming conversion projects."

Under the terms of the agreement, Thordon Bearings will also provide equipment, training and guidance to Heddle Marine personnel and support the yard in carrying out propeller shaft conversion projects to the "highest standards and in the most efficient and cost effective manner."

## ABOUT THORDON BEARINGS:

A global manufacturer of seawater lubricated propeller shaft bearing systems, with over 35 years' experience in this technology, Thordon Bearings is renowned for supplying high performance, oil and grease-free bearing systems to the global marine, clean energy, pump and offshore markets. Thordon Bearings is the only manufacturer of propeller shaft bearings to guarantee its award-winning COMPAC system for a 15-year wear-life. Thordon systems and bearings are available worldwide through over 80 agents and distributors.



*Shaun Padulo, President at Heddle Marine (left) and Terry McGowan, President and CEO at Thordon Bearings, sign an agreement that affirms the two companies' efforts to convert ships to seawater lubricated propeller shaft lines from oil.*

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## NORDEN adopts SEDNA as system of record for transaction management

**MAJOR SHIPPING COMPANY ESTIMATES THAT SEDNA WILL REDUCE INTERNAL EMAIL TRAFFIC TO USERS BY 75%, AND SUPPORT ITS 'FOCUS & SIMPLICITY' BUSINESS STRATEGY**

In mid-August, Danish dry cargo and product tanker operator NORDEN announced the selection of SEDNA as a new platform for transaction management and team collaboration. NORDEN will use SEDNA across its business, replacing email as the default mode of communication for teams, and forming a key part the company's business strategy of 'Focus & Simplicity'.

With an owned and chartered fleet of over 300 dry cargo and tanker vessels, NORDEN is the latest in a line of businesses in the shipping industry to adopt SEDNA's software.

This reflects a growing awareness of the latent efficiencies hidden in email workflows throughout the industry. As NORDEN develops its business to create value in the dry cargo and tanker markets — both challenging sectors with relatively small margins — a strong focus on costs and efficiency is crucial.

Although most email in shipping is used by teams, the software used to process it — such as Outlook or Gmail — is typically designed for individuals. This means that

many professionals spend large amounts of time tagging and filing emails — up to two hours a day in some instances. SEDNA replaces the need to file or archive emails, with instant search functionality, unlimited archiving, programmability and automated tagging.

According to Sture Freudenreich, Head of IT at NORDEN, SEDNA will allow the company to establish new, streamlined processes to manage transactions.

"Switching to SEDNA gives us the chance to re-examine our workflows and potentially save hours every day in team collaboration. The system is in line with our 'Focus & Simplicity' strategy, that will help us unlock valuable resources to develop and grow our business. The SEDNA team's responsiveness and ability to help prepare our users has been invaluable in planning a smooth rollout, which will happen end of August."

Bill Dobie, CEO of SEDNA said: "So often when we're looking for efficiencies in the maritime space we focus on shipboard efficiencies. This ignores inefficiencies hiding in plain sight in the offices of ship owners, brokers, charterers, and traders, where there are potentially hours of time — and consequently millions of dollars — being spent on tasks that only exist because the software we're using is not fit for purpose. However, NORDEN is part of a

growing wave of companies who've realized this, and are taking action."

At NORDEN, SEDNA is used by teams across its Dry Operator, Dry Owner, and Tankers business units along with support functions such as Fuel Efficiency, Technical, and IT.

SEDNA is a proven solution that has already powered over 100 million messages and is being used by some of the leading names in shipping, including Glencore, Seaspan, Sturrock Grindrod and Monson Agencies Australia. The year 2017 also saw SEDNA deliver a 122% increase in its customers and a 186% increase in its contracted ARR (Annual Recurring Revenue).

### ABOUT SEDNA

SEDNA is a transaction management system, purpose-designed for the shipping sector to help teams collaborate with others, organize information, and manage a job from start to finish. SEDNA is a proven solution that has already powered over 100 million email conversations and is used by some of the leading names in shipping, including Glencore, Seaspan, Sturrock Grindrod and Monson Agencies Australia. SEDNA significantly streamlines the transaction management process with a team-based platform that saves time, resources, and money.



*Clockwise (L-R) compose an email in SEDNA, SEDNA search function, SEDNA's dashboard.*

## Diana Shipping Inc. announces time charter contract for 'Semirio' with Pacific Bulk

In August, Diana Shipping Inc., a global shipping company specializing in the ownership of dry bulk vessels, announced that it has entered into a time charter contract with Pacific Bulk Cape Company Limited, Hong Kong, for one of its Capesize dry bulk vessels, the *Semirio*. The gross charter rate is US\$20,050 per day, minus a 5% commission paid to third parties, for a period of minimum ten months to about 12 months. The charter was set to commence on 30 August. The *Semirio* was previously chartered to Koch

Shipping Pte. Ltd., Singapore, at a gross charter rate of US\$14,150 per day, minus a 5% commission paid to third parties. The *Semirio* is a 174,261 dwt Capesize dry bulk vessel built in 2007.

This employment is anticipated to generate approximately US\$6.02 million of gross revenue for the minimum scheduled period of the time charter.

Diana Shipping Inc.'s fleet currently consists of 50 dry bulk vessels (four Newcastlemax, 14 Capesize, five Post-Panamax, five Kamsarmax and 22

Panamax). The combined carrying capacity of the company's fleet is approximately 5.8 million dwt with a weighted average age of 9.0 years.

### ABOUT THE COMPANY

Diana Shipping Inc. is a global provider of shipping transportation services through its ownership of dry bulk vessels. The company's vessels are employed primarily on medium- to long-term time charters and transport a range of dry bulk cargoes.



# The future-proof approach to hard fouling prevention

*Selektope®-based antifouling coating is applied*



Often described as the workhorses of the maritime trade, bulk carriers operate day in, day out, transiting liquid bulk cargoes and the millions of dry bulk commodities traded every day across the oceans of the world. More than eight years have passed since dry bulk freight rates reached a historic low in January 2008, and whilst the dry bulk market has since made strides ahead in its recovery, rates are yet to return to pre-collapse levels.

Enhancing ship efficiency in order to achieve healthier profit margins and maintain commercial buoyancy is imperative for bulker operators. There are many areas in which ship efficiency can be compromised onboard a ship, ship frictional resistance being a major weak spot.

For bulk carriers voyaging in and out of intensifying 'biofouling hotspots' widely

positioned across the globe, the accumulation of biological matter on the ship's hull can add thousands of dollars per day to operating costs which in turn erodes company revenues.

This financial drain is a result of the biological hitch hikers increasing ship frictional resistance, also referred to as hydrodynamic drag, as the vessel moves through water. The added resistance in turn increases fuel consumption as the ship burns more fuel to maintain the same speed. A heavily fouled hull is, of course, extremely impactful on fuel consumption and maintenance costs but even a small amount of fouling may lead to a significant increase in fuel bunkered per voyage.

The impact of bio-fouling on ship performance is greatly dependent on the type and coverage of fouling. Some soft

fouling may be 'washed off' when an idling ship once again becomes active at a certain speed. Soft fouling can also be removed by less impactful hull cleaning practices. Encrusted hard fouling caused by a build-up of barnacles can cause a considerable rise in ship frictional resistance and hard-shelled organisms are a much trickier guest to get rid of. Hard fouling, including barnacle growth, will not be removed when a vessel is travelling at speed. Also, cleaning methods required to remove hard fouling can be more impactful to the coating than those effective for the removal of soft fouling.

Adding to the financial burden of increased fuel use and ensuring continued compliance with tightening restrictions around ship emissions, there is also growing regulatory movement against the

transportation of invasive aquatic species (IAS) by the international shipping fleet and intensified focus from the IMO on IAS transfer via biofouling.

This trio of issues; increasing fuel, emissions and IAS transfer, are forcing operators to place greater importance on selecting antifouling coating products that can cope with any potential biofouling risk encountered. The pressure is on paint manufacturers to formulate antifouling coatings that can guarantee fouling prevention performance regardless of where a ship is trading; in or out of biofouling hotspots, or with any activity; extended static periods or constantly in transit, as influenced by changing market conditions and regulatory pressures.

In the field of antifouling coating development, technological disruption is being driven by market pull. The availability of disruptive technologies such as the anti-barnacle active substance Selektope® developed by Swedish biotech innovator I-Tech AB, is supporting the evolution of biofouling prevention in the paints and coatings sector.

I-Tech's antifouling technology was developed from extensive scientific research that proved the efficacy of an active substance, which at extremely low concentrations, can neurologically scramble a barnacle larva making it hyperactive and preventing it from being able to attach to any coated wetted hard surface. The effects of this neurological scrambling are temporary, with the larvae returning to normal functional capacity shortly after encountering the Selektope® present in the ship's hull coating.

The discovery and subsequent development of Selektope® as a commercial product is completely unique within its application in marine coatings. It has



already revolutionised hard fouling prevention on ship hulls, its uptake catalysed by growing interest from paint manufacturers and ship operators alike.

Due to the powerful effects



demonstrated, this first-of-its-kind coatings technology rapidly caught the attention of coatings suppliers in the early stages of its research and development. The first commercial Selektope®-containing coating products for use on ocean going vessels were launched in the market in 2016 and since then over 200 full applications of Selektope®-containing antifouling coatings have been made on various ship types, a great number of which are bulkers.

Selektope's® impact on spurring technological shift is evidenced by the increasing number of antifouling coating products that contain the active substance being launched on to the market by paint

manufacturers. These new products offer a much-needed remedy for hard fouling prevention. In addition to the range of Selektope®-containing antifoulings currently available, new antifouling coatings are

constantly being developed by the major paint manufacturers that contain Selektope® due to its well-reputed ability to deliver guaranteed hard fouling prevention performance. "I-Tech has welcomed the continuous launch of new products onto the market each year. The increasing diversification in the range

of Selektope®-containing products available to ship owners suitable for different vessel requirements demonstrates the unrivalled versatility of the antifouling ingredient. It also demonstrates a growing commitment to the technology as demand from ship owners for antifouling coatings comprising Selektope® intensifies." says Philip Chaabane, CEO I-Tech AB.

With global water temperatures having already warmed by 1–2°C, and with further intensification of biofouling hotspots anticipated, the requirement for more effective hard fouling control will only increase in the future. When looking at the future trading potential, bulker operators need to ensure that their ship is protected from hard fouling whether it be in constant active service, idle for long periods of time, or at risk of fluctuating between the two. This future-proofing approach to antifouling coating selection, without any certainty of future trade, is exerting great pressure on the coatings suppliers, prospering great innovation in the development of antifouling coatings. Those antifouling coatings inclusive of Selektope® have the potential to offer enhanced protection against hard fouling making them ideal contenders for future-proofing existing and new build bulk carriers against biofouling risk.

*Philip Chaabane, CEO I-Tech AB.*



# The transshipment revolution

## overcoming infrastructure limitations



Jay Venter

## Transshipment by PT Asian Bulk Logistics

PT Asian Bulk Logistics (ABL), is a Jakarta-based integrated logistics and transportation service provider for the mining and commodities industry with a large presence in East Kalimantan. Established in Jakarta in 2010 by Italian Group Coeclerici, ABL is fully owned and managed in Indonesia.

As a ship owner and operator, the company is endeavouring to provide comprehensive logistics support to primarily the mining industry in Indonesia with aspirations of growing to be a global player in dry bulk cargo movement by sea.

Since its initial establishment, ABL has been mostly focused on the transshipment of coal from barges into ocean going vessels; building, owning and operating

cargo transfer ships (CTS) designed with a sophisticated cargo handling system made by cranes, conveyors and shiploaders, and serving some of the bigger and most reputable coal mines and traders in the Indonesian market.

Having the capability of maintaining a net loading rate of up to almost 50,000 tonnes per day, these CTS have handled more than 90mt (million tonnes) of coal since 2011.

Transshipment plays a key role in the transport of coal and other commodities from loading jetties to mother vessels, especially in countries like Indonesia, where there is poor infrastructure and ports may not have adequate draught or equipment to manage the loading and unloading of large

quantities of coal.

Generally, companies develop dedicated haul roads from mines to river loading facilities, and in some cases railways. From those loading facilities coal is usually loaded into barges, which may vary in size from 3,000 to 12,000dwt, usually towed by tugboats from the river loading port to the Transshipment point or directly to the customer.

### KEY BENEFITS AND ADVANTAGES OF TRANSSHIPMENT

- ❖ lower capital and operating expenses;
- ❖ barges, cargo transfer ship or transshipper are an OPEX, so it is an advantage to have re-deployable assets;
- ❖ ability to load larger vessels and to



extend market reach, solving the problems of port draught restrictions; and

- ❖ reduced environmental impact.

In Indonesia there are about 80 transshippers, owned by approximately 30 different companies, which support mostly the coal business and its current production and export of more than 400mt per year.

This means the transshipment market in Indonesia is very fragmented, with major coal mining companies controlling, directly or indirectly, their own transshipment companies.

Sixty per cent of transshippers are conventional floating cranes, while the remaining 40% are floating loading facilities (such as ABL cargo transfer ships), having the advantage of higher performances and loading rate and being also equipped with metal detectors and sampling system. Some floating loading facilities also have the capability of performing blending between two different qualities of cargo, discharging two barges simultaneously in double banking and allowing shippers to blend different qualities of cargo and meet buyers' requirements.

The transshipment industry in Indonesia experienced a boom during ten years

between 2005 and 2015 when many companies, sometimes not even directly involved in the coal industry, invested funds on new buildings.

However, after the 'golden years' and following the drop of coal prices during 2015, new transshippers buildings have stopped and only one newbuild has been registered in Indonesia during the last three years.

In view of that, the current fleet is generally quite old and might require some newer and higher-performing units to support increases in production in the next few years, especially for major mining companies and groups.

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## Konecranes Gottwald floating cranes to be delivered to Guinea

As reported in the June issue of *Dry Cargo International*, Konecranes has won another order for two Konecranes Gottwald floating cranes. The order was placed by Winning Logistics Company Limited in the first quarter of 2018. With these new cranes, Winning has ordered eight such cranes in a short time.

The new order follows an order placed with Konecranes only last autumn. The floating cranes contribute to the continuing growth of Winning's bauxite handling activities off the coast of Guinea, Africa. They play a key role in the supply chain, transshipping bauxite from river barges to Capesize vessels on the open sea.

Wang Chuanyang, Vice President, Winning Logistics explains: "Our existing cranes have proven themselves to be particularly productive and reliable in the very rough open-sea environment. This is why we have opted time and again for floating cranes from Konecranes."

Giuseppe Di Lisa, Sales and Marketing Director, Mobile Harbor Cranes, Konecranes Port Solutions, says: "Konecranes Gottwald floating cranes are derived from our mobile harbour crane technology and highlight our pioneering

role in this field. The first floating cranes went into operation on the Mississippi River in 2004. Thereafter, they quickly found their way to the open sea. Winning's decision to continue to rely on Konecranes Gottwald floating cranes confirms Konecranes' leading role in this segment."

Built for use on the open sea, the Model 8 floating cranes with a maximum outreach of 43m and a powerful 63t grab curve are designed in accordance with Lloyd's Register Code for Lifting Appliances in a Marine Environment. This allows them to operate at wind speeds of up to 24m/s and at maximum wave heights of 2.5m.

### KONECRANES FLOATING CRANES HELP BRIDGE THE INFRASTRUCTURE GAP

Konecranes Gottwald floating cranes come into their own in harbours or waterways with limited quay facilities or none at all, and where quay capacities are exhausted. Based on well-proven Konecranes Gottwald mobile harbour crane technology, they can be used on a floating barge:

- ❖ on rivers;
- ❖ in ports;
- ❖ in sheltered waters;
- ❖ in coastal waters; and

- ❖ in open-sea operation.

A number of variants are available:

- ❖ Configured as a harbour pontoon crane:
  - ❑ variant as a barge with a pedestal on which the crane is mounted
  - ❑ variant as a barge with rails on which the crane can be moved;
  - ❑ allows multiple hatches without warping the barge.

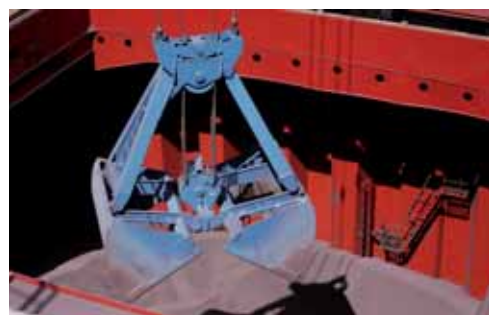
### ONE BARGE, MANY BENEFITS

- ❑ independent of landside handling facilities;
- ❑ low specific investment costs;
- ❑ short delivery lead times;
- ❑ avoids lengthy approval procedures;
- ❑ no need for costly purchase of additional land or construction of new quays;
- ❑ more, larger vessels can be serviced in the port;
- ❑ quay facilities unnecessary for direct transshipment between seagoing ship and barge; and
- ❑ when additional capacity is required, floating cranes can supplement land-based handling.



*Konecranes Gottwald floating crane off the coast of Africa handling bauxite.*

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## LDPL – in partnership with Abu Dhabi Ports – signs an agreement with EGA for bauxite transshipment in Guinea

Emirates Global Aluminium, the largest industrial company in the United Arab Emirates outside oil and gas, on 29 April 2018, signed a 15-year agreement with LD Ports & Logistics, a subsidiary of Louis Dreyfus Armateurs, for the transshipment of bauxite in the Republic of Guinea.

Louis Dreyfus Armateurs and Abu Dhabi Ports separately signed an undertaking to form a joint venture company to work together to implement the project.

Transshipment is the process of moving cargo from one vessel to another at sea, and is used to transfer cargo when vessels are too big to berth in a port. Using larger ships reduces shipping costs on longer journeys.

EGA will be loading bauxite at the port of Kamsar in Guinea from both its own Guinea Alumina Corporation project, which will supply customers around the world, and from Compagnie des Bauxites de Guinée for supply to EGA's Al Taweelah alumina refinery in Abu Dhabi.

Kamsar is located on the river Nunez some 17 kilometres from the open sea and is inaccessible for the world's largest vessels.

Louis Dreyfus Armateurs is a global marine transport and services group.

EGA already works with Abu Dhabi Ports in Guinea. Abu Dhabi Ports manages a container terminal built by EGA at Kamsar port.

Speaking at the signing ceremony,

Abdulla Kalban, EGA's Managing Director and Chief Executive Officer, said: "EGA has set an ambitious growth agenda to expand upstream and internationally. Transshipment is an important link in the chain that will connect our alumina refinery and aluminium smelters in the UAE with bauxite mines in Guinea, and will also lower shipping costs from GAC to global bauxite markets."

Gildas Maire, Chief Executive Officer of Louis Dreyfus Armateurs said: "These agreements with EGA and Abu Dhabi Ports expand our geographic and operational footprint in West Africa. We are pleased to be partnering with these UAE leading companies, and to play a part in the development of Guinea's economy by helping to enable the competitive transport of Guinean bauxite."

EGA is currently developing the GAC project in Guinea, a bauxite mine and associated export facilities. First bauxite from the project is expected during the second half of 2019. The GAC project is one of the largest greenfield investments in Guinea in the past 40 years, and will be a new global source of bauxite supply. Bauxite is the ore from which aluminium is derived.

EGA is also building the UAE's first alumina refinery at Al Taweelah in Abu Dhabi. First alumina is expected during the first half of 2019. Alumina, which is refined from bauxite, is the feedstock for aluminium smelters. Al Taweelah alumina



refinery is expected to meet 40% of EGA's alumina needs once full ramp-up is achieved.

The transshipment system for GAC will consist of self-propelled barges that will shuttle from the GAC berth at Kamsar port to two floating transfer stations. For bauxite destined for Al Taweelah alumina refinery, LD Ports & Logistics will use a gearless Panamax that will shuttle from the Compagnie des Bauxites de Guinée berth to a transshipper.

Bauxite for Al Taweelah alumina refinery will be unloaded at Khalifa Port in Abu Dhabi. In December, EGA and Abu Dhabi Ports signed a long-term port facility agreement which enables Abu Dhabi Ports to develop Khalifa Port to become the first in the Gulf capable of directly handling the world's largest bulk cargo vessels.

Abu Dhabi Ports will fund and complete dredging and widening works to the Khalifa Port approach channel and basin including EGA's berth.

## Transship Bulk transitions to ISO 9001:2015

### TRANSITION TO ISO 9001:2015

Transship Bulk recently announced that it has completed upgrade of the quality management system to the new edition of the ISO 9001 standard 2015 version.

The company's compliance for quality management of the bulk carrier operations was successfully verified and confirmed by the ABS Quality Evaluations, Inc., an independent, accredited, third party registrar.

Consistently meeting requirements and addressing future needs and expectations poses a challenge for the company in an increasingly dynamic and complex environment. To achieve this objective, Transship Bulk adopted revised quality standard and particularly focused on risk-based thinking to be more efficient and

improve customer satisfaction.

### ABOUT TRANSSHIP BULK

Transship Bulk is a part of Transship Ltd group of companies, engaged in maritime shipping activity, mainly as commercial and technical managers of the dry cargo ships.

Transship Bulk has been set up as an 'in-house' ship management department which embodies qualified initiative professionals, possessing excellent and strong communication and interpersonal skills, capable to operate within a team and confident when required to work individually. 'In-house' ship management enables the company to enjoy the full benefits of close co-operation between all the departments, time and cost-effective collaboration and perfect environment for



*The Zina.  
(Photo © Martin McKenna, MarineTraffic.com)*

effective operation of the ships.

### FLEET

Currently, the company operates two new-built handy-sized bulkers, *Zina* and *Floriana*, on a worldwide basis with future prospects to expand the fleet.

The company's vessels transport bulk commodities including iron ore, coal, grain products, sugar, fertilizers and steel products.





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## Shi.E.L.D. Services takes over the logistics of Coeclerici

A newly established Italian company, managed by Corrado Cuccurullo, has taken over the management of the vessels recently sold by Coeclerici and is now working towards also expanding its activities to the onshore sector.

Not only Cuccurullo, former Chief Operating Officer of Coeclerici Logistics, but most of the technical and operating team of Coeclerici Logistics, are now working for Shi.E.L.D. Services, based in Milan (with an office also in Jakarta), which took over the technical management of the vessels recently sold by the Italian Group managed by Paolo Clerici.

Seven of the team components, mostly naval architects and engineers, are based in Milan, one in China and two in Indonesia, which is where the company is particularly strong given its previous experience.

Thanks to the expertise acquired during the years under Coeclerici Logistics, Shi.E.L.D. Services, which is actually a spin-off of the former, could easily take the management of seven units specialized in the offshore transshipment of dry bulk materials. Among these are the two transshippers *Bulk Zambesi* and *Bulk Limpopo* which had been employed by Vale Moçambique for the transshipment of coal in Mozambique.

The other five units managed by Shi.E.L.D. Services are based in Indonesia, four of them owned by PT.Asian Bulk Logistics, the fifth one owned by PT.Transcoal Pacific.

Besides the ship technical management Shi.E.L.D. Services has also started providing consulting services (for the Italian



*Shi.E.L.D. Services is managed by the former COO of Coeclerici Logistics, Corrado Cuccurullo.*

company Intergen and for Louis Dreyfus Armateurs) but, Cuccurullo explains, although now focused on the offshore logistics of dry bulk materials, the company wants to extend its range of activities also to onshore handling (in this case, opportunities should come from Indonesia) and to the design of cargo handling systems and equipment, which is another strong competence acquired during the years in Coeclerici.

"2018 has been a good year for Shi.E.L.D. Services and the forecasts for 2019 are also good. Of course we hope to add more clients and orders to our portfolio," Cuccurullo says.

Regarding the market outlook he adds "I'm optimistic about the opportunities that can be presented to our company because I believe that it would be more convenient for some operators, especially for those who own up to four vessels, to outsource the technical management compared to the in-house solution as this would result in an optimization of costs and performance."

### INVALUABLE EXPERIENCE

During their time in Coeclerici the members of the Shi.E.L.D. Services team have successfully managed many logistics projects. The following ones are the most representative because of the complexity and the performances obtained:

- ❖ in South America, transshipping coal with a specially designed crane vessel permanently anchored in the Maracaibo lake in Venezuela; it used to load ships with coal for a Venezuelan state owned mine company;
- ❖ in Africa, with one of the most complex off-shore logistics & shipping projects in the world, consisting of two tailor-made Supramax vessels fitted with a cargo handling system, loaded at the port with coal which would sail to an offshore location where they would transship the cargo into the oceangoing vessels (OGVs) anchored 25nm off the coast;
- ❖ in Indonesia, with five floating terminals transshipping coal;
- ❖ in Italy, lightering iron ore from OGV for the biggest Italian steel mill; and
- ❖ in Russia, first of a kind in the world, transshipping sulphur in the Black Sea.



*The Bulk Java is one of the transshippers whose technical management has taken over from Coeclerici by the newly formed Shi.E.L.D. Services.*



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*Photo by courtesy of Coeclerici.*

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## First ever S-T-S loading of 70,000dwt Panamax coal carrier performed at Shakhtersk harbour transshipment location in Sakhalin



A 70,000dwt dry bulk carrier is shown being loaded ship-to-ship at the roadstead in Sakhalin based port of Shakhtersk in Russia. This is the first Panamax coal carrier ever handled at the Skakhtersk offshore transshipment station. The vessel will transport the coal cargo to China. The port expects soon the arrival of yet another coal carrier of larger tonnage, Eastern Mining Company (EMC) said.

EMC has expanded its export capabilities thanks to the Emso-I for STS transshipment facility equipped with a shiploader with a capacity of 2,500tph (tonnes per hour), a conveyor and a pair of grab cranes.

The ship has been operating at the Shakhtersk harbour transshipment location since the end of May 2018.

The Shakhtersk Coal Terminal owned by Eastern Mining Company (Coal Seaport Shakhtersk) for several years shows sustained coal shipments growth, which is attributed largely to the EMC's investments in its assets, the press release said. In June, coal port of Shakhtersk handled its record volume, 1.1mt (million tonnes) of coal.

EMC also beefed up its ship-to-ship transshipment fleet adding eight more ships last year. The mooring reloading complex was overhauled: one outdated loading machine was replaced with three new ones. The company constructed

3.1km-long conveyor lines to avoid delays in delivering coal cargoes to the harbour transshipment stations.

EMC says upgrade of the terminal enabled to increase coal shipments in 2017 to 4.6mt with outlook of 8mt mark in 2018.

The coal mining development project in the Ulegorsk District is comprehensive and is not limited to machinery and equipment upgrade. Eastern Mining Company is currently completing the construction of border crossing point office at the port of Shakhtersk. The shipment of export coal cargo is accompanied by customs clearance procedure. As of today, before loading and departure, coal carriers have to enter the Port of Kholmsk for customs clearance, which causes delays of up to three days. Once completed, the border crossing/customs clearance checkpoint office the delays and costs will be reduced to a minimum.

The Coal Sea Port of Shakhtersk LLC is the major coal terminal in the region. The company operates specialized reloading machines and 2,000tph vessel-loading machine. The company's port fleet consists of 1,700dwt and 3,500dwt dry-cargo vessels and tugboats. The terminal carries



out ship-to-ship transshipment of coal at the harbour anchorage location, loading 60,000dwt bulkers. The terminal handles coal from the Solntsevskiy coal deposit and from the Udarnovskaya coalmine.

East Mining Company Ltd. is the major coal producer in Sakhalin region coordinating the activities of Solntsevskiy Coal Mine LLC and Coal Sea Port of Shakhtersk LLC. The company implements an investment project to increase production and shipment of coal in the Sakhalin region to 12mt per year. In March 2018, a EMC's subsidiary EMC Transport Systems became a resident of the Free Port of Vladivostok and intends to build by 2022 a 28km-long conveyor line for coal supply from the Solntsevsky coal mine to Shakhtersk coal terminal.

# Bulker services

safety and efficiency at sea



*Nickel ore can liquefy in the hold, and has been the cause of many fatalities.*

**A**s Indonesia heads into its annual wet season, the safety of seafarers on bulk carriers will become more precarious, writes Mike King.

Indonesia's wet season generally falls October to March/April, reinvigorating the archipelago's amazingly diverse flora and fauna and giving its farming sector a major boost. However, the annual monsoons also cause supply chain obstacles for dry bulk exporters as poorly constructed roads turn to sludge. While the lack of transport infrastructure and dependable roads and railways hurts earnings, it is the lack of port storage and transport cover that is of danger to seafarers.

Some mineral cargoes shipped in bulk can liquefy if they contain too much moisture. This problem usually occurs when the cargo is mined and/or stored in conditions which enable the absorption of large amounts of water. This creates the conditions under which cargo liquefaction — the process by which some bulk cargoes turn into liquid — can occur at sea, a

process that can result in the vessel rapidly capsizing as it is destabilised as the cargo slushes around in the hold.

This has been an ongoing problem in Indonesia and has resulted in a huge number of preventable deaths. All occurred after the loading of nickel ore destined for China during the wet season.

For context, 53 bulk carriers over 10,000dwt were lost over the period 2008–2017 resulting in the deaths of 202 seafarers, according to Intercargo, the International Association of Dry Cargo Shipowners. Of this total, 81 seafarers lost their lives after loading nickel ore in Indonesia between 2010 and 2013 after the vessels destabilized following liquefaction of the cargo.

The losses over the 2010–13 period included the Panama-registered, 1983-built handymax *Harita Bauxite* which sank on 17 February 2013 after loading nickel ore in Obo, Indonesia. The vessel was headed to Ningbo, China. Ten sailors from Myanmar were rescued one of whom subsequently died. Fourteen were assumed to have

drowned in heavy seas.

Prior to that on December 2011 the Vietnam-flagged *Vinalines Queen*, a 2005-built Supramax bulk carrier carrying 54,400 tonnes of nickel ore from Morowali port in Sulawesi to China, developed a list North East of Luzon Island in the Philippines. Only one of the 23 seafarers on board escaped with his life.

And in 2010 came three additional tragedies. On 3 December, the *Hong Wei* sank after loading nickel ore in Indonesia — ten of the crew died. On 27 October the *Jian Fu Star* sank with the loss of 13 lives after loading nickel ore in Indonesia. And on 10 November 2010 the *Nasco Diamond* suffered 21 fatalities on 10 November, again, after loading nickel in Indonesia.

Indonesia banned the export of unrefined nickel ore in 2014 in a bid to force miners to process more cargo in-country. The collapse in Indonesian nickel exports saw global liquefaction deaths at sea plummet.

But in 2017 Indonesia resumed exports of nickel and, predictably, the deaths

## 'Cheshire' report welcomed

As reported in *DCI* earlier this year, one of the problems facing the bulk carrier sector's efforts to improve safety has been the failure of Flag States to complete and make public investigations into casualties. The IMO's mandatory Casualty Investigation Code does not give a specific timeline but refers to "as quickly as possible" and "as soon as is reasonably practicable" in terms of completing a marine safety investigation report after a casualty.

However, as Intercargo notes, this is not happening. The IMO GISIS database of casualties at the end of January 2018 recorded that 29 investigation reports into 53 bulk carrier losses over 2008–2017 had not been submitted to IMO by their respective Flag States.

It was against this background that Intercargo recently welcomed the "Cheshire Casualty Investigation Report".

In August 2017, the 2012-built supramax bulk carrier *CHESHIRE* was on route from Norway to Thailand, fully loaded with cargo declared by the shipper as "Ammonium Nitrate Based Fertilizer (Non-hazardous)" and therefore not liable to self-sustaining decomposition.

However, according to the report, it suffered cargo decomposition that led to



### *CHESHIRE*."

The report recommended amending the misleading cargo name from "Ammonium Nitrate Based Fertilizer (non-hazardous)" to "Ammonium Nitrate Based Fertilizer (not otherwise classified)". It also suggested that fertilizer manufacturer

provide further information on the behaviour and carriage of this cargo, and consideration of whether the current IMO-stipulated test for assessment of self-sustaining decomposition properties of an ammonium nitrate-based fertilizer was adequate.

Ammonium Nitrate Based Fertilizer (non-hazardous) is currently designated in the IMSBC Code as a group C cargo. These are cargoes that do not liquefy (group A) nor possess chemical hazards (group B).

"It is clear from this incident that this cargo, or at least some of the ammonium nitrate based fertilizers shipped as this cargo, should not be treated as group C," said Intercargo.

"It is Intercargo's hope that future work at the IMO will lead to the correct designation and description of this cargo within the IMSBC Code, thus furthering the safer carriage of cargoes and safer voyages."

rising temperatures in the cargo holds and the generation of toxic gases. The decomposition progressed throughout the length of the vessel to such an extent that, after several days, the vessel's Master took the decision to evacuate the crew.

The vessel was then left to drift under the supervision of the Spanish Authorities until being salvaged, but in the end, due to extensive damage, the vessel was declared a constructive total loss.

"The importance of investigating an incident and the subsequent publication of a casualty report cannot be overstated, as identifying the causes of accidents enables corrective actions to be put in place," said Intercargo.

"Intercargo would like to commend the Isle of Man Ship Registry, the Flag Administration of the vessel, for the timely publication and the clarity of the Casualty Investigation Report of the

returned. In October last year – the start of the very first wet season since the nickel export ban was rescinded – saw the loss of the *Emerald Star* and the deaths of ten crew. The vessel had loaded nickel ore at Buli in Indonesia for delivery to China.

Since then Indonesia's exports of nickel ore have soared and even higher volumes are expected to be loaded this wet season, exacerbating the dangers. Moreover, Indonesia is also upping exports of bauxite which, like nickel ore, was subject to an export ban until early 2017. Bauxite is another major liquefaction risk, illustrated tragically with the loss of the *Bulk Jupiter* and 18 crew after loading the cargo at the port of Kuantan in Malaysia in 2015.

Indonesia exported 8,637,595 tonnes of nickel ore in the financial year ended March 31, 2018, while bauxite exports reached

2,634,455 tonnes over the same period. However, exports are expected to surge in the current financial year and through the upcoming wet season — as of March 31, Indonesia's mining ministry had issued quotas for a total of 32,266,315 tonnes of nickel ore exports and 17,127,400 tonnes of bauxite exports.

Researchers predict that as Indonesia reclaims its share of the lucrative Chinese nickel ore and bauxite export markets it previously chose to vacate, volumes will spiral. BMI forecasts that exports of bauxite will register an annual average growth rate of 24.4% per annum during 2018–2027. "We expect output to increase from 7.5mt [million tonnes] in 2018 to 43.3mt by 2027," concluded the report.

SMM, meanwhile, expects Indonesia's exports of nickel ore to China this year

surpass 22mt.

Preventing liquefaction is relatively straightforward in theory. Liquefaction is a chemical process that turns a previously safe commodity into a cargo with a dangerously high moisture content (MC). This can quickly destabilize a vessel. Liquefaction happens because some granular materials including nickel ore have void spaces caused by irregular particle shape which can fill with air and/or water. If cargo laden with moisture this way is carried at sea, cargo particles compress the void spaces and pressurise any free water present in the spaces. The moisture released from the mineral structure of some types of cargo increases the amount of free water in the cargo and can lead to a further increase in the pore water pressure.

If the pore water pressure is high, it can overcome the friction forces binding the individual particles of material and the shear strength of the cargo falls to the point where liquefaction occurs. The bulk cargo then becomes a viscous fluid with flow ability. The consequence is the rapid loss of vessel stability due to the movement of liquefied cargo.

The International Maritime Safety Bulk Cargo (IMSBC) Code provides guidance on the standards to be applied to prevent liquefaction. The two key points are the determination of the Transportable Moisture Limit (TML), which is the responsibility of the shipper, and the determination of the actual moisture content of individual shipments. If the actual moisture content portion of a representative cargo sample consisting of water, ice or other liquid expressed as a percentage of the total wet mass of that sample is higher than the TML, the cargo should not be loaded onto a vessel.

The IMO recommends that independent auditors should provide test analysis certificates before loading cargoes that can liquefy, and that visual inspections and complementary tests can be conducted

by crew before loading to determine moisture levels of the cargo. However, as previously reported in *DCI*, in Indonesia a lack of oversight from maritime and port authorities, the absence of reliable law enforcement in many smaller load ports, and pressure from ship operators and shippers on crew and master, have prevented the correct procedures from being followed.

A number of maritime authorities contacted by *DCI* refused to comment on the specific dangers facing seafarers manning bulk carriers in the coming Indonesian wet season, although many emphasised that stakeholders in the trade should take the utmost care.

“Cargoes that are liable to liquefaction are well known to us and categorized as Group A cargoes under the IMSBC Code,” said a spokesman for the Association of Bulk Terminal Operators. “We all have a responsibility to ensure that the Transportable Moisture Limit (TML) is not exceeded when loading these cargoes. The loss of the Bulk Jupiter illustrates the need for great care, particularly when adverse weather conditions occur.”

A spokesperson for the International

Union of Maritime Insurance (IUMI) said the main cause of casualties and near misses due to liquefaction was the poor compliance of shippers with the testing and certification requirements that were designed to ensure that cargoes were loaded only if the moisture content was sufficiently low to avoid liquefaction occurring during the voyage.

“In reference to Indonesia, there have been problems with shipments of nickel ore, particularly if loaded during their wet season, which runs from October to April,” he said. “The heavy rain will undoubtedly increase moisture levels during loading. The result is cargoes being shipped with a moisture content above its Transportable Moisture Limit, leading to cargo failure — liquefaction/dynamic separation.

“In order to avoid saturation, loading should not take place during periods of rainfall in order to minimize saturation. In reference to Indonesia, I understand that there was a case of misdeclaration of nickel ore as iron ore, resulting in P&I Clubs reminding their members ‘to be especially cautious when accepting cargoes from Indonesia in the region during the wet season and times of heavy rainfall.’” [DCI](#)



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## Perfecting the pit-stop with coatings from Hempel



When it comes to vessel maintenance and maximizing operational efficiencies, the accepted wisdom is that it is usually best to take the “it’s a marathon not a sprint” approach, writes *Davide Ippolito, Group Project Manager, Marine, Hempel A/S.*

It is important to consider the time, energy or money saved over the longer-term to optimize performance over the longest possible time. Investment in the right tools, equipment, processes or routines to enhance the operational capability of a vessel over its lifetime while reducing the burden on the physical structure of a ship, then, makes sense. Whether its choosing to install the most powerful engine, equipping the vessel with trim optimizing propeller systems or advanced hull coatings that ensure it can move with speed precision or agility, there are numerous ways to improve vessel performance.

Considering the longer-term health of a vessel makes obvious business sense. Shipowners and operators must also recognize the cumulative benefits of ensuring that turnaround times in port, periods of maintenance and routine cleaning and inspection are made as efficient and cost effective as possible.

After all, any endurance athlete who cannot perfect a speedy kit-change or swift turnaround will always be at a disadvantage to the competition, regardless of their strength, speed or pace.

When it comes to dry bulk vessels, the time taken to clean, inspect and maintain cargo holds is the supply chain equivalent to the Formula One pit-stop, or the passing of a baton in a relay race: get it wrong, and it is effectively ‘game over’. For this reason, investing in cargo hold coating solutions that make it easier to clean holds, protect against damages and corrosion, and that are designed to minimize out-of-service time is a winning strategy.

### PLAYING BY THE RULES

Cargo hold coatings play a critical role in ensuring the safe shipment of dry bulk cargoes. Thanks to new developments in coating technologies, it is now possible to apply a cargo hold coating that delivers significant savings — from faster return-to-service and cleaning time.

Hempel’s Hempadur Ultra-Strength Fibre 47510 has been specifically developed to protect cargo holds, hatch covers and hatch coamings of dry bulk carriers. This hold coating incorporates a

unique combination of superior mechanical resistance with a fibre and self-toughening technology to provide the most robust and reliable cargo protection for cargo holds in the market today. Importantly, the heavy-duty nature of the coating provides superior resistance to abrasion, impact, cracking and chemical attack, combined with an easy-to-clean smooth surface. These are all critical features to ensure easy cleaning between cargoes and fast inspection in port.

The patented fibre technology used in the coating also provides significant flexibility — it is compatible with the full range of dry bulk cargoes, including grain — and its self-toughening properties are activated by cargo heat, boosting the mechanical, chemical and thermal resistance of the coating over its service life. This provides both efficiency and operational gains for dry bulk shipowners and operators subject to an often-unpredictable spot-market and ever-changing customer demand requirements.

### ENSURING COMPETITIVE ADVANTAGE

The benefits of applying a protective coating specially designed to resist the harsh environment of a cargo hold are





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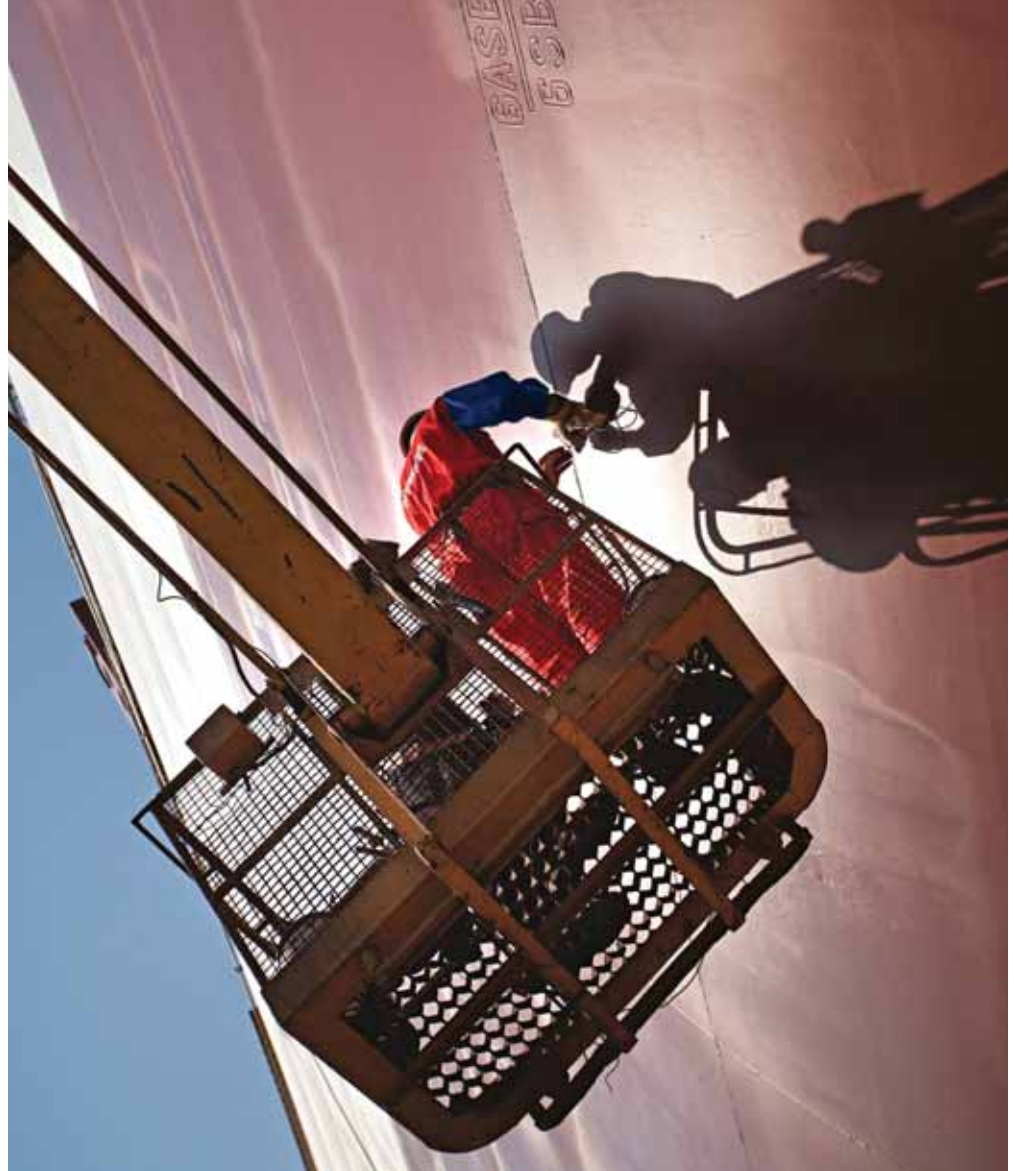
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significant and tangible. Hempadur Ultra-Strength Fibre 47510 provides up to 40% reduction in maintenance costs compared to standard epoxy coatings, which have traditionally been applied to bulker holds.

For real operational efficiency, cargo hold coatings should eliminate contamination between cargoes and be easy to clean — so operators can reduce turnaround times and quickly switch between consignments as the market demands; and they should be fast-curing, to ensure a fast return to service during maintenance. Hempadur Ultra-Strength Fibre 47510 requires just three days before carrying the first hard cargo. Add to this a ten-year maintenance major repair interval, and you are moving in the fast lane.

#### PLAYING TO YOUR STRENGTHS

In a bid to ensure the highest levels of safety, efficiency and environmental protection, the



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shipping industry on the whole has been increasingly proactive in developing solutions that make a tangible difference to our ability to operate to our full potential. This means doing all that we can to ensure that we enhance our assets, utilise the latest evidence and technology to improve how we perform, and to protect vessels against the harsh conditions that they endure.

Ensuring the right coatings are applied to external and internal structures is an integral part of this overall programme of improvement. Armed with the right equipment and mentality towards managing both long- and short-term operational gains, dry bulk shipowners' and operators can see a marked improvement in their operating costs and capabilities. In an increasingly competitive operating environment, and in light of sustained market pressures, the shipowner benefitting from the significant savings made from selecting the right protective solutions could very well make it over the line ahead of the rest.

## Gibdock completes complex ballast water treatment system retrofit

*Gibdock has just completed a complex ballast water treatment system retrofit onboard the 179m, 34,500dwt bulk carrier Zambesi.*



Now that the IMO's Ballast Water Management Convention has entered into force, more shipowners than ever before are actively looking at the installation of ballast water treatment systems onboard their vessels. Gibraltar-based Gibdock has the skills and capabilities, and favourable geographic location, needed to undertake such work efficiently, with minimum vessel downtime periods, during routine drydocking stays. Consequently, the yard has actively geared up to meet increased shipowner demand for high quality ballast water treatment system retrofits and is in active discussions with several potential clients.

Underlining its capabilities in this field, Gibdock has just completed a complex ballast water treatment system retrofit onboard the 179m, 34,500dwt bulk carrier *Zambesi*. The 2013-built, DNV GL classed vessel, owned by Hamburg-based John T. Essberger, arrived in Gibraltar on 4 June this year for a month-long programme of works.

The vessel departed the yard on 5 July with its new ballast water treatment installed and ready for commissioning, having spent 16 days in Gibdock's No. 1 Drydock, and the rest of the time

alongside.

Gibdock technicians carried out all the necessary pipework and preparations onboard, before assembling and installing the owner-supplied UV-type ballast water treatment system. The yard worked closely on this project with Aries Marine, a UAE-based specialist in ballast water treatment retrofit engineering, which supervised this element of the drydocking schedule.

Shiprepair manager, Juan Piñero, says, "This was a complex retrofit, and our engineering staff and pipefitting team rose to the challenge magnificently and completed the works to the client's complete satisfaction. With this project we have gained further valuable experience in ballast water treatment retrofits, which will hold us in good stead for the future, as a growing number of owners look to carry out this type of work to meet IMO requirements."

Alongside the ballast water treatment retrofit, Gibdock carried out a wide range of repair and maintenance items on *Zambesi*. This included a total of 2,500m<sup>2</sup> of blasting and painting on the vessel's topside and underwater hull areas. The yard also carried out some cargo hold

treatments, that involved spot blasting in way of the coamings and upper hoppers.

Mechanical works carried out on *Zambesi* included the removal and refitting of the ship's propeller, bonding of seals and the removal of the tailshaft and intermediate shaft. Piñero, says, "This was a very demanding operation as it involved working in a very narrow space. Through careful preparation and planning, our engineers were able to carry out the necessary works successfully within the timescale required."

Other elements of the scope of work included overhauling the ship's main engines; ultrasound cleaning of the air coolers; the removal of the windlass for maintenance work in the workshop; overhauling the ship's mooring winch and sea valves; and carrying out steel repairs in the ballast water tank area.

The John T. Essberger Dry Cargo Division operates a fleet that includes self-trimming bulk carriers as well as both geared and gearless container vessels. Gibdock has in recent years achieved considerable success in securing shiprepair work from German ship owners, and the *Zambesi* contract continues that strong track record.

# ClassNK adds to RIMS portfolio of class approvals for the use of drones in enclosed spaces

RIMS (Robotics In Maintenance Strategies) continues in its quest in the practical integration of drone technology in the world maritime surveying with yet another class society approval for the use of Remote Inspection Techniques (drones) during surveys of enclosed spaces, this time from ClassNK.

## CLASS APPROVALS

Over the past 12 months RIMS has successfully secured class approvals from multiple societies; Bureau Veritas, Lloyd's



Register, ABS, RINA, KRS and now ClassNK.

The certification for the use of Remote Inspection Techniques (drones) during surveys of enclosed spaces, from these classification societies opens the option of drone use to more shipowners and managers for inspections.

The use of drones during surveys enables remote live on-screen object inspection, which can result in the elimination of the use of costly access equipment such as scaffolding and cherry pickers. The technology used in this way in turn then offers additional substantial benefits to shipowners and managers such as; reduction in the time to carry out a survey, minimising of risk, as well as cost savings.

David Knukkel, CEO, RIMS said; "We want to ensure we can offer our services as an option to

all, and we shall continue to put our efforts into obtaining further class approval to ensure this is the case.

"Our journey and the future of the technology is looking promising and we are really seeing a positive shift which these class approvals only enhance further. The benefits of the drone technology are vast, and we will continue in our mission to demonstrate what these benefits are to the maritime industry."

## ABOUT RIMS

RIMS is a global project and maintenance consultancy to help revolutionize maintenance strategies with smart drones and robotic. RIMS' high tech expertise in combination with smart asset management solutions mean customers benefit from much safer, more sustainable and cost-efficient surveying and maintenance solutions. RIMS has successfully achieved class approval with; ABS, ClassNK, Bureau Veritas, Korean Register, Lloyd's Register and RINA.

## Coldharbour Marine offers clear BWTS choice for big bulkers

Owners and operators of big bulk carriers face challenging decisions in the months ahead as IMO regulations on ballast water treatment and low-sulphur fuels begin to change ship operating economics, particularly in the case of vessels usually deployed on long-haul voyages.

Rates for large vessels in the dry bulk market are significantly stronger this year than last, but the new rules will bring some 15 year-old or older ships to a fork in the road. The cost of ballast water treatment systems plus scrubbers could be \$4–6 million for no apparent payback: some owners may prefer to scrap. Clarkson indicates that around 160 bulk carriers of 120,000dwt or more are more than 15 years of age.

Overall, however, the analyst identifies 1,570 bulk carriers of 120,000dwt or more as eligible for ballast water treatment installations over the next five years or so, a reality that is bringing the main part of the market to the point of commitment on its system preferences.

In a crowded field of ballast water management system suppliers, owners of larger bulk carriers are advised to prefer bespoke technology over general purpose systems that suffer performance limitations at larger capacities, according to Coldharbour Marine Chief Executive Andrew Marshall. The boss of the UK-based company has developed a unique system based on inert gas technology specifically for large vessels including bulk carriers, very large ore carriers, tankers and LNG carriers.

“There is no one-size-fits-all,” says Marshall. “There is no single treatment system that is universally suitable for all ship types and their wide-ranging operating profiles. Lack of clarity now on the right treatment system technology will have cost implications going forward.”

The Coldharbour’s GLD™ treatment system is an in-tank arrangement which takes inert gas from the company’s third-generation Sea Guardian™ inert gas generator and supplies it to specially designed gas lift diffusion pipe assemblies inside a ship’s ballast tanks. There are no moving parts and the system uses natural fluid dynamics to ‘stir’ the tanks and make sure that inert gas permeates all the ballast water.

“Whatever the commercial claims that are being made, the science behind optimised ballast water management is actually complex and neither the IMO’s

nor the US Coast Guard’s type approval systems cover all aspects. Proper due diligence and a thorough understanding of the pro’s and cons of different systems is essential, and simply accepting what shipyards or manufacturers tell you may prove profligate.

“Some manufacturers insist that running a number of small systems in parallel will provide sufficient capacity to treat much larger volumes of ballast water. This has never been tested and there is no evidence to show that it is true. Moreover, if one filter blocks, the likelihood is that others will too — a nightmare for the seafarers involved in these operations.”

The Coldharbour Chief Executive outlines some of the other reasons why larger bulk carrier pose particular challenges that demand bespoke technology. Most treatment technologies are based on a combination of ultraviolet treatment (UV), electro-chlorination (EC), disinfection and filtration. None of these systems, however, is best suited to large bulk operation.

UV systems do not work efficiently in waters of high turbidity, such as those found at many of China’s iron ore and coal import terminals, Marshall points out. Meanwhile, EC systems are not effective in waters of low salinity, sometimes requiring extra salt to be added to treatment water to guarantee the necessary chemical reaction. For both systems, the power requirements on board ship, the treatment of large volumes of ballast water in a very short time, and the ability to ensure that filters do not become blocked, requiring a halt in cargo operations, pose major challenges.

A further complication arises because the operators of large bulk carriers often use the upper wing tanks aboard their vessels for ballast, as well as tanks lower in the structure, to aid ship stability on ballast voyages. At load port, these tanks are generally emptied by pumping ballast water directly overboard, a practice that would no longer be possible using the type of in line BWTS that require neutralization of the treatment chemicals on discharge under the terms of their approval certificates.

As far as the Coldharbour GLD™ treatment system is concerned, the issues of blockages, breakdown delays and extra power requirements for treatments and filter back-flushing do not arise because there are no filters to block and the system

is not active at any time during terminal operations.

The system is not vulnerable to pressure drops and pumping capacity limitations either, while there are no complex systems which require any additional training of seagoing personnel.

The Sea Guardian system inert gas generator has a clean burn, a small footprint and an unblemished track record on reliability. Moreover, Marshall says, the system can be tailored to meet the ballast water tank arrangements on board specific ships. This includes specific arrangements for upper wing tanks and so-called ‘heavy ballast’ which, under certain conditions, is used in cargo holds.

Perhaps most importantly of all, Marshall points out that since most ‘general purpose’ management systems tend to treat ballast water on intake, by the time a bulk carrier arrives at the destination port — a ballast voyage between China and Brazil takes about 42 days — the ballast water on board could once again be full of healthy invasive organisms which have regrown and which prevent ballast water discharge standards from being met, he explains.

“This has the potential to disrupt cargo operations, cause delay and possibly lead to financial penalties at the loading terminal, risking a requirement to sail for international waters, de-ballast, re-ballast and return to a berth when one is available.

“The reality is that no treatment technology is 100% effective and any surviving organisms will multiply through a long ballast haul voyage, feeding on millions of their dead counterparts in the benign conditions of the ballast tank. However, neither type approval process — either that of the IMO or the US Coast Guard — addresses this ‘re-growth’ issue satisfactorily.”

This is not a theoretical problem either, as dozens of scientific papers written by leading marine biology academics conclusively show, Marshall stresses.

Ultimately, he warns, a particular ship and/or its operator may gain an unwanted reputation with Port State Control if re-growth issues persist. In response, charterers may think twice about fixing the vessel, or indeed another ship in the same fleet with a similar treatment system. This could therefore have long-term implications for a ship operator’s financial standing.

## B-Qua ballast water test kit wins Seatrade Clean Shipping Award

France-based water microbiology specialist aqua-tools has been presented with a Seatrade Award, during a celebratory lunch marking the 30th anniversary of what is considered one of the most prestigious of maritime industry awards.

aqua-tools' B-QUA ballast water test kit took the prize in the Clean Shipping category, despite intense competition from the likes of Hullwiper, Ecosubsea, NRG Marine, SCF Sovcomflot, and Subsea Industries.

Carine Magdo, aqua-tools' Business Development Manager, who received the prize said: "We are thrilled to have won this award, especially given the strong credentials of the other nominees in the Clean Shipping category. For us, the award represents a significant breakthrough in the ballast water treatment sector.

"The industry is now more fully aware of the importance of ballast water sampling and testing and how it can help ensure systems are operating in accordance with the requirements to prevent the spread of non-indigenous aquatic species."

The company's B-QUA kit is a rapid predictive and preventive solution for testing ballast water for both regulatory compliance and system performance. The portable, easy-to-use kit is based on

aqua-tools' proprietary ATP2G™ method to measure all viable organism size classes specified in the D2 standard. Results are delivered in less than one hour. It can be used both onboard ship or shoreside.

aqua-tools won the award because the judging panel, which included experts from leading industry associations BIMCO, CLIA, HELMEPA, IACS, ICS, INTERCARGO, INTERTANKO and OCIMF, deemed B-QUA successfully demonstrated a technology that supported the industry's objective of clean and sustainable shipping.

The UK Ship Register-sponsored award — designed to "echo the progression and modernization inherent throughout today's maritime industry" — was presented by Doug Barrow, Director, UK Ship Register.

Marc Raymond, aqua-tools' founder and CEO, added: "Winning this Seatrade Award suggests that the industry believes effective, rapid water sampling and testing has a significant role to play in the furtherance of clean, sustainable shipping."

aqua-tools is a France-based technology company specialized in rapid microbial monitoring of water in the marine, industrial, health and municipal sectors.

Its scientific expertise and solutions are designed to mitigate risks associated with



poor or non-compliant water quality. The company's analytical tools are based on accuracy and robust ATPmetry (ATP2G™) technology. It has developed a specific protocol for the rapid microbiological analysis of living cells in ballast water to verify compliance in accordance with the IMO & USCG ballast water discharge standards.

## Singapore MPA selects aqua-tools B-QUA kit for ballast water testing

French water microbiology expert aqua-tools has won a tender to supply Singapore's Maritime and Port Authority (MPA) with its B-QUA ballast water test kits.

A public tender was issued in March inviting several companies to quote for supplying a number of kits to the MPA for use by both port and flag state control authorities.

Carine Magdo, aqua-tools' Business Development Manager, said: "We are delighted to be able to support the MPA in its initiative to consider implementing a ballast water testing regime. Our user-friendly, portable and, above all, effective B-QUA test kits will give MPA users the tools to carry out rapid, indicative analysis of ballast water in line with the requirements of the Convention."

Five B-QUA ballast water monitoring solutions and test kits will be supplied by Singapore headquartered Atlas Marine Services (AMS), which manages B-QUA sales and distribution across the Southeast Asia region. AMS was instrumental in

securing the order.


AMS, CEO, Stephen Herron said: "aqua-tools' B-QUA was selected because it met all the MPA's requirements. It is capable of testing for all three size classes of viable organisms, including bacteria; it complies with the indicative analysis methods stipulated in the BWMC; it provides traceable measurement results within a time frame compatible with port operations; and gives stakeholders the information they need to correctly evaluate the efficiency of ballast water treatment systems."

Another criterion aqua-tools met was that the method needed to deliver confidence that the results demonstrated a scientific correlation between the indicative method and detailed analysis, both in the lab and in the field.

Herron added: "The Singapore MPA leads the world in implementing and enforcing measures that enhance maritime safety and curtail the effect of maritime operations on the marine environment. It was the first Port Authority to mandate

mass flow metering for bunkering operations and could now lead the world in ballast water testing."

AMS, in cooperation with aqua-tools, will provide training to MPA personnel on how use the test kits. Training will be in two stages, starting this month.

Singapore, the world's second largest container port, with more 130,000 vessels calling the port each year, is also the world's largest bunkering hub, registering more than 50mt in annual bunker sales. 



## Angola to put new Dande port out to tender

Angola is to issue an international tender for a new port at Barra do Dande, in Bengo province, which is to the north of Luanda. The concession will involve the concessionaire in drawing up plans for the port, building it and then operating it.

A presidential order from João Lourenço requesting the project to go ahead has resulted in the setting up of an evaluation commission to oversee the public tender, which will be co-ordinated by Victor Alexandre de Carvalho, the general director of the Maritime and

Port Institute of Angola. Also sitting on the commission will be representatives of the Transport, Finance, Construction and Public Works Ministries.

Nevertheless, a government grant of \$1.5 billion, which was agreed by the previous Angolan president, João Lourenço, was recently revoked by the new administration.

Although Barra do Dande is viewed as being a regional hub, involving container handling, it will also have significant dry bulk facilities, given that there is the ease of connection to the

hinterland by both road and rail.

The initial bulk terminal will cover an area of 250,000m<sup>2</sup>, with vessels drawing up to 16m of water accommodated at the 250-metre long berth. However, there is the possibility of expanding this by a further 268ha and an additional 750 metres of berth should traffic merit it.

Furthermore, for vessels requiring a draught of 20 metres, an offshore berth is also to be put in place.

In total, the terminal could eventually occupy 293ha of land and have 1,000 metres of berth. *Barry Cross*

## Record transshipment results for the Port of Gdansk



The Port of Gdansk has calculated its transshipments for the first half of 2018 and the half-year result is nearly 20% higher than predicted. Gdansk also achieved the highest growth dynamics among the Baltic ports.

This is the first time ever that the Port of Gdansk has recorded such a high half-year result. The first half of 2017 was concluded with a total of 18.5mt (million tonnes). After the first six months of 2018, transshipment volumes achieved a historic result — over 25mt of goods.

“Yet again, we have demonstrated that hard work and a change in attitude towards employees and business partners goes a

long way. This record is primarily the success of our contracting partners, as they are the ones responsible for the transshipments. In January, we were the sixth best Baltic port in terms of transshipments, now we rank fourth,” explained Lukasz Greinke, President of the Board of the Port of Gdansk Authority.

Coal achieved the highest increase, with nearly 3.5mt transhipped in Gdansk. This is nearly 67% more than in the first half of 2017. General cargo transshipments went up to a level of nearly 11mt, which means that the result is 37% better than last year. The transshipment of containers increased by 44% and in the case of commercial vehicles — by 24%.

“One of the dominant groups of commodities handled at the Port of Gdansk is fuels. In the first half of 2018, more than 8mt of fuels passed through the port, which is 30.6% more than between January and June of last year,” explained Adam Klos, Commercial Director at the PGA.

High growth was also recorded in the group of other bulk cargo. Gdansk’s port handled more than 1.96 million tonnes of this type of goods, achieving a result 21.2% better than last year’s.

The Port of Gdansk also achieved the highest growth dynamics among the Baltic ports at nearly +35%. For comparison, St. Petersburg recorded dynamics at a level of +14%, Klaipeda +7.5%, and Riga -0.7%. Primorsk, which ranks right above Gdansk in the current ranking, recorded a decrease of 15%.

“Only 1.7mt separate us from Primorsk. As we already announced before, we will do our best to continue to go up in the ranking of Baltic ports. We seem to be doing quite well,” says Greinke.

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## Safe berths for barges at the Port of Rotterdam

The Port of Rotterdam Authority is developing five permanent berths for barges on the Maas side of the Eiland van Brieneoord.

The location has been an anchorage for barges for many years, but the new berths will improve safety on the river, according to Ronald Paul, COO from the Port of

Rotterdam Authority: "Barges are so large and heavy that they can break free when they are anchored. That happened sometimes with the tide changes. We don't want that. The berthing facilities were realized in close consultation with various barge operators." There is space for five barges per berthing location. The central

berths are for barges from 76.5 to 90 metres, the outer two for barges from 90 to 110 metres. There is at least 110 metres space between the berthing locations.

The operations will be carried out by De Klerk from Werkendam. The five berths for barges will be completed by the end of September.

## Port of Hamburg reports on first half of the year

**DISTINCT RISE IN RAILBORNE CONTAINER TRANSPORT – MORE CONVENTIONAL GENERAL CARGO AGAIN, LESS BULK CARGO – CONTAINER THROUGHPUT SLIGHTLY LOWER**

In the first half of 2018 the Port of Hamburg achieved total throughput of 66.5mt (million tonnes). That represented a moderate downturn of 4.9%, with the downward trend slowing in the second quarter. General cargo throughput at 45.5mt (down 2.2%) and bulk cargo throughput at 21.1mt (down 10.4%) contributed to the total in Hamburg. Bulk cargo represents one-third of the total.

This segment caused 71% of the total downturn, with reductions in suction and liquid cargoes being market-driven. However, the 3.1% fall in handling of grab cargoes, the largest sub-segment, accounting for 55% — or 11.6mt — of the bulk cargo total, was within the range of normal fluctuations.

The trend in conventional general cargo handling once again proved very satisfactory. Up 777,000 tonnes or 8.0%, in the first half the upward trend first apparent in the fourth quarter of 2017 was maintained. In the first six months of 2018, imports of heavy freight rose by 62.5% to 160,000 tonnes. Imports of



metals and vehicles more than doubled: Those of metals rose by 121.7% to 79,000 tonnes and those of vehicles rose by 106.4% up to 25,000 tonnes.

In the first half of 2018 container throughput at 4.3 million TEU was slightly lower than in the previous year. Handling of fewer empty boxes was the cause of 81% of the fall. In the first half a total of 525,000 empty containers (TEU) were handled, or 15.6% fewer. Handling of boxes stuffed with general cargo at 3.8 million TEU was almost stable, being 0.6% lower.

Railborne container transport achieved a distinct advance, with total handling 5.4% ahead at 1.2 million TEU. In the 2018 first half, the previous year

figures were beaten, and even the 2016 record. Landside seaport-hinterland transport by rail therefore developed especially satisfactorily. This also prompted a 2.3 percentage-point rise in this most environment-friendly carrier's share of the modal split to 45.1%. In the first six months, in handling for continental Europe 2.7 million TEU crossed the quays of the Port of Hamburg.

The 1.6% drop here can be regarded as slight, around 83% of it being caused by a lower empty-box total. The Port of Hamburg's share of containerized hinterland services rose in the first half by 0.7 percentage points to 62.1% of total throughput.

## Correction: Alex Stewart Agriculture

In the article, 'Inspecting the inspectors', which appeared in the August issue of *Dry Cargo International* (pp35–38), there was extensive coverage of the company Alex Stewart Agriculture.

Alex Stewart is a renowned and respected provider of inspection and analysis services to the dry bulk industry, and deals with cargoes including fertilizer;

animalfeed; grain and wheat.

Unfortunately, due to an error in the editing process, the last few words on p37 of the August issue were lost, so the list of countries in which Alex Stewart offers its services was incomplete.

The complete list of countries served by the company is: Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, Egypt,

Estonia, Germany, Italy, India, Indonesia, Kazakhstan, Latvia, Malaysia, Netherlands, Peru, Philippines, Romania, Russia, Spain, Thailand, Turkey, Ukraine, UK, Uruguay & the USA.

*Dry Cargo International* offers its unreserved apologies to Alex Stewart Agriculture, and to the readers of the magazine, for this error.



## Scoop at North Sea Port: ArcelorMittal's 'All Weather Terminal'

ArcelorMittal Gent, Participatie-maatschappij Vlaanderen ('PMV': Flanders participation company), Euroports and North Sea Port are working together on the realization of the very first covered loading quay in Ghent at North Sea Port: the 'All Weather Terminal' (AWT). This terminal represents an investment of more than €50 million.

The new terminal is being built next to the existing general cargo quay of ArcelorMittal Gent at the Ghent-Terneuzen Canal. At first, the terminal will mainly be used to store and ship ArcelorMittal Gent's finished steel coils. Twenty per cent of the storage capacity can also be used for the handling of other materials and (general) cargo.

### 200 METRES OF QUAY WALL

AWT's warehouse has a storage capacity of 60,000 tonnes, will be 240 metres long and 60 metres wide and will be fitted with two rails that are linked to the quay bundle. The warehouse will be equipped with three entirely automated travelling cranes for the unloading, sorting and loading of material. The covered quay wall will be 200 metres long and the dock will be 25 metres wide. The terminal will rise some 30 metres above the water level. Vessels having a carrying capacity up to 10,000 tonnes will be able to moor at the new quay. The pre-sorting zone will be equipped with two automated travelling cranes. Euroports is providing two telescopic cranes for the loading and unloading of

ships. For Euroports — with 26 terminals of its own in Europe — this is a significant addition and extension of its services to the steel and metal industry.

### 24/7 LOADING OF STEEL

Manfred Van Vlierberghe, CEO of ArcelorMittal Belgium: "Before, the loading of steel could only be done in dry weather, whereas now it can happen 24/7, irrespective of the weather conditions. The AWT makes it possible to better spread the supply of coils from the dispatch halls at ArcelorMittal Gent to the quay and as such optimize the internal logistical operation. Euroports has experience in the handling of steel and has been co-operating for years with ArcelorMittal. The use of the AWT, in combination with the existing 'open' general cargo quay, moreover, is necessary for the realization of the growth of the Ghent steel company. The AWT is also an investment in sustainability, because the bigger dispatch capacity per ship saves on a considerable number of truck transports (up to 25,000 trucks per year). In doing so, ArcelorMittal Gent wants to grow into a leader in the field of sustainable logistics."

"The very first AWT makes it possible to group the different cargo flows in an even more efficient way, owing to which the companies are getting more logistical opportunities," says Daan Schalck, CEO of North Sea Port. "North Sea Port wants to play a facilitating role in the field

of infrastructure in order to make the port as accessible as possible: via rail, road and inland and seagoing navigation. By investing together with different partners in the 'All Weather Terminal', North Sea Port helps the companies grow in a sustainable way."

### READY BY MID-2020

The new 'All Weather Terminal' will be owned by AWT GENT NV, which was founded by PMV and EPICo. AWT GENT will take care of the design, construction, financing, maintenance and operation of the terminal. AWT GENT NV entrusts Euroports as a logistical maritime player with the operational execution of the flows from, to and inside the AWT.

North Sea Port conceded the land for the construction of the terminal to AWT GENT NV and will also dredge the berths. Stadsbader, a contractor for infrastructure works and big industrial projects, will take care of the construction and maintenance of the terminal. PMV is an investment fund set up by the Flemish government with the intention of investing in infrastructure for sustainable economic development.

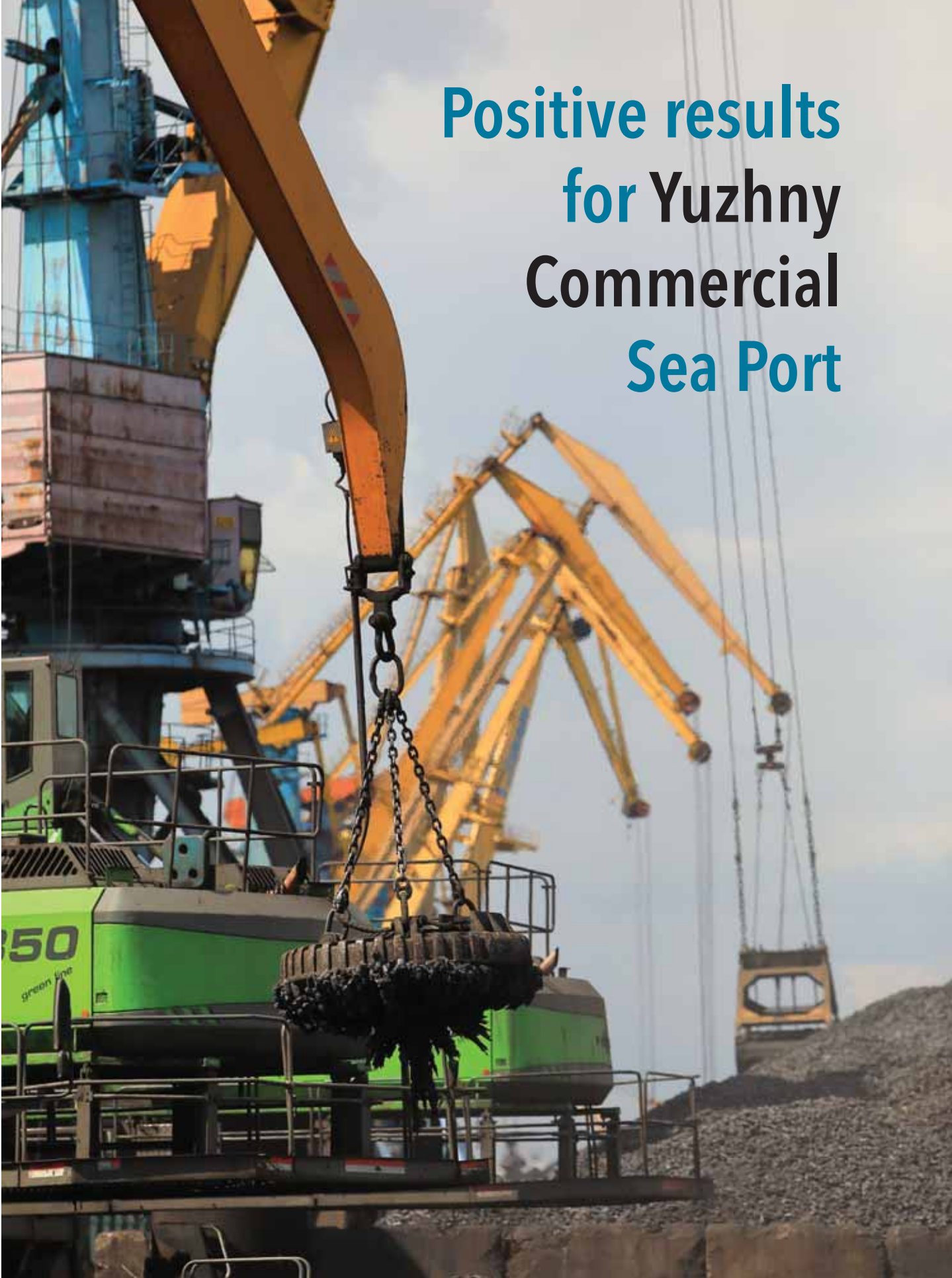
The signing of the contract took place in the middle of June, the environmental permit is now being prepared and was applied for with the intention to start the construction by the end of 2018. It is expected that the 'All Weather Terminal' will be operational by mid-2020.

### ABOUT ARCELORMITTAL BELGIUM

ArcelorMittal Belgium, with branches in Ghent, Liège, Genk and Geel counts 5,800 workers. Its total direct and indirect employment is estimated at 13,000 jobs. The company produces high-quality steel for the most diverse applications in the automotive sector and other industrial sectors such as construction, white goods and packaging.



# Positive results for Yuzhny Commercial Sea Port



The Ukrainian State Company Yuzhny Commercial Sea Port handled 7.2mt (million tonnes) of cargo in the first seven months of 2018, including 4mt of ore for

export, 1.3mt of thermal and coking coal and 1mt of pig iron. These figures are considered to be the best when it comes to Ukrainian state stevedoring companies.

The handling of main cargo — products for mining and metallurgical industry — involves the specialized car dumper complex and portal crane technology.

Railcars with bulk cargo are discharged using two rotary car dumpers.

The complexes are equipped with five units of defrosting facilities, which heat (defrost) cargo in low-temperature conditions. The conveyor belt system (the total length of one route conveyor belt is 1,750m) transfers the cargo to the berths and then the cargo is piled with two stackers. Portal cranes equipped with grabs are used for loading and unloading the cargo from vessels.

Most cargoes are handled by portal crane at SE STP Yuzhny, in particular the Tukan and Liebherr models. These cranes are strong and powerful, and enable a loading rate of up to 1,500tph (tonnes per hour). In 2017, the maximum loading rate of the cranes reached 82,000 tonnes per day. The boom outreach provides uniform loading of Capesize vessels at the berths without additional manoeuvres of the vessel, it reduces handling time. In addition to three Tukan cranes, there are 38 cranes from Liebherr, Sokol, Kondor and Gants, which offer efficient cargo handling.

The state company's multi-purpose



portal crane technology makes it possible to handle cargoes for export and import, including breakbulk cargoes and exported metal products, equipment and so forth. Thus, the port handled 1mt of pig iron within seven months in 2018. This is a tenfold increase on the amount handled in the same period in 2017.

Yuzhny Commercial Sea Port has approved a long-term strategy for the development of the state company, in the framework of its implementation the port is working to: attract new cargo owners; develop the railway infrastructure of the Beregovaya station and access roads; expand the range of cargoes in order to

boost cargo throughput; advance the infrastructure and capacities of the basic handling areas; increase profitability; and enhance the efficiency of cargo operations and security level.

Today the port is equipped with high-tech equipment — 64 cranes and 105 units of port machinery, including tractors, loaders etc. On average, up to 150 railcars with imported cargo and 400–450 railcars with cargo for export are handled within 24 hours. The port operates five berths with depths of up to 19 metres. Yuzhny Commercial Sea Port is the deepest port in Ukraine. The total length of the berthing line is 1,500 metres.

DCi



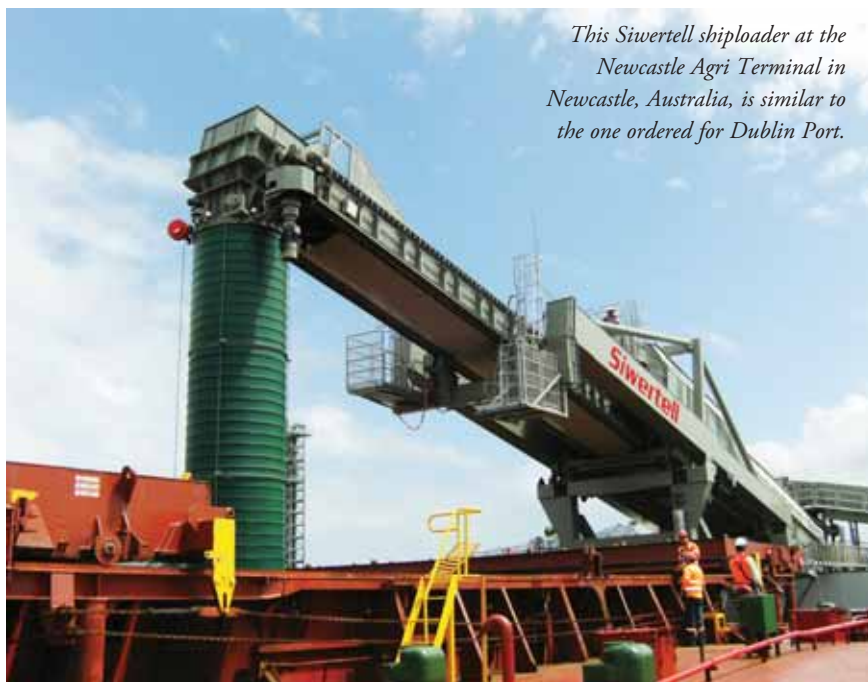
## Siwertell designs new triple-enclosed loading system for eco-friendly ore handling operations in Ireland

Siwertell, part of Bruks Siwertell Group, has secured an order for a shiploading system from Irish mining company, Boliden Tara Mines DAC; an operating subsidiary of Boliden AB. The specially-designed system will serve the company's new terminal located in Dublin Port's Alexandra Basin, ensuring close to zero dust emissions for the operator. The order was booked into Bruks Siwertell Group's second quarter order intake.

"Boliden required a flexible system capable of handling a variety of cargoes and a wide range of vessel sizes, but with a very strict approach to dust emissions," explains Peter Göransson, Sales Manager and Senior Advisor, Siwertell. "Our lengthy experience and expertise in bulk material loading was a significant factor in winning this contract, including the fact that no efforts were spared in designing a triple-enclosed loading system that will ensure as close to zero emissions as technologically possible for the operator.

"A high loading capacity, combined with easy system operation and low service and maintenance costs, were also significant factors in Boliden's decision to invest in Siwertell's market-leading technology. Additionally, it complies with best available technology (BAT) and reference document (BREF) regulations," adds Göransson.

The new system comprises a triple-enclosed belt-type ship loader, with luffing and slewing capabilities, a reversible shuttle-belt conveyor with dual remotely-operated connection points, as well as a triple-enclosed jetty and overland conveyor.



*This Siwertell shiploader at the Newcastle Agri Terminal in Newcastle, Australia, is similar to the one ordered for Dublin Port.*

It will handle zinc and lead concentrates, which are transferred from rail wagons to a receiving storage building. From here, a conveyor belt leads to a new quayside facility in Alexandra Basin. Siwertell designs are well-suited for sticky and hard-to-handle materials and the new system will be capable of loading ships of up to 10,000dwt at a continuous rated capacity of 600tph (tonnes per hour).

"Based on Siwertell designs, and with production and construction supervision as a part of the delivery scope, Siwertell, together with local partners, will have full control of the project from design to handover," continues Göransson. "With

carefully-selected components from Swedish and other European sub-contractors, we will deliver an efficient, reliable, high-performance system with low operational and maintenance costs."

The steel structures for the shiploader will be produced in Far East and equipment will be mainly supplied from Sweden. The overland and jetty conveyor will be produced locally in Ireland with the conveyor equipment supplied from Europe. The system will be erected and commissioned at Dublin Port in partnership with an expert Irish company and is expected to be fully operational by August 2019.



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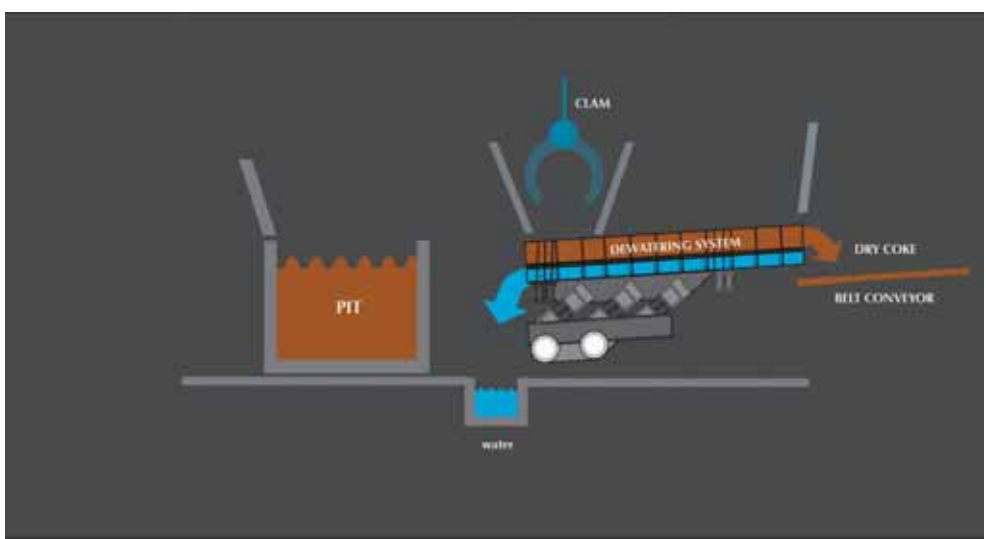


# General Kinematics awarded petcoke de-watering project



General Kinematics was awarded a new contract for improvements at a leading refinery in South Eastern Asia this summer. After researching ways to improve current processing and considering an alternative to complex silo de-watering systems, GK's patented Vibratory Dewatering Conveyor Technology was selected. With this new system, the refinery will increase petcoke (petroleum coke) dewatering capacity, enable higher production rates and require minimal usage of valuable refinery space.

The previous process involved removing the petcoke from a deep pit and placing it upon a sloped pad for drainage. Following an extended static drainage period, the pet coke was removed and transported to the coke crushing and materials handling system for storage. This process inhibited a production increase and, after reviewing the available technologies, the GK De-Watering Conveyor was selected. GK's vibratory process technology will enable the refinery



to lower their clamshell into a water inundated pit and discharge wet petcoke directly into the GK De-Watering Conveyor where excess water is removed and returned to the pit prior to crushing. GK's De-Watering Conveyor also meters the clamshell surge load to the crusher to prevent overloading the conveyor belt take away system to storage. Vibratory De-Watering technology will enable the refinery to increase its production by

approximately 25% with a much smaller footprint, shorter installation and commissioning time, and at a much lower cost than the other technologies considered.

General Kinematics' petcoke De-Watering method was developed in response to an overwhelming industry need for a simplified solution to petcoke de-watering. After research and development along with extensive field

testing, patents for both the design of the GK Vibratory De-Watering Conveyor as well as the GK De-Watering Method are documented under patent number 7,108,793 and patent number 7,186,347.

The GK Vibratory De-Watering Conveyor Technology is proven in installations operating for over a decade in North America and will enable a significant production increase with lower residual moisture content and a substantial reduction in petcoke fines.

Installation and commissioning of the GK De-Watering Conveyor is scheduled for late summer 2019 with full production in early autumn.

**ABOUT GENERAL KINEMATICS**

General Kinematics Corporation, incorporated in 1960, was established to market, design, and custom fabricate innovative

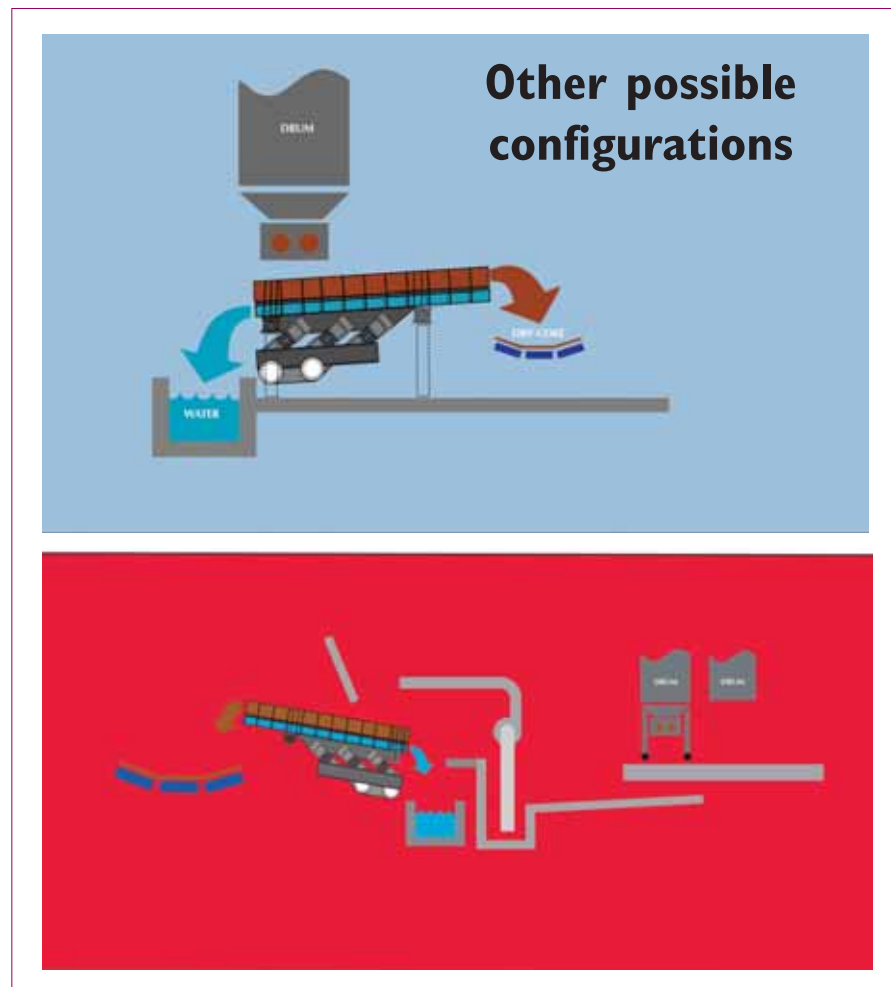


vibratory materials handling and processing equipment. Today the company is one of the world's largest suppliers of vibratory processing equipment, having held more than 200 worldwide patents, and is acknowledged as a major contributor to the technical advancement of vibrating equipment design and application.

General Kinematics serves a worldwide customer base through a network of engineering-oriented independent sales representatives who cover major industrial markets throughout the United States. International markets are serviced from subsidiary operations and through a combination of representatives, licensed manufacturers, and strategic alliances with leading industry-specific organizations in other strategic locations.

Today, over 50,000 General Kinematics units have been installed in virtually all of the world's industrialized countries. As new process and efficiency challenges emerge, General Kinematics is uniquely qualified to address these needs with advanced technology, innovative engineering, new materials, and manufacturing techniques... all applied to improving customer productivity and profitability while meeting ever more stringent requirements.

Today, GK knows no limit in its ability to provide a broad level of engineering support and capacity that other companies cannot offer. It brings a 360° view to the whole process picture, often supplying engineering resources its customers do not have, or do not wish to fund internally.



# Covering all your bases?

enclosed storage solutions from the market's big hitters



Photo: courtesy Legacy Building Solutions.

## Legacy tension fabric buildings feature structural steel frame

Combining rigid-frame engineering with the proven benefits of tension fabric membranes, Legacy Building Solutions offers superior quality fabric structures that are fully customizable. This design concept provides a high level of flexibility for a wide array of applications and industries, including commercial and industrial warehousing, equipment and bulk material storage, and many more.

Legacy fabric buildings utilize a durable rigid frame in place of the hollow-tube, open web truss 'hoop' framing traditionally used for fabric structures. The strength of the structural steel frame provides several engineering advantages, notably the ability to easily customize buildings to the exact width, length and height required. In addition to long clear spans, the buildings have straight sidewalls that maximize the useable square footage inside the structure.

The design allows for much more structural flexibility than traditional fabric structures, including the ability to add

lean-tos, mezzanines, sidewall doors and more. The structures are also engineered to provide desired overhangs or handle additional loads for items such as sprinklers and conveyors.

Unlike hollow tube steel, Legacy's solid structural steel I-beams are not vulnerable to unseen corrosion originating inside a tube. Additionally, there are multiple coating options available for all steel components, including hot dip galvanizing, primer and powder coat paint.

Legacy buildings feature high-quality fabric roofs that eliminate the corrosion concerns associated with metal-constructed facilities. A wide variety of polyethylene and PVC fabrics are available. The durable fabric allows natural light to permeate the structure during daytime hours, while insulation and liners can be added to meet energy codes or satisfy customer specifications.

Installation is up to three times faster than with conventional buildings, and the

design can be adjusted for stationary or portable applications. Sidewalls can be customized and built with any desired material — including steel, concrete or stone — and then easily lined with fabric to prevent corrosion to the interior, or to create a seamless look for occupied buildings. Legacy steel components and fabric covers are backed by a comprehensive warranty.

Legacy Building Solutions was the first manufacturer of fabric-covered buildings to incorporate structural steel beams instead of open web trusses. The company offers assistance from concept to completion, including renderings, foundation design, installation and project management. To date, Legacy's in-house, professional installation crews have constructed more than 35 million square feet of fabric buildings. Committed to quality and continuous improvement, Legacy maintains ISO 9001:2008 and CSA A660-10 certification.



## Square bin storage from Cimbria: supplying the feed and food industry

Once again Cimbria had a busy year with many interesting square silo installations around the world. Also on the Scandinavian market, there has been an increase in activities and enterprise, and Cimbria has supplied a number of square silo constructions for the feed and food industry.

### SILO FACILITIES FOR FISH FEED AT CARGILL, NORWAY

At the EWOS fish feed factory at Bergneset in Norway, which now belongs to Cargill, Cimbria supplied an installation of a new bulk silo for fish feed pellets. The site is situated in the very north of Norway, close to Tromsø in the town of Bergneset, where EWOS has one of its three production locations for fish feed in Norway.

The plant consists of a square silo system with 27 silo cells. The silo has been raised with a steel deck being mounted at a height of approximately 6m. Below the deck, there is a flat storage area for storing big-bags.

As the silo is designed for storage of fish feed pellets, the importance of gentle handling of the product has very high priority. After the feed pellets leave the production department, they are sifted on two sieves mounted in a tower above the silo. After the sieves, there are buffer bins and the pellets are transported from here

*Cimbria supplied a new bulk silo for fish feed pellets at the EWOS fish feed facilities in Bergneset in Norway (and below).*



to the storage bins by means of an X-Y robot-car moving along and across the silo deck on specially designed rails. Underneath the silo deck, reception bins with the same volume as the moving car are installed, thus enabling the bins to be emptied very fast. Emptying of the silo takes place by means of belt conveyors connected to the existing conveyor system running to the quay for loading onto ships.

As the silo is installed so close to the sea, the silo walls and decks are manufactured as hot-dip galvanized in order to provide as much protection for

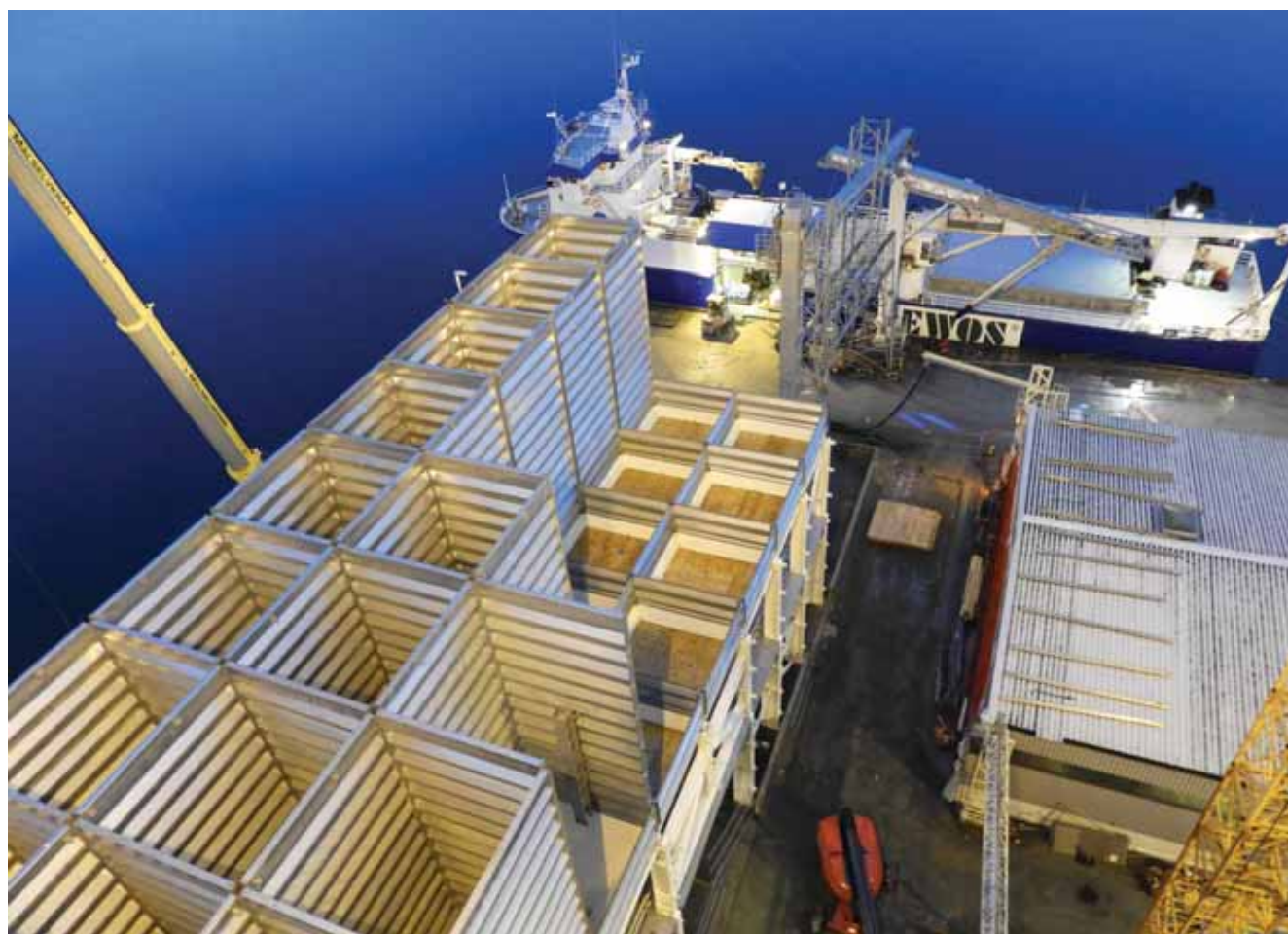
the steel as possible.

The parts for both the Marine Harvest and Cargill orders were delivered directly to the sites by ship from the port in Thisted.

### STORAGE OF COFFEE BEANS

Since its foundation in 1960, the Danish-based company BKI Kaffe A/S (Brazilian Coffee Import) has delivered quality coffee to Danish consumers, whilst in recent years exports to the rest of Scandinavia have increased significantly.

Today, BKI roasts and packs coffee from



*Cimbria had to provide 72 new silo cells with ancillary steel constructions and conveying equipment for integration with the existing installation at the BKI coffee import company (and below).*



all over the world at its high-tech coffee plant in Højbjerg near Aarhus, in Denmark. BKI is one of the biggest operators in the coffee market and is the only 100% Danish-owned coffee producer with production facilities in Denmark selling to the retail and food service sector.

Food safety and quality are important at BKI, which aims to produce safe foodstuffs of high quality. The enterprise is certified and BKI's employees receive ongoing training in food safety and quality.

Recently, BKI Kaffe ordered an extension of its square silo installation. This involved 72 new silo cells with ancillary steel constructions and conveying equipment for integration with the existing installation. The new silo is being installed on top of the roof of an existing building for logistical reasons and due to constraints in terms of space.

In connection with the facility, great importance is attached to its suitability with respect to foodstuffs in accordance with EN 1935/2004/EC, which means, among other things, that:

- ❖ the silo cells are delivered with a specially approved powder coating that has been certified in connection with the storage of green and roasted coffee beans;
- ❖ the steel for the silo cells meets the requirements concerning



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# HIGH QUALITY EQUIPMENT FOR DRY BULK CONVEYING

## CIMBRIA CONVEYING EQUIPMENT

Cimbria develops and manufactures an entire range of conveying equipment for handling a vast variety of bulk materials, ranging from agricultural products to industrial commodities and raw materials.

The Cimbria equipment are delivered worldwide as singular supplied equipment or as a part of a total solution where they link key machines to form smoothly running industrial plants.



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maximum content of lead, cadmium and arsenic;

- ❖ conveyors are equipped with wearing plates that are suitable for use with foodstuffs, and they are produced in standard pre-galvanized plate. Chains and wheels are treated with liquid paraffin. Belts in elevators are fitted with belts suitable for use with foodstuffs. Elevator buckets are manufactured in steel. Gear motor and bearings are greased with non-toxic oil.

The new facility will be a fully-modern facility designed in accordance with the latest principles with regard to food safety in accordance with Eurocode building and construction standards.

### MARINE HARVEST – NORWAY

In recent years Cimbria has received a regular number of orders for the extension and completion of silo and conveyor systems for the Norwegian company Marine Harvest.

Last year, the order list included an extending of the second finished product silo with an extra 3,100m<sup>3</sup> of storage capacity for fish feed pellets.

The silo block was extended with five rows of silo cells. First of all, the gable cladding was removed and secured it in a safe place for reinstallation after extension was complete.

The steel work and service floor below the silo bins were extended for the new cells, after which the silo extension was built up, including new roof frames.

After installing the silo, the job was completed with cladding

of the new silo extension and refitted the existing gable.

Cimbria was established in 1947 and is today an international organization with 900 employees in 30 companies throughout the world. Since 2016, Cimbria has been a part of AGCO corporation. Cimbria offers storage, equipment and processing plants for the grain and seed

industry and transport and conveying equipment for bulk handling. The company has an experienced, highly qualified workforce, its own development and construction department and modern production facilities, which enable it to construct and manufacture all of the solutions in accordance with the individual requirements of each client.

*Cimbria has supplied a range of solutions to Marine Harvest in Norway to store fish feed pellets.*



## Rubb Buildings offers agile solutions for a changing world



In the run up to leaving the EU, many UK businesses are increasingly looking for facilities with agility and flexible storage space.

'Build to suit' storage solutions are key to companies being more efficient with available space and planning for the future. Businesses are also looking for the ability to be able to make structural alterations to accommodate forthcoming demands.

Rubb Buildings Ltd Managing Director Ian Hindmoor commented: "In the past two to three months the Rubb Buildings sales team have seen an increase in the requirement for temporary and smaller storage shelters. Another growing lead trend we have noticed is the option to rent structures over periods of 12-60 months.

"Feedback from our customers suggests that they are planning for the future, to be able to maintain the flow of their production and fulfil the demand from their

customers throughout these uncertain times. Rubb storage facilities provide an alternative and sustainable solution to traditional storage warehouses. To keep up with this ever-changing environment a semi-permanent fabric structure helps save on costs and is able to adapt to the changing requirements of the end user."

According to *The Economist* magazine, some companies, whose manufacturing processes rely on raw materials transferring between production facilities in different countries, are also talking about stockpiling. "Airbus says it has asked its suppliers to start 'ramping up' their stock of components for its aeroplanes." Meanwhile, according to the same article, material hoarders are 'in the minority'. "Economy-wide data has revealed little evidence of firms preparing for 'no deal'." Industry leaders are again expressing uncertainty about the strength of demand

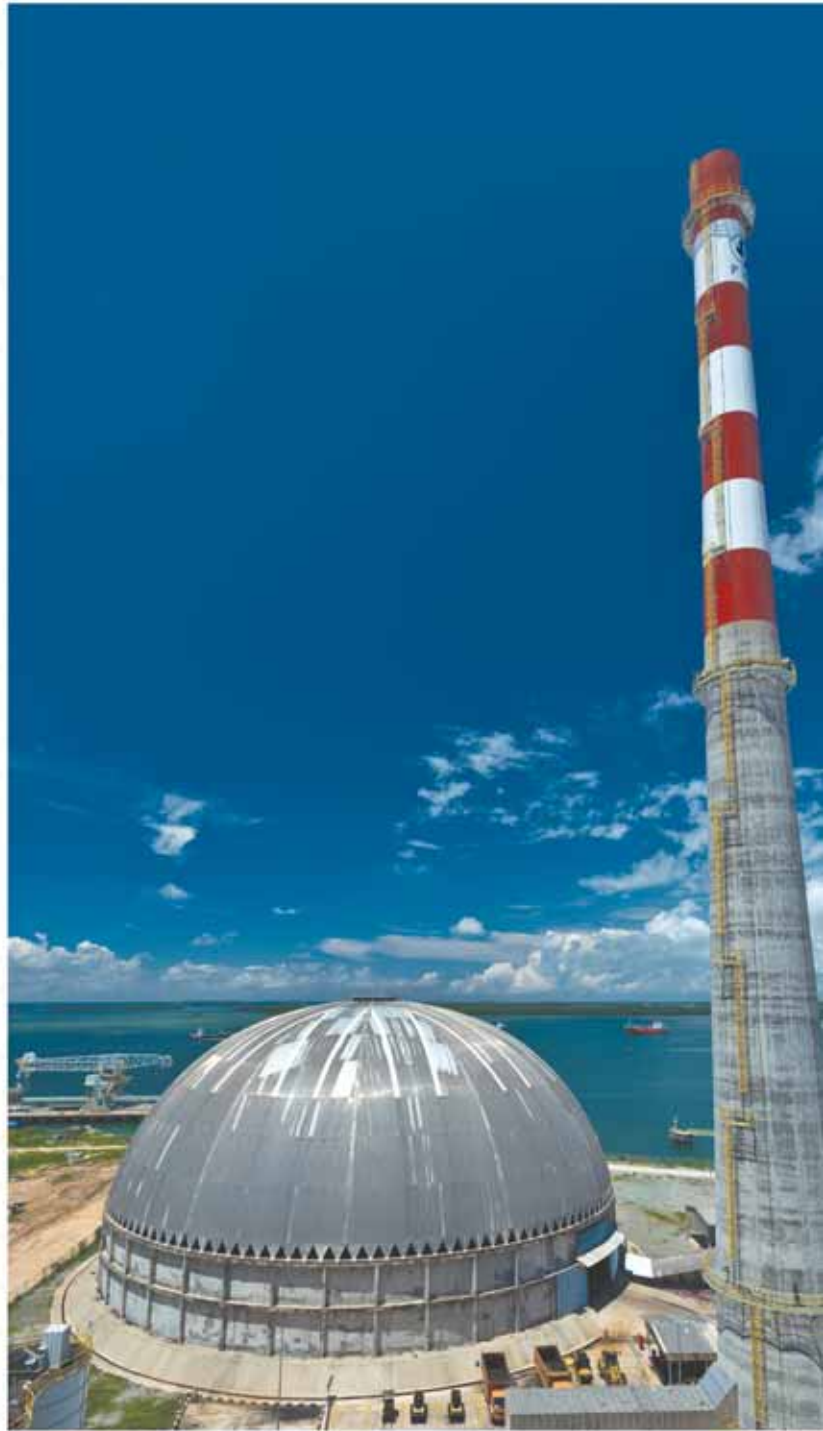
after Brexit, and could be seeking to streamline investment in production moving forward.

However, as Brexit approaches, still with no deal on the table, industries could find that stockpiling becomes a necessity. Stockpiling requires large amounts of space, as we face a current shortage of warehousing. A greater shift towards online business means a greater demand and increased competition for cost effective, quality 3rd Party Logistics (3PL) storage space.

Ultimately flexibility, agility, capability and dependability will help support future outcomes in a Brexit environment. With Rubb, businesses can consider how to best use their existing space in order to remain agile in an ever-changing world. Flexible warehouse space provides businesses with many unique advantages. The benefits of Rubb buildings include fast design, manufacture and construction, with the flexibility to be adapted, modified, extended or relocated if needed. This allows clients to adapt quickly to change.

Hindmoor added: "Flexibility is the key for warehousing moving forward. There continues to be a very high demand for warehousing, alongside falling development and availability. With a fall in warehouse vacancy rates we are finding our clients are looking to utilize the available land they have by creating custom designed fabric warehouse solutions to expand and enhance their temporary and permanent storage space options. Rubb warehouses can be quickly installed on site, but also can be modified, extended or even moved to suit changing operational needs."





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## Why a MegaDome® building is an ideal bulk storage solution



Storing bulk goods can be a challenge. It requires a building with maximum storage capacity that is easily accessible year-round and that keeps products dry and protected from the elements, all while respecting local building codes.

MegaDome® buildings are a trusted and proven solution for all bulk storage needs. Harnois' in-house engineering team designs and manufactures fabric buildings that are quick to install, cost-effective and built to perform, season after season.



necessary documents are available and well presented.

The company's dedicated experts are there to support its customers at every step, from the initial planning and approval stages all the way through to final installation and follow-ups.

### INNOVATIVE DESIGN FOR OPTIMIZED STORAGE

MegaDome's innovative buildings don't require a central column and offer large wall clearance to maximize bulk storage space, allowing users to easily access and manoeuvre machinery.

The structures are built with oval tubing, making them more resistant than round or rectangular tubes with similar dimensions. They can also be adapted to specific loading equipment and conveyors, such as airtight openings for equipment that needs to pass through the membrane.

The lower section of the structure's arches (the area most exposed to dirt and corrosive elements) is always hot dipped after welding to ensure the protection of the steel and the durability of the structure. The structure itself can also be hot dipped for extra protection. Also, MegaDome® fabric buildings can be easily extended after installation to keep up with the growth of the client's operation.

MegaDome® buildings can be customized with various industrial options, like single or double roll-up openings, side garage doors and ventilation systems, which are extremely useful when storing bulk goods. With over 50 years of experience in

the greenhouse industry with Harnois Greenhouses, the company has developed high-performance ventilations systems that are adapted to its buildings, allowing it to meet specific ventilation needs to ensure that products stay dry in all conditions.

Finally, the structures are covered by a PowerShield® membrane that allows natural light to penetrate the building year-round. This reduces the need for artificial lighting, which can add up to significant energy savings.

This durable, waterproof and fire-resistant membrane is assembled at the MegaDome® factory to ensure the highest quality standards.

### ADAPTED PORT STORAGE — A CASE STUDY

One of MegaDome's clients, Oshawa Stevedoring on the Ontario Harbour in Canada, was looking for a structure with an opening large enough to store a conveyor and 30,000 tonnes of salt. To answer this challenge, Harnois installed an 80ft x 360ft structure with a large storage area and front opening option. The client can now store its materials in a dry, protected environment and is able to access them easily all year round.

### EXPERTISE TO RELY ON

Harnois Industries Inc. has been a Canadian manufacturer of steel structures for over 50 years. Its trusted experts design innovative engineering structures for the agricultural, industrial and municipal sectors that meet the operational needs and financial objectives of its clients.

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

### STORAGE SOLUTIONS FOR EVERY SECTOR

MegaDome® structures are specially designed to meet the needs of the agricultural, industrial and municipal sectors. They are built to store and protect bulk materials like coal, ore, cereals, wood, salt and manure, keeping them dry and accessible all year long — even in the cold winter months.

### FLEXIBLE STRUCTURES CUSTOMIZED TO MEET SPECIFIC REQUIREMENTS

MegaDome® buildings are designed to adapt to intensive use in industrial environments. The dome covers and protects bulk industrial goods, making sure they are stored in dry conditions and are easy to access even in winter.

Harnois' in-house engineers design buildings that can fit entirely in one container (or a couple of containers depending on the size), allowing for fast delivery and efficient installation wherever its customers' sites are located.

MegaDome® structures also help with inventory management by limiting product loss and damage, saving invaluable time and resources throughout the seasons.

### CONSTRUCTION CHALLENGES SOLVED

MegaDome® structures are designed to comply with municipal standards and regulations. Harnois' engineers officially stamp building plans, making it easier to get quick approvals for projects of every scope and size, while ensuring sure that all





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## Dome Technology makes it easy to switch commodities stored in its domes

**Ready for Plan B:** In many situations, a dome is capable of storing different products should a company change its focus. Here are the steps to a successful transition between bulk applications, writes *Rebecca Long Pyper for Dome Technology.*

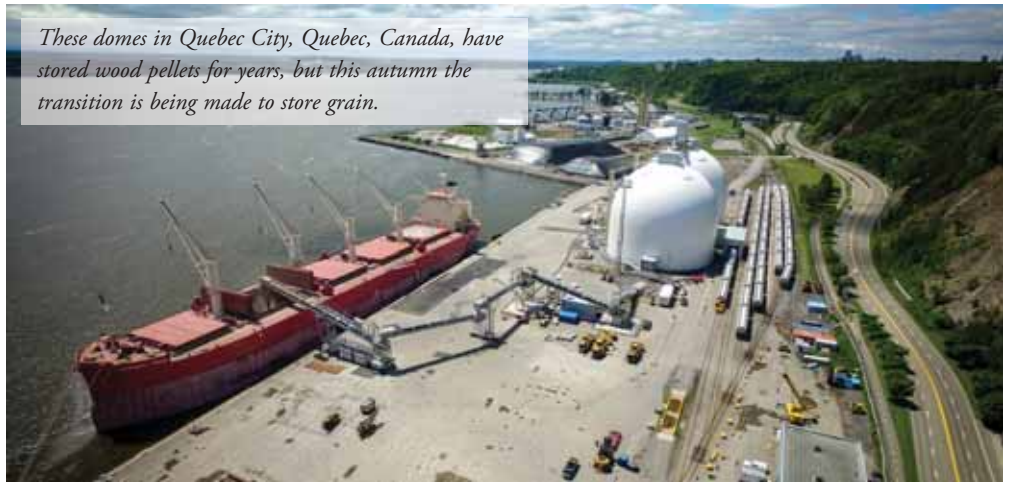
Think once you've chosen a product to store in a dome, you're locked in for life? Think again. Transitioning from one bulk material to another might not be as complicated as you'd expect, especially if your company anticipates potential shifts from the get-go.

Dome Technology clients have made storage changes in the past, and one customer will switch from wood pellets to grain this fall. It's a smart way to maximize on existing infrastructure and to ensure multiple options are available no matter what the market does, said Dome Technology sales manager Lane Roberts. "In case [an industry] fell through, a company would still have the capability to reach out to other things," he said.

The easiest way to make a dome versatile for distinct products is to develop the project with Plan B in mind. Here are a few factors company management and facility operators should consider for a smooth transition:

- 1 To maximize storage, plan a facility designed for the heaviest product. This ensures engineers will design the dome and its systems for the hardest work they might face.
- 2 The easiest changes occur between similar products. A company switching from, say, coal to petcoke isn't going to require the same degree of calculations, reconfiguring, or cleaning as switching from canola to sugar.
- 3 To determine if an existing dome can store a different product, look first at

*These domes in Quebec City, Quebec, Canada, have stored wood pellets for years, but this autumn the transition is being made to store grain.*



the foundation. "Say you have a dome that can store 100,000 metric tonnes of product. You could potentially store 100,000 metric tonnes of a different product with similar ground loading characteristics with no foundation modifications required," said engineer for Dome Technology Adam Aagard.

- 4 When the stored products have dramatically different angles of repose, it is important to consider how changing the products will affect the foundation system. For instance, for a dome storing cement clinker with a steep angle of repose — about 45° — switching to cement powder with 10 to 12° will change the loading profile on the foundation system. That's because the clinker will have a higher load in the middle of the dome floor and lower load on the perimeter while the cement will have pretty much the same loading straight across. "Changes in stored product in the dome can often be easily accommodated through collaboration with our dynamic team," said Dome Technology CEO Bradley Bateman.

For example, if you were to switch from wood pellets to molybdenum, you'd go from a product with 45 pounds per cubic foot of density to 115. With higher densities, the stored product may

not be stored as high on the dome wall, but the existing system can be analysed to determine how to safely store the new product.

- 5 Cleaning the inside of the dome shouldn't be a deterrent. Either a good spray down with water or a scrub with detergent might be all that's required. In most cases, any residue left behind would be negligible, but considerations will vary industry to industry.
- 6 If you are planning to switch products in the future, not everything needs to be considered upfront; some features can be added later. For instance, if the new product requires a different conveyance system, that's a relatively easy change — though it obviously comes with a cost.
- 7 Something to consider is possible chemical incompatibilities between respective products. For example, some fertilizer will corrode standard rebar; if the previous stored product didn't have this concern, steps would need to be taken to mitigate corrosion as needed.

The ability to change the product stored within a dome gives companies flexibility to adjust with the market. With the help of engineers and product experts, companies can use the strength of the dome to stay ahead of the game in the bulk industry.



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## Top quality grain storage systems from Bühler



### LATEST GRAIN MANAGEMENT TECHNOLOGIES FROM BÜHLER MAKE AN IMPRESSION

#### HIGH PRODUCT QUALITY INCREASES EFFICIENCY

As demand continues to increase, grain already constitutes the nutritional basis of around 3.5 million people. In view of the growing demand, responsible handling of raw materials throughout the entire value chain is essential. Yet currently, over 30% of all food produced is still lost on the journey from 'field to fork' — a significant part of which occurs during storage. Professional grain management can effectively counteract this. In this area, Bühler Grain Quality & Supply offers end-to-end solutions — covering individual consultancy and planning in accordance with customer requirements, construction and commissioning of plants, comprehensive customer service, and digital solutions for product quality monitoring.

#### TAILOR-MADE STORAGE SOLUTIONS

The key elements of grain management, are silos and flat stores. They are fundamentally used to maintain a balance between raw material supplies, production of

intermediate and final products, and provision of finished products. Due to the continuously increasing demand for grain, the demand for storage capacities, which can be built quickly and economically, is growing. Bühler Grain Quality & Supply's modular design provides a tailor-made solution for every customer requirement. As a result, in addition to highly automated systems of any storage capacity, economical individual solutions for small businesses can also be implemented. Depending on grain

type, site conditions, and how the warehouse is stocked and emptied, varying requirements are placed on storage systems. Steel silos and flat stores are the most common storage types:

- ❖ **steel silos** are versatile in terms of placement; both inside and outside. Large storage capacities can be realized on a compact footprint. With tiered diameters and heights, steel silos can achieve a storage mass of up to 19,000 tonnes, or a storage volume of up to





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25,000m<sup>3</sup>. Easy to install and low maintenance, steel silos are an economical storage solution for free-flowing products. The self-contained sheet metal design provides good protection against external influences, such as pests and weather conditions. Steel silos can be integrated into an automated plant, using elevators and conveyors.

- ❖ **flat stores** provide a sound storage solution, especially for non-free-flowing products. They are characterized by versatility in terms of storage capacity creation, that is easy to set up. In addition, surface loading is kept to a minimum.

#### STORAGE RISK FACTORS

Storage has a decisive influence on product quality. The conditions in the silo are crucial to determining the length of time that it is possible to store goods safely. If the relative humidity in the silo rises to above 65 %, mould will grow, and mycotoxins may also form. These endanger the health of humans and animals. Monitoring of temperature and humidity of storage conditions, with adequate ventilation and cooling, is therefore essential to prevent value loss. Whether a filtered ventilation system with ambient air can be implemented, depends heavily on the climatic conditions at the installation site. The outside air temperature as a rule of thumb can be at least 5°C below product temperature in the silo, and the relative humidity must not exceed 65%. The planned storage period is also crucial in terms of whether filtered ventilation will be adequate, or whether active cooling is necessary. Ultimately, cooling the product to below 13°C, with the appropriate level of product moisture, not only ensures virtually unlimited shelf life; it also suppresses pest activity, and minimizes respiratory losses — losses, which would

often exceed cooling costs many times over.

#### PRODUCT STORAGE VIA CLEANING, DRYING, AND ONLINE MONITORING

To ensure adequate product shelf life and increase quality, in addition to suitable ventilation and cooling, it is important to clean and extract dust before storage. This minimizes the number of foreign bodies, plant residues, and insects, and diseases can be prevented. Bühler offers the right cleaning system for every grain type, and other bulk materials — from screening machines with integrated aspiration, to air purifiers, drum screens, and separators.

To achieve a suitable product storage moisture, the majority of both grain varieties and oleaginous fruits require drying. The Bühler EcoDry drying systems gently and efficiently bring the product the target moisture at which it can be stored, using a patented dryer design.

As soon as the product is stored in a silo or flat store, it requires monitoring. To detect hot spots, new silos are usually equipped with hanging sensors; whereas flat stores are equipped with 'measuring lances'. To ensure product quality, and have the ability to intervene in the event of critical fluctuations, the sensors must be monitored constantly. Bühler offers a new digital cloud solution for this purpose. With the PreMa mobile app, all sensor data can be viewed from anywhere, at any time, and in real time, on your smartphone. The data are logged, and provide the perfect solution for monitoring product quality in the silo. For this purpose, you can view a silo overview, a trend display, and hot spot visualization on your smartphone. Should a critical temperature increase occur, an



alarm is triggered according to preset limits; so that required measures such as cooling or relocation can be initiated immediately. Grain management digitization is therefore a key contributor to minimizing losses, increasing efficiency, and reducing costs.

#### PROJECTS DEVELOPED WITH BÜHLER GRAIN QUALITY & SUPPLY ARE SUCCESSFUL PROJECTS

Worldwide, Bühler has proven expertise in a large number of successfully implemented grain collection and storage projects. The spectrum ranges from small collection operations, to large-scale industrial solutions. Competence, and many years of experience, form the basis for a modular product portfolio that is geared to customer requirements throughout. An example of a particularly challenging project: In Dhaka, Bangladesh, Bühler designed, planned, and installed several industrial plants, from October 2014 to August 2017. This resulted in development of a plant for processing Bühler paddy into white rice, and also processing of wheat and red lentils, on an undeveloped, open riverside area. Ship collection of 600tph (tonnes per hour) of wheat and 250tph of paddy, lorry collection of wheat and lentils (150tph), as well as four paddy lorry collections, at 62tph each, are available. In addition to several Bühler drying lines (4 x 45tph of paddy rice and 3 x 28.5tph of parboiled rice), 22 steel silos — with a total capacity of 130,000 tonnes — are integrated via conveyors. The finished product is transferred via sack or shiploading.

Another example of a complete Bühler solution, is a collection point in open German countryside. Here, Bühler completed a 10,000-tonne storage capacity plant in 2017. Wheat, rape, maize and barley are stored in a combination of 11 steel silos. The fully automated system has a pre- and a main-cleaning line, dust extraction, drying systems and truck collection and loading, with a 150tph capacity. All the necessary machines were delivered by Bühler except the silos and the steel construction.





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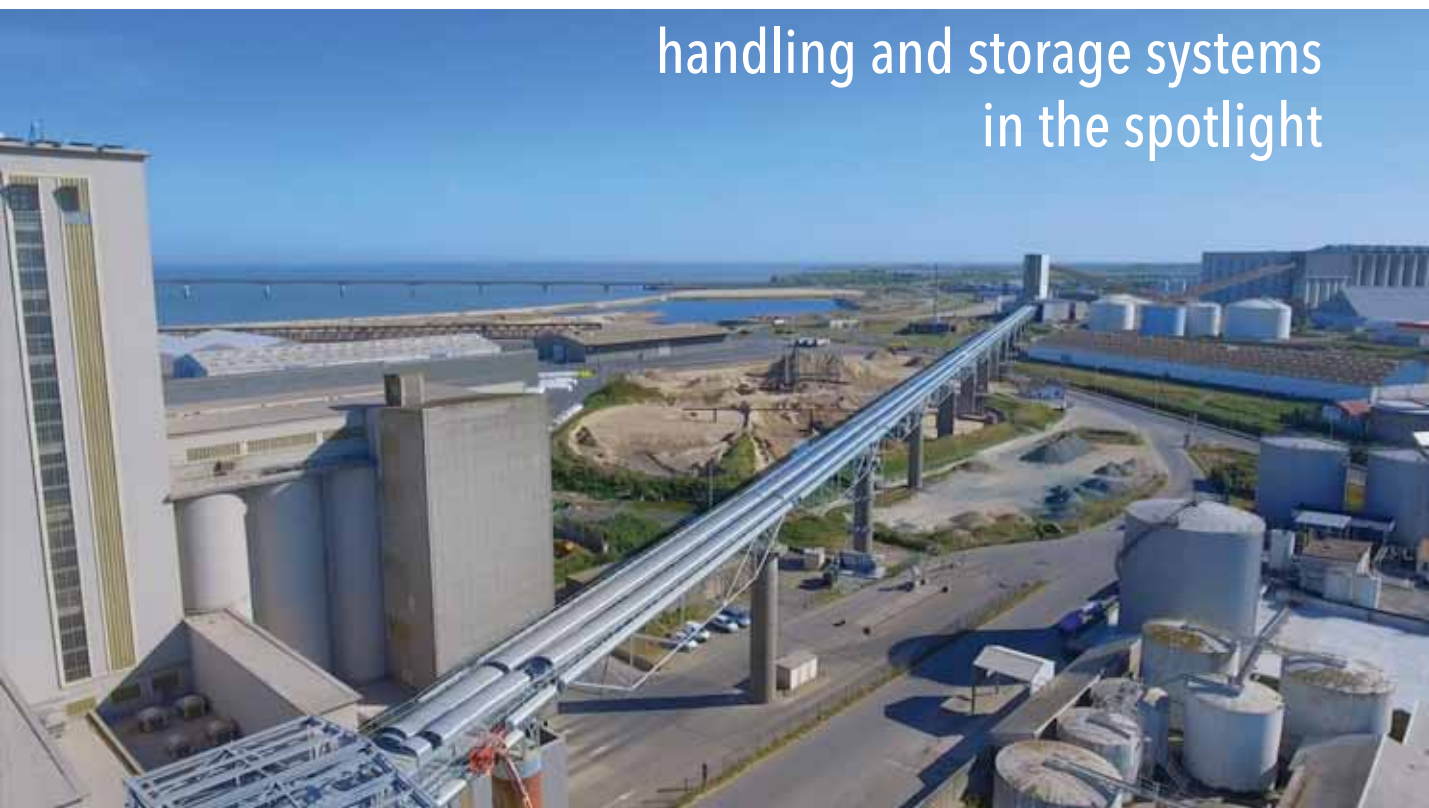
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# Going with the grain

handling and storage systems  
in the spotlight



Louise Dodds-Ely

## 'GRAINODUC' ushers in a new era for Sica Atlantique Group

The Sica Atlantique Group, the main operator at the Port of La Rochelle-Pallice in France, exports more than three million tonnes of cereals a year.

Increasing loading rates at a port is a

major factor in attracting users, as this makes it possible to reduce the length of vessel calls and associated potential demurrage costs. To improve competitiveness, SICA Atlantique Group has decided

to modernize its handling facilities.

Built in the mid-1970s, the metal 'tube' (GRAINODUC) linking the SICA Atlantic silos to the Lombard wharf has become an iconic element of La Pallice harbour. This

element, with a diameter of 3m, is equipped with a long conveyor belt (700m), which can be used to feed shiploading gantry cranes at a nominal rate of 1,000tph (tonnes per hour).

For safety reasons, and in order to secure and double the lines, permitting both a doubling of loading rates and continuous loading in the event of a default in one of the two conveyors, Sica Atlantique Group has decided to replace its GRAINODUC.

With this in mind, the Sica Atlantique Group approached RBL-REI.

A global bulk handling company, RBL-REI is a renowned partner in the port, cereals and mining industries among others.

With its main headquarters located in Paris and Angers (Loire



- ❖ no or little civil engineering; the two conveyors had to be fitted on the existing concrete pile without additional loads; and
- ❖ shutdown time for removal of the old conveyor belt and restarting one of the two lines will be a maximum of eight weeks.

RBL-REI took up the challenge and proposed a double conveyor equipped with a structure in PRS structure (welded steel sections) with a subtended arc, in sections of up to 50m.

As a result the two new lines weigh only

Valley area), RBL-REI has several facilities in France and overseas.

The company is widely represented throughout the world with commercial agencies allowing it to consider large-scale projects.

The Sica Atlantique Group handed RBL-REI 'carte blanche' for the design of the new GRAINODUC, with the following specifications:

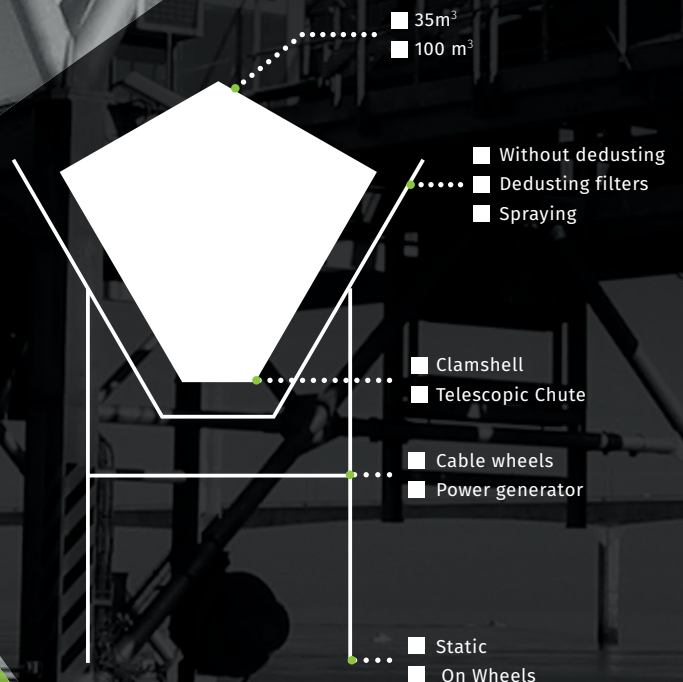
- ❖ install two conveyors (1,500tph, 1,000tph) in place of the current conveyor;
- ❖ completely elevated conveyor culminating in a height of up to 22m, whilst maintaining the current clearance under the conveyor;



# RBL REI BULK UNDER CONTROL MULTI-BULK HOPPER

GENERAL CHARACTERISTIC		
Util capacity	35m <sup>3</sup>	100m <sup>3</sup>
Feeding height without dedusting filters or with spraying	10m	11.5m
Feeding height with dedusting filters	12m	13m
Opening diameter without dedusting filters or with spraying	7m	9.5m
Opening diameter with dedusting filters	5.5m	8m

-   
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-   
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700kg/m compared to the 1,000kg/m that the previous tube conveyor weighed.

To preserve the existing road templates, metal trestles have been erected above the concrete supports to compensate for the additional height (about 4m)

In order to limit wind loads on its structure, RBL-REI installed deflectors at the welded structural core as well as a lowered cover, giving an 'aircraft wing' profile to the conveyors.

Last but not least, from the shutdown time from removal of the original conveyor to the restarting of one of the two new ones could not exceed eight weeks.

To meet this deadline, and in order not to disturb the operation of the harbour, RBL-REI performed a trial assembly of all the sections on the ground in a dedicated area.

The sections were then sent to their place of assembly thanks to motorized, radio-controlled carriages. Lifting is performed by mobile cranes (up to 450t). The result is that the entire conveyor was assembled in less than four weeks, and four weeks later shiploading recommenced. The second line started up one month later.

With the modernization of this equipment, the Sica Atlantique Group can load ships at up to 2,500tph or load two types of cereals simultaneously.



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## VIGAN's key logistical role in the world's food chain

Billions of tonnes of cereals circulate around the world every year to feed the world's growing population.

Grains are mainly carried in bulk by sea and via inland fluvial transport, and are then transported overland by truck or train, bringing the cargo to its final destination. This is where VIGAN comes in, by offering continuous ship-unloading and loading solutions, whether pneumatic or mechanic means.

The main products handled by VIGAN equipment are all types of cereals and oilseeds, raw materials for animal feeding and products such as alumina, soda ash, chemicals and/or fertilizers.

Free-flowing characteristics are important, but VIGAN has also developed technologies to handle products which may be slightly compacted, such as soybean meal. VIGAN's expertise also includes the handling of delicate products such as malt for breweries and cocoa beans for chocolate, as well as wood pellets and many other free-flowing cargoes.

Indeed, VIGAN's special handling technology preserves all the physical and

chemical characteristics of the products during their transport.

Challenges for the grain bulk logistics are: energy, labour and demurrage costs, while safeguarding the quality of the discharged product and ensuring reliability over long period in demanding environment. VIGAN offers tailor-made solutions to meet these challenges.

VIGAN's equipment offers a fast return on investment by optimizing the operational costs:

- ❖ low energy consumption: 0.6–0.8kW per unloaded tonne;
- ❖ highly efficient cleaning of the vessel or barge hold: maximizing discharge efficiency (75% and more) leads to minimized demurrage costs;
- ❖ reliability results in low maintenance

cost and time out reduction;

- ❖ durability (machines with a life expectancy of 30 years and more) and cost efficiency lead to long-term investment with short term pay-back; and
- ❖ ease of operation (simple high tech) means limited manpower and low operating cost.

Since its creation in 1968, VIGAN has



*VIGAN pneumatic ship and barge unloaders supplied in 1997 and 2015 in Batangas.*



*Two VIGAN NIV 600 pneumatic ship unloaders installed in 2018 in Calaca.*

honed its CSU (continuous ship unloader) expertise, as well as its know-how and is thus able to advise its customers worldwide about efficient unloading operations.

The vast majority — 99% — of VIGAN's production is for the export market, helping not fewer than 100 countries to feed their populations.

**VIGAN: PARTNER FOR THE PHILIPPINES**

While it has an important place in global rice and corn production, the Philippines is not self-sufficient in terms of wheat, due to its climatic features, and it is therefore among the world's leading wheat importers.

Rice is the main staple food of the population, currently estimated at 105 million people, but wheat and protein are on the rise in the diet of the Filipino consumer.

VIGAN entered the market in 1989 with the sale of a portable grain pump type 80.

Since then, VIGAN has sold 22 machines in the Philippines, among which five are heavy-duty machines.

In 2015, VIGAN installed a pneumatic unloader for barges in Batangas (Philippines) for the company Suntrak Corporation, a grain logistics company affiliate of Monde Denmark Nissin Biscuit, one of the country's leading manufacturers of instant noodles, biscuits products and packaged baked goods.

The pneumatic barge unloader has a capacity of 250tph (tonnes per hour), and is equipped with a motor of 130kW (0.52kWh/t).

The former VIGAN gantry that was installed on the same site in 1997 is still in operation. VIGAN recently equipped it with a frequency inverter allowing a power

consumption saving of ±20%.

Local soybean meal production remains insignificant relative to overall need and the industry is also dependent on imports.

This year, VIGAN has installed two NIV 600tph/500kW pneumatic grain ship-unloaders at Calaca Harvest Terminal Inc. in Calaca, for the discharge of grain and soy meal from vessels up to 50,000dwt, with a boom length of 30m, calculated from a slewing centre.

These machines are mounted on a mobile self-propelled gantry on rails, with a rail span of 12 metres. The gantry is equipped with a chain conveyor of 18 metres long with two outlets and two chutes for the feeding of two wharf conveyors.

The machine is equipped with two electric motors of 250kW each, with two VIGAN centrifugal four-stage turbo blowers with direct coupling between turbo and motor axle. The turbo blower electrical motors are driven by a frequency inverter.

**A 'CUTTING NOZZLE' FOR SOYBEAN MEAL HANDLING**

For non-free flowing materials, such as soybean meal, VIGAN highly recommends the use of its cutting nozzle. This cutting head is a very efficient tool and requires a minimum amount of power. The standard suction nozzle is designed for free flowing products naturally flowing to the suction point allowing high unloading efficiency. In order to achieve good performances on non-free flowing materials, a cutting nozzle should be used. This cutting head is an efficient tool to disintegrate the caked product and restore its flow properties. It requires low power because of the reduced but active action surface. This cutting tool usually operates on meals and other cargoes with bad flowing behaviour, in conjunction with a front-end loader breaking the product walls and pushing less flowing material all around the nozzle.

The cutting nozzle is supplied with a support on the wharf for quick disconnection from the vertical telescopic.



*Cutting nozzle especially designed for Calaca Harvest Terminal Inc.*



# Yuzhny Commercial Sea Port expands capabilities to include grain cargoes



Ukrainian state company Yuzhny Commercial Sea Port is renowned for its handling of ore, iron ore and coal. It has handled more vessels and cargo than any other port in Ukraine.

Dredging works have increased draught significantly, with the result that the first Capesize vessel was handled at the port in 2015. Today, the state company handles Newcastlemax vessels on a regular basis. Moreover, the port is the only one that accommodates large-capacity vessels. It is to the merit of all the employees of the port, who built and developed the company.

The port now aims to expand the range of cargoes that it handles, and this year it embarked on new plans to handle grain cargoes.

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## Fabric solutions for flat storage: keeping dry cargo dry in a fabric building

When it comes to storing grain and other bulk products, flat storage solutions typically offer increased capacity and ease of handling than vertical storage options. The best buildings do more than just provide an enclosed flat surface — they are optimized with the capability to support cranes, conveyors, other loading equipment and conveyors.

Fabric buildings for flat storage offer short-term and long-term benefits for the building owner, resulting in simplified processes and increased profits.

### SMITHFIELD FOODS — A CASE STUDY

A recent example is an ingredient storage facility erected in Rose Hill, North Carolina, for Smithfield Foods. When business needs meant the need for a new facility to store soft stock, it chose a fabric



*Photo: courtesy Legacy Building Solutions.*

building. A steep roof pitch and straight sidewalls combine to give the building a peak height of 79 feet. The conveying

and inspections on the system.

Another advantage of the Legacy building design is the interior fabric liner. The liner, also made of fabric, is permanently attached to the inside of the building frames. The liner keeps dust from settling on the building frames, which prevents damage to the frame and reduces the amount of dust in the building. Controlling the dust also cuts the risk of combustion. In corrosive applications, the liner provides a non-corrosive barrier between the material stored and the frames.

Legacy's team added a passive ventilation system to provide airflow throughout the building, which helps prevent spoilage and product damage. Fresh air intake is provided by overhangs with mesh soffit. The gravity system keeps cool air flowing in through the eaves and warm air exhausting out peak vents, keeping cooler air closer to the occupied level of the structure.

Cast-in-place concrete walls serve as the foundation of the building and increase the sidewall strength, allowing soft stock to pile right up to the edges of the



*Photo: courtesy Legacy Building Solutions.*

building by Legacy Building Solutions.

"We needed a flat storage solution that was accessible via mechanical means for manipulation," said Katie Elmer, corporate engineer at Smithfield. Some of the soft stock used to create hog feed — including distillers grain and soybean meal — is compressible and does not flow easily out of traditional vertical silos.

Another consideration is transloading. The product is delivered by rail, therefore the new facility needed to accommodate a large volume of material and a conveyance system to receive product.

Legacy's buildings stood out to the staff at Smithfield for several reasons. The design flexibility of the rigid steel frame meant all 60,000ft<sup>2</sup> are unobstructed and available for storage — in this case, four piles each 53 feet high, for a total of 20,000 tonnes of stored product.

The 53-foot piles and loading equipment also had to be accommodated by the

equipment is suspended from the roof frame to keep the storage area clear of obstructions.

Mechanical systems are accessible via catwalk and egress stairs, which are attached to the building frame. This access allows staff to perform regular maintenance



*Photo: courtesy Legacy Building Solutions.*

structure. Smithfield uses concrete jersey walls inside the building to separate products while maintaining the clearspan area required for storing material and manoeuvring heavy equipment. "Typically there will be two products in the building, but using the jersey wall barriers allows us to store a third product as needed," said Elmer.

*Photo: courtesy Legacy Building Solutions.*



### OTHER ADVANTAGES OF FLAT STORAGE

Flat storage buildings give the business owner flexibility to use the structure in multiple ways. Many choose to store and maintain vehicles and machinery under the cover of the building. Loading and unloading is simplified with the capability to add conveyors and cranes, and to allow trucks to drive into the enclosure.

Legacy buildings in particular optimize bulk storage. Many of the buildings use pre-cast concrete panels to create bins, which can be reconfigured as business needs change.

In corrosive environments, such as fertilizer, salt or port storage, the fabric buildings on a rigid steel frame last longer than other building types. Legacy's exclusive ExxoTec™ PVC fabric has non-corrosive properties. The solid steel frames are hot dip galvanized to withstand constant exposure to corrosive elements. A liner, such as the one used by Smithfield Foods, further enhances the non-corrosive properties of the building by keeping harsh material completely out of contact with frame members.

Ease of construction is another feature of Legacy's buildings. In-house teams handle all aspects of building design and construction. Factory-trained crews travel to your location to handle unloading, building erection and site clean-up.

Bulk material storage can be a lucrative industry. When customers opt for infrastructure designed around their operations, they are able to ease daily pain points and ultimately increase profitability. Legacy Building Solutions provides the buildings that its customers need to make their operations run more smoothly and profitably.

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## Grain: a cornerstone of Buttimer's business since the beginning



### GRAIN HANDLING SPECIALISTS

Grain handling has been the cornerstone of Buttimer Engineering since its inception in 1978, originally providing equipment exclusively for the handling of bulk dairy and grain products. Buttimer can now boast four decades of experience in the design and supply of mechanical handling systems for grain and agri-industry applications. From the fabrication of bespoke pieces of equipment to the design and installation of complete turnkey materials handling systems, Buttimer's in-house design team and on-site engineers have a wealth of knowledge and practical experience of providing tailored solutions to agri-industry sectors including malting, brewing, food processing, animal feed milling and energy crops. Delivering projects for clients such as Dairygold, Diageo and Bunge, the diversity and depth of Buttimer's grain handling expertise makes the company an ideal partner in the development and installation of grain handling systems.



### GRAIN PROCESSING & STORAGE

Buttimer designs equipment and mechanical handling systems for a diverse range of grain products, including but not limited to: wheat, barley, maize (corn), rice, rapeseed and rapeseed meal, soya beans and soybean meal, coffee, food powders, wood fibres, pellets and other biomass. Each system is designed to complement the characteristics of the handled dry bulk product, and the throughput and processing requirements of the client. Some processing applications installed include:

drying, de-stoning, cleaning, milling, blending, pelleting (cubing) and treating as well as the required belt or chain conveying, bucket elevators, hoppers and loading and unloading equipment to rail, road, ship or other logistics systems.

Systems can be designed with full dust control, aspiration systems, ATEX and fire safety protocols to the specification of the grain's characteristics and client's

process. Storage options include steel silos, concrete silos and flat-stores. Each dry bulk product, and client's processing requirements will require a unique handling system; Buttimer works with clients to deliver the grain processing, storage and out-loading system that meets those unique requirements.

### EQUIPMENT SUPPLY

The range of equipment supplied by Buttimer is quite comprehensive and covers all aspects of the grain handling process. This includes equipment for;



### MECHANICAL CONVEYING

Buttimer supplies a range of belt, chain, bucket and screw conveyors for the handling of dry bulk product. With motors, gears, belts and components customized to the client's process, Buttimer endeavours to provide the right unit based on requirements, prioritizing efficiency and ease of maintenance.

### PNEUMATIC CONVEYING

Another form of conveying, Buttimer offers a selection of rotary valves, pneumatic conveying plant, two-way diverters and automatic filtering systems for handling powders and dry bulk products. Buttimer can provide the complete range of components including slide-gates, ducting and air blowers.

### SORTING & SEPARATING

This includes specialist equipment for sorting or separating bulk product based on particle size, weight, colour or other commodity characteristics. Equipment provided includes gravity separators, magnetic separators and laser colour variance detectors.

### MOBILE FUME & DUST EXTRACTION

A range of mobile vacuum extractors with customizable, extendable and adjustable extraction tubes and arms. Perfect for localized removal of fumes, vapours, fine dust or odours: easily operated and then folded away for effective and flexible extraction.

### INSTALLED DUST CONTROL

Industrial dust control systems including extraction filters, ducting and air pressure systems are available. The range of filtration solutions includes bag and cartridge type dust capture. Fully customizable extraction units can be designed for aspiration in grain, biomass, pharmaceutical, recycling, metals and similar sectors

### SAMPLE PROJECTS

Over the past 40 years, Buttimer has completed provided equipment for many large projects in the grain handling sector for a number of high profile clients, such as;

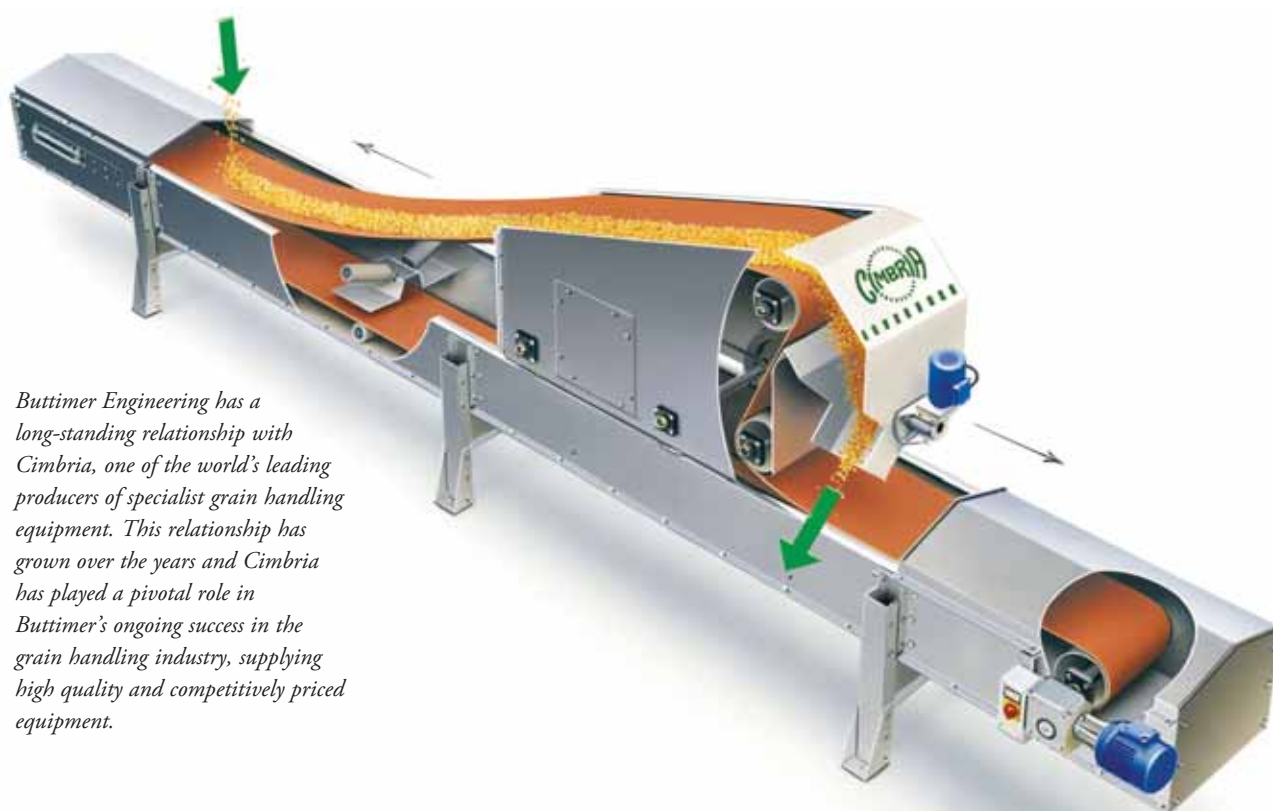
#### DIAGEO

Buttimer provided design, procurement, fabrication and installation in Dublin's famous St. James Gate brewery, where rice,

malt barley and roasted malt barley are handled. The turnkey solution developed includes; bulk intakes, a bin block of 13 storage bins, five cleaning and de-stoning lines (including weighing, aspiration and process equipment), a rice grinding line and roller mill. Buttimer provided the full detailed design and supply of all equipment as well as on-site installation which included equipment support structures, maintenance and project management.

#### BUNGE POLAND

Bunge is a global producer and trader of food oils & grains. The import/export facility in Swinoujscie, Poland, includes a large flat storage facility for soybean meal and rapeseed meal, which also comprises a fully aspirated system for loading and unloading ships, rails and trucks, demonstrating very high throughput efficiency for a low-density bulk product. It includes a ship unloading capability of 800tph (tonnes per hour) of soybean meal, shiploading of 600tph of rapeseed meal, a handling and storage capacity of 50,000 tonnes. The fully aspirated turnkey project was designed and project managed by Buttimer.



*Buttimer Engineering has a long-standing relationship with Cimbria, one of the world's leading producers of specialist grain handling equipment. This relationship has grown over the years and Cimbria has played a pivotal role in Buttimer's ongoing success in the grain handling industry, supplying high quality and competitively priced equipment.*

## Vortex Ship Loading Spout for handling grain materials

The Vortex Ship Loading Spout is intended for loading dry materials into cargo ships, bulk carriers, barges, and large stockpiling operations. With load rate capacities capable of 120,000 bushels/hr — the equivalent of: 70m<sup>3</sup>/min (CMM); 2,448ft<sup>3</sup>/min (CFM); 4,160m<sup>3</sup>/hr (CMH); 146,940ft<sup>3</sup>/hr (CFH); 3,265,865kg/h; 7,200,000 lb/hr, and 3,265tph (metric tonnes per hour); and 3,600 tons/hour — the Vortex Ship Loading Spout is among the industry's highest performing loading solutions.

The Vortex Ship Loading Spout is capable of handling bulk raw agricultural commodities, including corn, wheat, soybeans and soybean meal, among others. The spout is also capable of handling processed grain materials, such as flour, animal feed and others.

### GRAIN DUST: HEALTH & SAFETY CONCERNS

Across grain industries, companies are facing more stringent regulations as they relate to potentially hazardous dusts. Extensive research performed by health & safety agencies worldwide has revealed that risks, as they relate to dust emissions and exposure at the point of loading and transport, are even more severe than previously recorded. These health and safety concerns were found to not only impact workers at the port, but also, the general public's nearby neighbourhoods, waterways, and other local ecosystems.

According to health & safety agency standards, grain dusts are classified as nuisance dusts — meaning, the airborne particles have minimal harmful effects on the lungs, when exposures are kept to reasonable limits. However, the type and size of dust determines how toxic it may be. Common symptoms of nuisance dust



exposure include coughing, sneezing and eye irritation, among others. In some instances, breathing high concentrations of dust over a long period of time can reduce lung function and may contribute to

chronic bronchitis, or other lung and/or heart conditions.

Furthermore, dust accumulation at the port can create numerous safety issues. Concentrations of dust on decks, rungs and



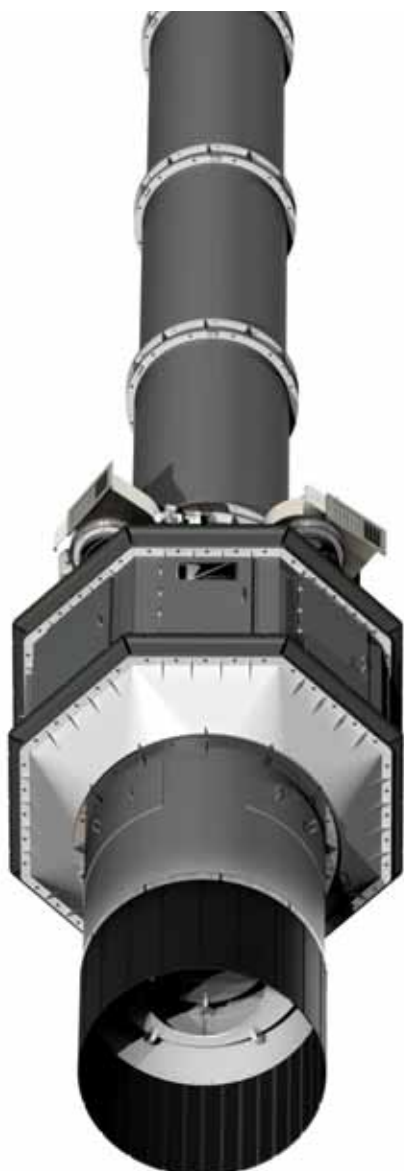
handrails can cause employees to slip and/or fall as they move throughout the port using walkways, steps, ladders, catwalks, and other surfaces. Dust-related accidents such as these will cause injuries and ailments, which lead to workers' compensation, short- and long-term disabilities, litigation, penalties/fines from health & safety agencies, and many other expensive repercussions.

Rather than facing these negligent expenses later, investments can be made in well-designed ship and barge loading systems.

### VORTEX SHIP LOADING SPOUT: WHY THE GRAIN INDUSTRIES NEED IT

The Vortex Ship Loading Spout is specifically designed to manage displaced air and fugitive dusts generated during the loading process. Its unique design features offer several key benefits:

- ❖ **Telescopic, tube-in-tube design:** allows the unit to be fully extended down into the waiting vessel below to perform loading operations, and also



allows the unit to be fully retracted to allow proper clearance for vessels entering and departing port. To further prevent dusting to atmosphere, the top flange of each telescoping tube is sealed with layered plastic and compressed rubber.

- ❖ **Discharge filtration system:** at the Ship Loading Spout's outlet, a Discharge Filtration System collects fugitive dusts in a series of pleated filter cartridges by means of air withdrawal. Throughout the loading process, reverse pulse jets continuously purge collected dusts back out of the filter cartridges and back into the load. This allows dusts to be loaded out alongside materials, rather than being disposed of as waste.
- ❖ **Dust Control Skirt:** a Dust Control Skirt further assists in containing displaced air and fugitive dusts. Throughout the loading process, the Dust Control Skirt encompasses the peak of the material pile. As the material pile grows, the Ship Loading Spout gradually retracts. The purpose of a Dust Control Skirt is to smother fugitive dusts at the point of loading, so that they are prevented from aspirating and escaping to atmosphere.
- ❖ **Materials of construction:** to address the abrasiveness of raw grain materials, Vortex offers several options for constructing the telescoping tubes and other material contact areas. Metal materials of construction options include 304 and/or 316L stainless steel, A36 mild steel, 400 BHN (minimum) abrasion-resistant steel, ceramic-lined steel, and chromium carbide. By constructing from such durable metal materials, the Ship Loading Spout is protected from the elements of its surrounding environment and is provided stability in applications with especially long vertical travel distances. For added durability and protection against environmental factors, the exterior of each telescoping tube is finished with industrial-grade polyurethane coating.
- ❖ **Ratings:** each Vortex Ship Loading Spout is equipped with components appropriately rated for the environment in which they will be utilized.

Because Vortex Ship Loading Spouts require significant engineering work to ensure their success in each application, they are not available in standard sizes. Therefore, Vortex Ship Loading Spouts are designed and manufactured on a case-by-case basis.



### ABOUT VORTEX

For 40 years, Vortex has designed and manufactured slide gates, diverters, iris valves and loading solutions specifically for dry bulk material handling. Though Vortex equipment is used worldwide by several industries today, the company was founded and is deep-rooted in its focus on supplying to the milling and grain industries.

Vortex stays true to a design philosophy of: "Provide value-added products which are specifically designed for end users in-the-field. Maintain a technical focus on developing innovative technologies that compensate for wear, require minimal spare parts, provide easy in-line maintenance and fulfill longer service lives than market alternatives. In turn, Vortex products will improve process efficiencies, establish long-term reliability, and improve workplace safety by ensuring dust-free environments. Innovations will continue until they result in a product that will out-perform and outlast typical components found in the industry today."

## Bedeschi equipment for Transgrainterminal project at Ukrainian port



*Bedeschi shiploader.*

Bedeschi has a long history as a supplier in the bulk handling sector. Thanks to its vast experience, it is able to produce a wide range of shiploaders for on-shore installations. It also manufactures transshippers, which are used when the loading/unloading processes — due to restrictions at the port — have to be carried out away from the port.

Each shiploader is designed to fit the specific project requirements and the client's specific needs. This is why Bedeschi supplies customized shiploaders — to maximize efficiency according to the features of each idiosyncratic project. Some shiploaders therefore have a shuttle-type delivery boom with reversible belts, while others have a retractable mechanism capable of extending outreach. Others have been fitted with a straight delivery spout, while some have incorporated a distributing chute designed to deliver cargo into all parts of a ship's hold in order to avoid uneven loading.

Bedeschi offers a wide range of case studies to all its potential customers, to demonstrate the care and attention that the company pays to all of its tasks as part

of its mission to meet the specific requirements of each project.

### GRAIN TERMINAL PROJECT

Marine Trade Port of Chernomorsk, which is located on the north-western shore of Black Sea and to the south-west from Odessa, will benefit from a new grain terminal in 2018.

Kernel LLC, one of the largest Ukrainian producers, exporters of wheat and suppliers of agricultural products to the world market, planned to increase its capacity to store goods simultaneously.

The loading system comprises two lines. Each line includes a travelling shiploader, mounted on rails, and equipped with a tripper conveyor to elevate the material to the loader boom. The tripper is fed by a dock conveyor, which extends for 300m and is positioned parallel to the moored vessel. After a single hold of the ship is filled, the loader is moved to the next operating zone, travelling at a rate of approximately 40m per minute. The loading capacity for each line is equal to 2,200tph (tonnes per hour) and the each shiploader is designed to satisfy the

required load capacity permitted for each wheel, on the exiting rails installed on the pier.

The design allows the boom to be positioned over each of the ship's holds, managed by a single operator with remote control, and without the need to reposition the vessel. Set-up time between loading holds of the ship is typically reduced, thus maximizing throughput of material to the loader and minimizing the idle time of all interlocked auxiliary equipment and manpower operating upstream.

The combination of the shiploader's ability to travel along the ship's side, the vertical boom motion and the kick-in/kick-out technique of the loading spout allows for loading under heavy duty conditions for vessels from 2,000dwt up to 100,000dwt.

All the machines are equipped with dust control systems, provided with three different types of filters (one each transfer point) and a telescopic chute that makes it possible to regulate material throughput in such a manner that the material velocity at the outlet of the spout is only low and therefore no dust will be present at the spout outlet.



# Bulk conveyors: really going somewhere



Roy Hill iron ore mining, rail and port project in the Pilbara, West Australia.

Louise Dodds-Ely

## Svendborg Brakes systems in conveyor applications

Since 1989, Svendborg Brakes, part of Altra Industrial Motion Corp., has been recognized as a prominent global expert in intelligent braking solutions for industrial applications. Extensive application knowledge, innovative design, fast prototyping and exhaustive testing ensure that customers get the most technically advanced, most durable and safest braking systems to meet their specific requirements.

Svendborg's wide range of highly engineered products including hydraulic brakes and power units, thruster brakes, soft braking controls and couplings are hard at work in key markets including renewable energy, mining, hydropower, cranes and oil & gas, and marine & offshore. Svendborg Brakes' products can be found on applications such as wind and tidal turbines, overland conveyors, propulsion systems, deck equipment, hoists, drawworks, elevators & escalators and dam turbines.

### A FOCUS ON MINING CONVEYOR SYSTEMS

Based on previous successful collaborations, many of the world's leading global mine conveyor OEMs and mine engineering consultants routinely rely on Svendborg Brakes to provide optimal braking solutions for their customers' most challenging mine, yard and port conveyor applications.

Tyler Calvert, Application Engineer at Svendborg Brakes, said: "Our customers directly benefit from our deep understanding of entire mine conveyor systems. Our familiarity with the machinery and the knowledge that brakes form part of a much larger interconnected installation ensure the development of state-of-the-art products that increase both reliability and cost-effectiveness."

Unlike some other brake manufacturers, Svendborg has the capability to deliver complete, custom-engineered braking package solutions for each conveyor within a facility. Braking packages

typically include proven failsafe caliper brakes that provide parking and emergency stopping functionality in case of power failure. All brake models are designed, tested and produced to cope with the extreme working conditions of long-distance downhill, uphill and overland mine conveyor systems.

Svendborg's next-generation, SOBO® iQ controllers, along with SOBO iQ hydraulic power units (built in-house), are key components included to provide soft and predictable conveyor braking control. The industry-leading SOBO iQ (soft-braking) controller combines cutting-edge technologies to provide significant flexibility, safety and durability on mine conveyors. The controller features three-state digital modulation and a revolutionary dual-loop PI control (pressure/speed).

With installations on most of the world's largest incline and decline mining conveyors in Europe, Chile, Peru, Mexico, North America, South Africa and Australia,

Svendborg's SOBO brand is recognized worldwide for outstanding performance in the field.

Brake discs and hub assemblies are often supplied as part of system packages.

**ROY HILL IRON ORE MINING, RAIL AND PORT PROJECT**

Svendborg Brakes was chosen to supply braking solutions for conveyors at the Roy Hill iron ore mining, rail and port project in the Pilbara, West Australia. Svendborg technologies were incorporated on a variety of Roy Hill conveyor applications including those listed below.

- ❖ **overland conveyor (radial stacker/feeder):** BSFI 3000 brakes were installed on the head drive shaft to dynamically stop the conveyor during an emergency or power failure and function as a parking brake when the conveyor is not in use.

BSFI 200 & 300 Series braking systems were supplied for the applications listed below. The brakes were installed on the high-speed side of the conveyor head drive shaft, between the electric drive motor and the gearbox. They dynamically stop the conveyors during an emergency or power failure and function as a parking brake when the conveyors are not in use.

- ❖ five scrubber conveyors (inclined); and
- ❖ four tertiary crusher conveyors (inclined).

**WIGGINS ISLAND COAL EXPORT TERMINAL (WICET)**

Svendborg Brakes was selected to provide conveyor braking solutions for use throughout the \$2.6 billion Wiggins Island Coal Export Terminal (WICET) in Queensland, Australia.

Svendborg technologies were incorporated on the following applications:

- ❖ **shiploader luff & shuttle winches:** BSFI 3120 brakes (offshore specification) were installed directly on the winch drums to hold the position of the boom and the shuttle on the boom

during coal loading onto a ship. The boom can be raised and lowered and the shuttle can be retracted or extended depending on the type of ship being loaded.

- ❖ **shiploader luff winch & shuttle winch drives:** BSFI 212 brakes hold the luff winch drive in position when not moving the boom. BSFI 205 brakes hold the shuttle winch drive in position when not extending or retracting the shuttle on the boom.
- ❖ **operator's cabin:** A BSFI 3120 brake was installed directly on the winch to hold the cabin in position during operation. The cabin can be raised and lowered for optimal viewing.

BSFI 3000 Series braking systems were also supplied for the applications listed below. The brakes were installed directly on the conveyor tail pulleys to dynamically stop the conveyors during an emergency or power failure and function as parking brakes when the conveyors are not in use.

- ❖ wharf & jetty conveyors (offshore brake specification);
- ❖ stockyard, reclaim 1 and reclaim 2 conveyors; and
- ❖ overland conveyor.

**ABOUT SVENDBORG BRAKES**

Svendborg Brakes' ability to design complete packaged braking solutions, including the state-of-the-art SOBO iQ controller, a wide range of long-lasting brakes, custom hydraulic power units, and other quality components, make them a leading expert in the mine conveyor industry. Extensive support provided by an unmatched global network of local service centres makes Svendborg a popular choice for mine operators worldwide.



*Wiggins Island Coal Export Terminal (WICET) in Queensland, Australia.*

*Svendborg Brakes provides complete custom-designed packaged braking solutions, including the state-of-the-art SOBO® iQ controllers, a wide range of long-lasting brakes, custom hydraulic power units and other quality components.*



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**LIEBHERR**

## Willowton installs new TAKRAF Africa-designed Redler conveyors

Key equipment supplier TAKRAF Africa, part of the global mining, material handling and minerals processing group, TAKRAF, is supplying six new-design Redler chain conveyors to the Willowton Group's factory in Isando, Gauteng – South Africa. This order, placed in April 2018, makes the Willowton Group the first company to install these new conveyors, which are specifically designed in-house by TAKRAF Africa, and which are a breakthrough development for the FMCG market.

Combining the proven Redler brand with a lighter, more cost-effective design of the casing, the conveyors utilize the high quality Redler chain housed in a structure manufactured from laser-cut, relatively light-weight plate-work. This unique fabrication approach has eliminated the expensive and time-consuming welding process, enabling the delivery time to be reduced by up to four weeks. Furthermore, laser cut plates eliminate boilermaker tolerances and ensure a perfect fit on site.

In addition, TAKRAF Africa is now able to assemble the conveyors utilizing its in-house capacity, providing a valuable upskilling opportunity for its employees.

The conveyors were ordered by the Willowton Group as part of its expansion programme for its plant in Isando, with this new design conveyor being first demonstrated to the company using a test casing. The longest conveyor is 40m in length, with the other five ranging between 20 to 24m long, all conveying sunflower products at 25tph (tonnes per hour). TAKRAF Africa's scope of work covered the design and fabrication of this equipment.

TAKRAF Africa is the exclusive licence holder/supplier in Southern Africa of the trademarked Redler range of equipment.

Through its more than 40-year business relationship with the Willowton Group, TAKRAF Africa has supplied more than 150 machines to the group across its various operations. This includes more than 40 to the Willowton Group plant in Pietermaritzburg in KwaZulu-Natal and more than 100

Redler machines to the Isando plant. The machines include both Redler en-masse chain conveyors and chain elevators.

The Willowton Group, South Africa's largest sunflower seed crusher, operates across South Africa producing a wide range of products, including edible oils, margarines and spreads.

"TAKRAF Africa is proud that the Willowton Group, a loyal and valued client, was the first recipient of this important new development in conveyors, one which enables the FMCG market to enjoy the benefits of the renowned Redler conveyor but tailored to the needs of the sector," says Antonie le Roux, Specialised Handling Manager, TAKRAF Africa.

TAKRAF Africa, previously known as Bateman Engineered Technologies prior to Tenova acquiring the Bateman Group in 2012, has supplied more than 5,000 Redler chain elevators and chain conveyors throughout Southern Africa over the past 40 plus years.

Proven over decades, Redler machines convey a wide range of solids, including coal, woodchips, sand, lime, cement, fly-ash, sunflower seeds, maize, wheat, flour, grain and many more. They convey particulate solids cleanly, gently and economically by inducing material to move like a liquid

through dust-tight casings. As a result, these low maintenance systems ensure minimal product degradation, while the dust-tight casings protect the conveyed material and the environment from mutual contamination.

### ABOUT TAKRAF

TAKRAF, a Tenova company, is an integrated solutions provider to the global mining, bulk material handling, minerals processing and beneficiation industries, offering innovative technological solutions as well as process and commodity knowledge along the industry value chains. With the integration of the well-known DELKOR and Tenova Advanced Technologies (formerly Bateman Advanced Technologies) brand of products into TAKRAF as specialized product lines, the company's portfolio for the minerals processing and beneficiation sectors has been considerably enhanced.

### ABOUT TENOVA

Tenova, a Techint Group company, is a worldwide partner for innovative, reliable solutions in metals and mining. Leveraging a workforce of over 3,000 forward-thinking professionals located in 22 countries across five continents, Tenova designs technologies and develops services that help companies reduce costs, save energy, limit environmental impact and improve working conditions.

### ABOUT THE WILLOWTON GROUP

The Willowton Group has been in operation since 1970 and has grown to become South Africa's largest sunflower seed crusher, palm oil importer, as well as one of the leading competitors in the South African FMCG market.

The group operates across South Africa with manufacturing facilities in Pietermaritzburg, Johannesburg and Cape Town. A wide range of products encompasses edible oils, margarines and spreads, beauty, toilet & laundry soaps, candles, chocolate, baking and industrial fats. Well-known brands include, among others, Sunfoil, Sunshine D, D'Lite, Crown, Woodenspoon and most recently Allsome rice.





## World-class terminal operations made simple

**In actual fact terminal operations can be remarkably complex... it's our experience and expertise honed over four decades which makes it seem simple.**

The Nectar Group successfully operate a number of terminals around the world and offer a complete range of solutions from equipment and machinery sales to maintenance and service plans, not to mention terminal design and consultancy services... However, our solutions don't stop at the quayside; we also provide inland logistics to a multitude of local and international blue chip clients.

But most importantly what makes our services run like clockwork is our people... our 400 plus professionals

are highly skilled, trained and constantly assessed to ensure all latest technologies, governance and procedural steps are implemented to guarantee our solutions exceed with your expectations and requirements...

**...simple really.**



## REMA TIP TOP and VULCTECH: spectacular new development for Brazil

On behalf of REMA TIP TOP AG, VULCTECH GmbH has delivered an impressive innovation to Brazil. The REMA TIP TOP subsidiary from Altdorf specializes in the development and production of high-end vulcanizing presses for splicing of conveyor belts. With the new vulcanizing press Vulcpress IVE, VULCTECH GmbH has again succeeded in launching several promising new developments. The modular press system is not only perfectly adapted to its tropical application, it also relies on the unique control system so far, which guarantees stable and uniform splicing results even in large dimensions.

Vulcanizing presses, for splicing of fabric and steel cord reinforced conveyor belts, deliver extreme performance in the toughest conditions and in often inaccessible areas. Therefore, the REMA TIP TOP subsidiary VULCTECH is setting up its 'Vulcpress IVE (Innovative Vulcanizing Equipment)', which has been successful on the market since 2015, in such a way that the press can be modified to meet customer-specific requirements. The model that VULCTECH has now delivered to Brazil is also a special development. Even if the vulcanizing presses from VULCTECH are designed upon request, they all have one thing in common: they meet the highest safety standards. Technical Director Andreas Knothe emphasizes: "High pressure, high temperatures and large dimensions — with products as powerful as the Vulcpress IVE, absolute safety is essential. The vulcanizing press that we delivered to Brazil, like all others, was thoroughly tested. The TÜV has tested the mechanical-physical properties and confirmed the safety of the system."

### MODULAR, FLEXIBLE AND POWERFUL

As with all VULCTECH-IVE presses, the conveyor belt ends to be connected are pressed and heated between the pressure pad and the heating plate so that the vulcanization process is controlled — temperature and pressure create a durable splice of all rubber plies. Depending on the application, the pressure pads can be filled with air or a water glycol mixture. In the model that has now been delivered to Brazil, the water glycol mixture provides the necessary pressure. The insulating plates in the heating plates of the press used to heat the cords are not made of

plywood as usual. Instead, glass fibre-reinforced plastic was used, which much better suits the tropical climate of the application area. With its sophisticated, modular design, the press can vulcanize conveyor belts with widths of 1.25m to



2.45m. Overall, the system consists of many elements. For a 2.45m-wide conveyor belt, all elements are built together; if smaller belts have to be vulcanized, the press can be divided into two self-sufficient vulcanizing presses. In this special version the Vulcpress IVE can work with a maximum pressure of 16 bar.

### EVERYTHING UNDER CONTROL

The vulcanizing programmes in the press are fully automated. Knothe reports: "We generally value the highest level of user-friendliness in our systems. After cooling the press, the water glycol mixture from the pressure pads can be automatically extracted without any mechanical effort (no unplugging and replacing the pressure hoses). All processes are subject to precise monitoring, which we have visualized via WLAN". In real time, the user keeps track of the most important parameters such as outside temperature, humidity, temperature in the control cabinet and, of course, press pressure and vulcanization temperature. For complete documentation, the progress data is automatically recorded and can be released via USB port. This way, it is possible to trace the progress of a special vulcanization process even years later. Among other things, the VULCTECH Safety System ensures safety in the process. It protects the heating elements by only starting the press when all three phases are connected to the mains and the mains voltage is not exceeded or undercut by more than 10%.

### WORLD PREMIERE: PRECISE COORDINATION FOR PERFECT RESULTS

With all the high-quality components and

perfectly matched dimensions, it is the control system that makes the Vulcpress model so unique for Brazil — not only because of the control and safety devices, but above all because of a master-slave system for controlling the heating plates that has never been integrated into a vulcanizing press in the world before. In conventional vulcanizing presses, the heating plates of all control cabinets are started one after the other. Accordingly, they heat up with a time delay. In extreme cases, this means that while the conveyor-belt is still being heated in the middle, it is already cooling down again at the edge. This has a negative effect on the vulcanization

results. With the new Vulcpress IVE, however, a central master control cabinet is superordinated to the so-called slave control cabinets, which control four heating plates of the vulcanizing press each. It ensures perfect timing and precise co-ordination of the control cabinets so that all 36 installed heating plates build up temperature at the same time. The conveyor belt is evenly vulcanized over its entire width — for a splice of stable durability on which the operator can absolutely rely. Knothe looks to the future: "With the new system we are already setting standards. But we will continue to develop our presses and their control cabinets in the future so that we can soon report on the next groundbreaking innovation".

### ABOUT REMA TIP TOP

REMA TIP TOP is a global system provider of services and products in conveying and processing technology as well as tyre repair. The company has a global service network and offers a wide range of rubber products, rubber coatings and coatings for the industry as well as in the automotive sector. The company has built up a unique expertise in material development and industrial services for nearly a century and is active in the material processing, surface protection and automotive divisions.

At the end of the 2017 financial year, REMA TIP TOP generated sales of over one billion euros. The company employs more than 6,900 people worldwide and has more than 150 subsidiaries and affiliates — including well-known brands such as Dunlop Belting Products South Africa, Cobra/ Depreux and Asplit.

## Chinese conveyor giant supplies wide range of conveyors and accessories

Beijing Hao Sheng Transmission Technology Co. Ltd. (HSCD) is a professional manufacturer of mining equipment, and includes a wide range of conveyor systems — and associated products — within its service offering.

HSCD, based in Beijing, China, has a 473,000m<sup>2</sup> factory, of which the production building area covers 147,000m<sup>2</sup>, and has more than 260 employees.

The main products made by HSCD are: belt conveyor systems; conveyor rollers; conveyor pulleys; and conveyor belts. One of its most popular products is its wear-resistant composite roller.

Over the years, HSCD has focused on: strengthening independent innovation; continuous introduction, digestion and absorption of international advanced technology; and advanced technology, with a semi automated production line roller and a roller automatic production line.

HSCD has earned a strong reputation in China and internationally, especially for its development and production of large belt width, high belt speed, large capacity and special use belt conveyors. The company is now able to manufacture conveyors with a maximum belt width of 2.4m, which travel at speeds of 6.1m/s. Belt strength is 7,000N/mm, and capacities are up to 9,000tph (tonnes per hour), with belt conveyor lengths of more than 10km.

HSCD's belt conveyor — with advanced technology, excellent performance, first-class quality — is widely used in a number of national key projects. Customers include: Shanghai Baosteel; Gezhouba project; Caofeidian port; Qinhuangdao port; Jingtang Port; Datong coal mine; Zhungeer coal mine; Datang Power Plant; and Jidong Cement Factory. The company's contribution to such major projects has made an important contribution to the economy development.

The company's general fabric conveyor belt (EP, NN, CC), has a corrugated sidewall belt, steel cord belt, special fabric conveyor belt. It is resistant to high temperatures, acid, alkali, oil etc. These belt conveyors are widely used in ports, metallurgical, mining, coal, power, building materials and other industries.

Conveyor projects successfully completed by the company include:

- ❖ design and supply of nine sets of conveyor systems (length 216m) for Shenhua Wanlibuertai coal washing plant;
- ❖ design and supply of one conveyor system (length 2,626m) for Xiyuan Coal



*Datong coal mine is one of the many users of HSCD's equipment.*

- & Coke Co. Ltd.;
- ❖ design and supply of two sets of conveyor systems (width 1,200mm; length 846m) for Shanxi Coking;
- ❖ design and supply of 15 sets of conveyor systems (total length 2,092m) for CAS Coking Co., Brazil;
- ❖ design and supply of a conveyor system

- for ICDASBIGA power plant in Turkey;
- ❖ design and supply of 11 sets of conveyor systems (total length 1,173m) to Tianfeng Iron & Steel Co. Ltd.;
- ❖ design and supply of 14 sets of conveyor systems (total length 2,800m) for Malfrad cement plant in Yemen; and
- ❖ design and supply of 84 sets of conveyor systems (widths of 1,800mm and 2,000mm) for Nanjiang Coal Terminal.

HSCD's product line includes:

- ❖ belt conveyors;
- ❖ conveyor rollers;
- ❖ conveyor pulleys;
- ❖ conveyor belts;
- ❖ belt cleaners; and
- ❖ impact beds.



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## Doppelmayr undaunted by challenging conveyor requirements & tough terrain

Material transport systems by Doppelmayr span gorges, crossroads and rivers and transport the customer's material safely from A to B, also in difficult terrain. It does so reliably, economically and without unnecessary detours.

Doppelmayr Transport Technology GmbH is a member of the Doppelmayr group, a renowned provider of ropeway engineering solutions. Since its foundation in 1892, the group has been headquartered, in Wolfurt, Austria. The team at Doppelmayr Transport Technology GmbH have set themselves the goal of providing a solution for its customers' each and every material transport requirement with a wide range of innovative transport systems, and to open up new perspectives for the transport of bulk materials and unit loads.

Doppelmayr offers well thought-out transport systems all from one source: thoroughly planned, solidly manufactured and carefully assembled.

Doppelmayr, a pioneer and technology expert in ropeway engineering, has built more than 14,900 passenger and material transport systems in 95 countries. Customers from all over the world rely on state-of-the-art engineering from Doppelmayr to transport their bulk material or unit loads: from limestone in Sudan to pallets in Germany to gold ore in Mexico.

### SAFETY FIRST

Safety in bulk handling comprises many aspects: the commodity must safely and reliably reach its destination; the staff operating a transport system should work in a safe environment; and the health of people living or working in the immediate vicinity must not be compromised by the transport system in use.

RopeCon® is a continuous conveying transport system, consisting basically of a belt with corrugated side walls and integrated wheel sets which run on fixedly anchored track ropes guided over tower structures. The hauling function is performed by the belt.

This bulk material and unit load handling conveyor combines the benefits of well-proven ropeway technology with those of a conventional conveyor belt (hence the name RopeCon®). It offers conveying capacities of up to 20,000 tonnes per hour and conveying lengths of 20km in one flight. The system operates off the ground, thus minimizing space requirements and easily crossing buildings, roads, rivers, valleys or other obstacles. The perfect adaptation of



the conveyor to the natural terrain allows for a straight conveying line with only a minimum of line structures and tower distances of up to 1,500m.

The controls of the RopeCon® system can be integrated into the main controls of a logistics chain and the system works fully automatically. Furthermore, as the wheel sets are bolted to the belt, practically all moving items constantly return through the stations and can be easily maintained there. Thus, there is no need to go out into windy, cold or rainy weather to perform maintenance tasks. Works can be carried out in a safe workshop environment. In case the line has to be inspected, the system offers an inspection trolley, which travels along the top strand of track ropes. This system can be used to reach every point of the line easily and safely.

The implementation of the installation requires only a very narrow line corridor, even when installed in difficult terrain or in an area with already existing infrastructure.

It can cross roads or buildings and does not interfere with truck traffic. Furthermore, used as an alternative to truck traffic, it can improve safety, especially where roads are narrow and winding and road conditions are often icy.

When applied as an alternative to truck traffic the use of this conveyor also makes it possible to keep CO<sub>2</sub> and fine dust emissions to a minimum. A very low noise emission of only 55dbA at a distance of 1m would further benefit the health of people living close to the conveying route.

While being a cost-efficient solution, RopeCon® also takes care of various aspects of safety. Transporting the goods or material safely to the place of its destination is, of course, one of the main goals. But RopeCon®'s manufacturer Doppelmayr also keep the operator in mind, striving to allow for a safe working environment and to reduce the need for maintenance tasks as a whole. A third aspect which adds benefits to the products



# RopeCon®

## Efficient Solutions for Bulk Material Handling

Wherever bulk material needs to go – across impassable terrain, rivers, highways and buildings – RopeCon® delivers without a hitch!

Long distances, capacities of up to 25,000 tonnes/hour, minimal environmental footprint, quiet operation plus low operating and maintenance costs: These are the features that convinced leading mining businesses.

[doppelmayr-mts.com](http://doppelmayr-mts.com)



 ... your success story.

 Our know-how ...

is the minimum impact the system has on dust or noise emissions.

### FLEXIBILITY IN USE

The Cerattepe underground copper mine of the Turkish Eti Bakır A.S. mining company (a member of Cengiz Holding) is situated in very mountainous terrain approximately 3.5km southwest of Artvin, a city in the Black Sea region in north-eastern Turkey. The mined copper ore is transported to the river with a 4.5km-long ropeway, which covers a difference in elevation of more than 1,500m on its way there.



*Passenger cabins can be fitted to the ropeway.*



*Cargo is transported in material buckets.*

The mouth of the Cerattepe copper mine is at approximately 1,700m above sea level. From there, the ropeway transports the ore into the valley over a distance of 4.5km across steep, wooded terrain. The incline is more than 43° at the steepest point. The ropeway can also be used to transport backfill material from the valley to the mouth of the mine.

The system consists of a continuously moving steel wire rope to which the 51 material buckets are attached by means of a grip. The rope loop is driven by bullwheels in the loading station and tensioned via a return bullwheel in the unloading station in the valley. A mechanism in the stations opens the detachable grip of the material buckets and slows down each bucket. The buckets can thus be stopped for the loading and unloading procedures in the stations but can still travel along the track at full speed. They are re-attached to the rope as they leave the station.

Furthermore, the Cerattepe ropeway allows for the combined transport of material and people. Apart from the material buckets in which the ore is transported, the system will also be equipped with some passenger cabins.

In these cabins, the mineworkers can travel to their workplace comfortably and in safety. A trip in any of the cabins takes approximately 20 minutes. Two different types of guides are installed in the stations: one for the material buckets, and one for the passenger cabins.

Material flow and passenger transport can thus be kept separated.

To prevent soiling of the sensitive

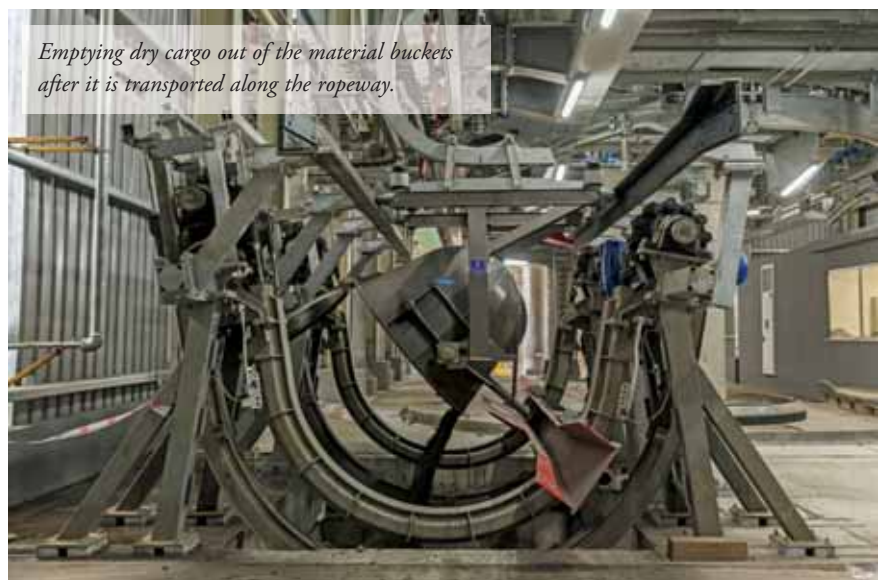
environment, the buckets have been fitted with lids. Any loss of material along the track can thus be prevented. In the unloading station, the lids are opened automatically via a special mechanism and the buckets are turned upside down so that the material will fall onto a chute. Then the buckets are tilted back to their normal position.

Operation of the ropeway is fully automatic. Operating costs can thus be optimized. There are also hardly any moving parts along the track. All material buckets and cabins travel through the stations regularly and can be easily inspected and maintained there.

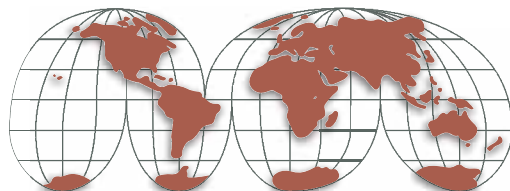
To cover the entire distance and the enormous difference in elevation of 1,500m, the ropeway requires only 11 towers.

The footprint on the ground can thus be minimized, and because the system is elevated off the ground, it does not represent an insurmountable obstacle for man or wildlife.

The ropeway started operations in December 2017 and, since that time, has been transporting 60 tonnes of copper ore per hour into the valley.



*Emptying dry cargo out of the material buckets after it is transported along the ropeway.*



# DOS SANTOS

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**THE GREATER  
THE LOAD  
THE HIGHER  
THE LIFT  
THE BETTER  
WE LOOK**

## **DSI SANDWICH BELT HIGH ANGLE CONVEYOR**

The DSI Sandwich Belt High Angle Conveyor is **PROVEN** in over 100 installations worldwide. It's **RELIABLE** for rugged mining conditions, yet gentle enough for friable materials. It's **ECONOMICAL**, fitting into tight spaces and small footprints. Elevating millions of tons of material at various installations all around the world, users have agreed it's the most reliable, low cost and low maintenance conveyor system available. **LET US PROVE IT TO YOU.**



## Hydraulic direct drives offer superb conveyor productivity

In the continuous operations of the mining and materials handling industry, availability and uptime are of prime importance. This is especially true for conveyors, which are often the only means of transporting materials on site. A brief look at the technical advantages of hydraulic direct drives shows that conveyors can benefit significantly from this drive solution.

Hydraulic direct drives are well adapted to the general conditions in mining and materials handling. Partly due to their enclosed motors, they easily withstand the industry's dust, grit and widely varying temperatures.

For conveyors, however, hydraulic direct drives offer more specific advantages. Easily tailored to both task and load, they have a modular construction that simplifies design and installation. And once in place, they provide many ways to maximize conveyor uptime and minimize stresses on machinery, chains and belts.

### EXCELLENT CONTROLLABILITY

Hydraulic direct drive systems consist primarily of a hydraulic motor and a drive unit, the latter comprising a fixed-speed AC induction motor and an axial piston pump. The drive unit provides a variable flow of oil to the hydraulic motor in response to a control signal, such that the motor's speed can be adjusted for every conceivable need.

The result is that the conveyor can be run at any speed within its speed range — without restriction. This allows soft



starting sequences that minimize belt stress, for example, but also fine positioning when inching the belt in forward or reverse to inspect or replace it.

### UNLIMITED STARTS AND STOPS

In a conveyor, of course, speed capabilities are closely intertwined with torque. Hydraulic direct drives are capable of starting up from rest with a full load, and of accelerating it under the most extreme load scenarios. This is ensured by the very high starting torque, which can also be maintained for an unlimited period of time.

The other side of the equation is hydraulic direct drives' monitoring and

limiting of torque. This function provides built-in overload protection, eliminating the risk of undue stress on conveyor components. The conveyor can be started and stopped as often as required, without affecting the service life of the belt or wearing the machinery in general. This is done easily via the control signal to the pump, without having to stop and restart the electric motor.

### PROCESS OPTIMIZATION

In their unique combination of variable speed control, sustainable torque delivery and protective torque limiting, hydraulic direct drives have yet another benefit. In



## Hydraulic direct drives: benefits for conveyors

- ❖ Variable speed from zero to maximum with no limitations.
- ❖ Smooth, fully controllable acceleration and deceleration.
- ❖ Easy inching for maintenance in both forward and reverse.
- ❖ Availability of full torque throughout the speed range, without the need for electric power oversizing.
- ❖ Starting and stopping of the conveyor as frequently as needed.
- ❖ Longer belt service life due to efficient built-in overload protection.
- ❖ Simple design without gearboxes, v-belts, fluid couplings or foundations.
- ❖ Easy and compact installation, including shaft-mounting of the hydraulic motor without alignment needs.
- ❖ Perfect load sharing when two or more hydraulic motors are used on one pulley or for multi-pulley conveyor design.



short, they enable process optimization beyond any other drive technology. At times when there is a lower load on the conveyor belt, for example, it is possible to slow the belt speed and employ greater torque to maintain a requested material flow. This not only reduces wear on the belt, belt rollers and pulley bearings, but also increases overall efficiency.

### SPACE-SAVING AND LASTING FLEXIBILITY

Perhaps the most remarkable aspect of hydraulic direct drives is the way they achieve these benefits within a very limited space, which is often all that is available on site. Between their compact motors and the small footprint of their flexibly placed drive units, their installation is truly minimal. Moreover, the mounting of the motor directly on the pulley drive shaft means alignment problems are eliminated.

Because the design of hydraulic direct drives is modular, it allows an optimal solution to be sized and tailored for any conveyor, small or large, from a few kilowatts up to megawatts of installed power. Moreover, that solution can be adjusted down the line. With their flexible nature, hydraulic direct drives are easy to upgrade or adapt as needs change and develop over time.

## High Performance Bucket Elevators



### AUMUND Chain and Belt Bucket Elevators

- For the Fertilizer, Minerals and Cement Industry
- Efficient transport of any kind of bulk material



## ROXON returns to the fray under new ownership



*Roxon customer service maintaining overland conveyor in Arctic conditions.*

November 2017 saw the rebirth of the traditional material handling company ROXON. Australian NEPEAN Conveyors purchased ROXON, thus continuing a saga dating back to early 1960s and carrying on with the 'name you know' in the conveyor business, especially in Nordic countries and many other parts of the world.

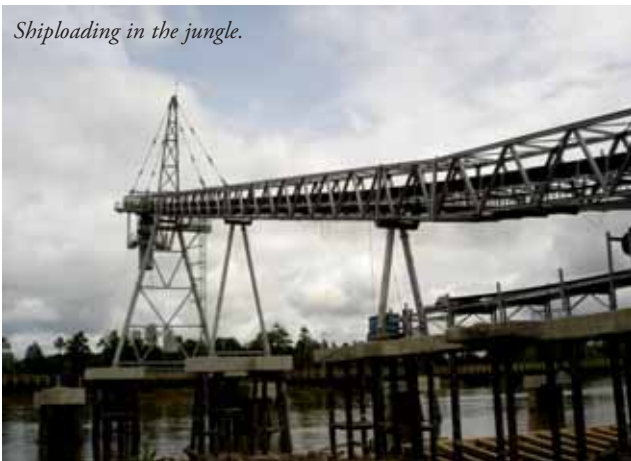
ROXON has a long history, as well as long-term business relationships with many customers. It has expert knowledge about material handling in general and conveyors and their components in particular. The company is constantly supplying equipment

to old and new customers, and regularly comes across ROXON conveyors that are 20 or even 30 years old, and still in operation, at its customers' premises. This proves that its systems are well worth the investment, and that ROXON provides excellent after-sales



*Coal receiving hopper, one of ROXON's standard products.*

*Shiploading in the jungle.*



service throughout the whole life of its material handling systems — from new delivery to modernization and redelivery a few decades later.

NEPEAN introduced its way of working, the NEPEAN DNA, when it purchased ROXON.

In summary, NEPEAN DNA means being extremely customer-focused and passionate about both customers and employees' success. These are not just nice words on the office wall, the whole company believes in delivering a significant difference for its customers over the long term. Employees are all experts in their special fields and can offer the best available projects, spare parts, components and conveyor service for customers.

When customers choose ROXON for their material handling projects, they can be



*HC100 standard conveyor  
ready for delivery.*

confident that the company will be there throughout to support them, as it has been for decades. No project is too small or too big — ROXON's reference list includes material handling projects ranging from a single conveyor to large-scale material handling plants and equipment outputs from a few kW to dozens of MW. ROXON's customers range from sand and gravel plants with relatively small conveyors to harbours with shiploaders to large-scale overland conveyors where a single conveyor might have 10MW motor.

ROXON's website shows examples of the projects that have been delivered. In terms of numbers, most of its projects have

Many ports and terminals do also have ROXON conveyors and shiploaders. The longest ROXON conveyors are several kilometers in length and one single project with most conveyors included 100 pieces of belt conveyors delivered into one single plant building.

Not all material handling equipment needs to be tailor made and take a long time to deliver. Therefore, ROXON has developed a wide range of standard equipment with less or no custom-engineering required, thus reducing the delivery time significantly compared with projected equipment.

The most-sold standard equipment is

been carried out for Nordic mining customers, but the company also has many references in other parts of the world as well — ranging from Persian Gulf sulphur handling to coal crushing and handling in the equatorial jungles.

the HC100 belt conveyor, which has sold over 700 units over the years and delivered around the world. HC100 belt conveyors are suitable for both mining and construction plants and their delivery time is considerably shorter than that of normal conveyors, due to standardization of the parts. Other similarly standardized equipment include, for example, link conveyors, apron feeders, reclaimers, belt feeders, loading hoppers, shiploaders and stackers.

The most important single phase in any project is the engineering. It is during engineering when most of the important decisions, which affect the project outcome and result, are made. ROXON has gained a lot of knowledge during decades of conveyor projects and its engineers are among the best experts in the industry. As an example, ROXON engineers played a key role in engineering of a 27,600tph (tonnes per hour) shiftable conveyor system (length several kilometres) a few years ago.

The company is also able to (DEM) simulate material flow in chutes, which is a very important small detail in any conveyor project.

# ROXON

## New Era in Bulk Material Handling

[roxon.com](http://roxon.com)

*Standard apron feeder.*

ROXON would not be able to call itself a 'conveyor company' if it did not have component expertise as well. Customers can source all conveyor-related vital components — pulleys, rollers, belt cleaners — from ROXON. The component portfolio includes not only these traditional components, but also includes new technologies. Details of its HX270 belt condition monitoring is also available on its website. Customers certainly understand the value of monitoring the multi-million-euro conveyor belts in long belt conveyors and ROXON is happy to supply this system to support customer needs.

Belt conveyors seem not to be 'rocket science' but learning the tricks to get them run aligned and well maintained takes several years. That's why ROXON has highly qualified customer service personnel in Finland and Sweden who can cure any conveyor problem customers have. It does not matter if the problem is small or big, ROXON customer service is happy to come and help out. The experienced 'Roxperts' (ROXON belt conveyor experts) can do anything from belt splicing to roller installation. Safety inspections are also offered to update older material handling systems. ROXON is not aware of there ever being a problem that its customer service team has not been able

to solve.

With life span of several decades, conveyors occasionally need a face lift — or modernization as it is called. This is also something ROXON can do. ROXON has delivered dozens of bigger or smaller projects and the employees involved in these projects are at least as experienced as the customer service personnel. Customers needing bigger capacities for their conveyors, or wanting a belt-twisting device retrofitted should just call ROXON to see how this can be achieved.

Just like its parent company NEPEAN in

Australia, ROXON operates with a flat and efficient organization. This means decisions do not take weeks as in some large organizations, but will be made quickly. This, combined with experienced professionals, provides the competitive edge that ROXON wants to offer its customers when delivering projects. ROXON is happy to help with a conveyor-related problem or deliver a complete new material handling system tailor made for its customers' requirements. The company looks forward to serving both old and new customers.

*Roxon offers components for every kind of conveyor.*



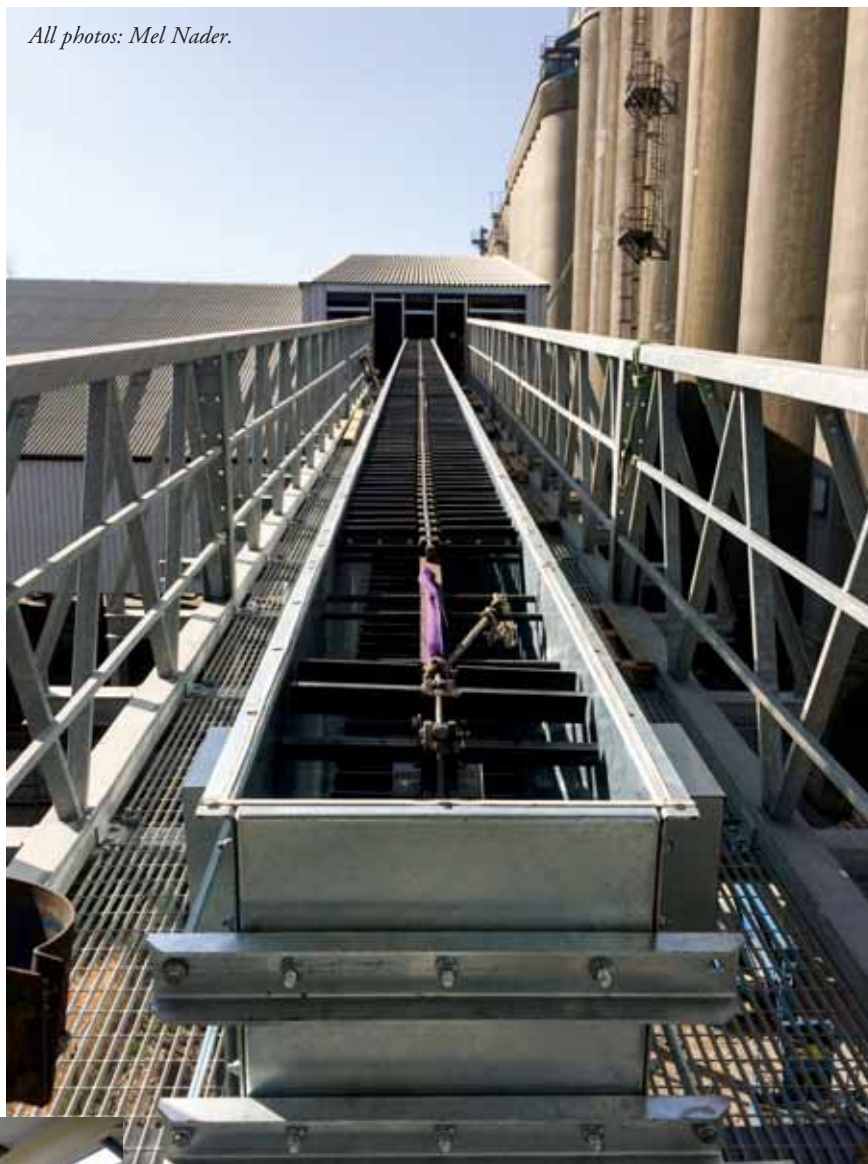
## Guttridge advises on the criteria when selecting a grain conveying system

Selecting the best mechanical conveying solutions for any application is crucial to processing a success, productivity, efficiencies and for the business profits., writes Douglas Anderson (Sales & Marketing Manager at Guttridge). Many types of mechanical conveying systems are available and are used according to the various needs in dry material processing operations. Mechanical conveying systems, for example belt conveyors, (flexible) screw conveyors, vibrating conveyors, bucket conveyors (and elevators), aero-mechanical, spiral conveyors and chain or drag conveyors are often the only method for a company to effectively move its bulk product in a timely and efficient manner, offering the most cost-effective solution to meet the customer's specific technical requirements.

Materials handling equipment for grain generally must survive long periods of not being in full use, but once harvest starts, it must be unfailingly reliable. Rapid repair, spare part availability and ease of maintenance are therefore a critical consideration in a sector with the seasonal operation.

Grain storage systems require conveyors that range in size, from low throughput machines for on-farm use to increasingly high flow rate systems for transport in fully integrated large-scale storage facilities. Centralization is a

*All photos: Mel Nader.*



marked trend as farm equipment reaches the end of its life.

Mechanical handling systems offer the flexibility to transfer most materials cost-effectively at the desired process rate. As every material transfer system has unique characteristics and each customer organization aims to achieve distinct objectives, no standard equipment is suitable for all applications. Expert conveyor manufacturers will typically use the standard 'off-the-shelf' components to design custom or bespoke solutions that integrate seamlessly into the customer's process but may offer standard equipment,

where practical, to reduce the cost of investment.

There are different solutions depending on the operational needs of the customer. Pneumatic and mechanical handling solutions are used to transport materials for grain-related industries. Pneumatic equipment is popular for handling some types of dry cargo due to its soft handling characteristics and high throughput. However, for ship-unloading applications, pneumatic cannot be considered to have soft handling properties and high throughputs and mechanical solutions offer better solutions.

Pneumatic conveying is by far the more hygienic conveying method for dry bulk powders, but there remain applications where mechanical conveying is the better choice: processing facilities with nominal headroom above the equipment; a need for high-speed transfer with minimal energy consumption; and transferring friable materials. The differentiator between the

technologies is that mechanical conveying — including belt conveyors, chain conveyors, screw conveyors, aero-mechanical and bucket elevators — use a mechanical device in direct contact with the transferred material.

When selecting the best mechanical conveying solution for any application, it is important that customers provide the correct information to allow suppliers — such as Guttridge — to provide their customers with the safest, most efficient and reliable solution for their application.

Is the system being integrated into an existing system or is it a new application? Are there size and site limitations that prevent the use of certain machines due to lack of physical space or complicated process routes. Green field sites tend to allow the use of more standard equipment, however, where the system needs to be integrated into existing systems, the ability to customise and design systems that meet site requirements becomes more important.

Product attributes — the type and nature of the product to be transferred is a major determining factor when considering which conveyor to use. Providing information regarding the characteristics of the material — density, size, moisture content, temperature, abrasiveness — all impact on the choice of equipment to be used.

Functional requirements — desired conveying rates, capacities, layout requirements and constraints, will the conveyor need multiple inlets or outlets, need to be elevated or moved through multiple planes — all impact the design decisions. Does the conveyor need to be able to provide variable conveying rates or to be enclosed for dust prevention? How will the material be fed into the conveyor



and is there a weight measurement requirement?

Service life — what is the desired service life or operational time? Some conveyors are designed for light usage or short-term operation, while others are heavy duty machines designed for continuous long-term operation.

Long-term energy requirements — selecting the correct conveyor can reduce energy costs considerably — a belt conveyor uses less energy than a chain conveyor which uses less energy than a screw conveyor.

Operating and maintenance features — can the conveyor handle the required conveying distance, current and future conveying volumes? Can it be installed in your existing operation? Are the installation or operating costs high? Will it operate in a sanitary environment or require explosion-proof equipment? Is there a need for an integral bag/sack dump hopper or a mobile conveyor option? Is

the equipment easily maintained? Are spare parts readily available and does the manufacturer offer warranty coverage?

Material testing — ideally, the supplier will also have a test lab with conveyors of various types to help determine which one can best handle the material and operating conditions and the ability to demonstrate on actual machines how the material conveys and the degree of degradation associated with the different types of the conveyor.

Performance guarantee — does the manufacturer guarantee that the conveying system will successfully transfer the material and perform reliably and cost-effectively over its entire life?

The manufacturer — can the manufacturer demonstrate similar projects, offer several types of conveying solutions and provide evidence of the experience gained in meeting the customers conveying performance needs?

These issues do not change irrespective of the material to be conveyed. Grain and associated applications have discovered the need for additional throughput due to changes in economic and market demands. Selection of standard systems may seem attractive from a procured cost perspective but if these systems cannot meet future requirements or cannot be fully integrated into existing systems, are they really as cost-effective as a bespoke solution? Investing in a suitable grain mechanical handling system should consider the same attributes as for other industries and with changing environmental conditions resulting in changing feed patterns for farmed animals, careful consideration needs to happen at the design stage in order to satisfy the full key business performance indicators.



## BEUMER pipe conveyor: safeguarding the environment by moving fly ash quietly and safely for Belgian customer

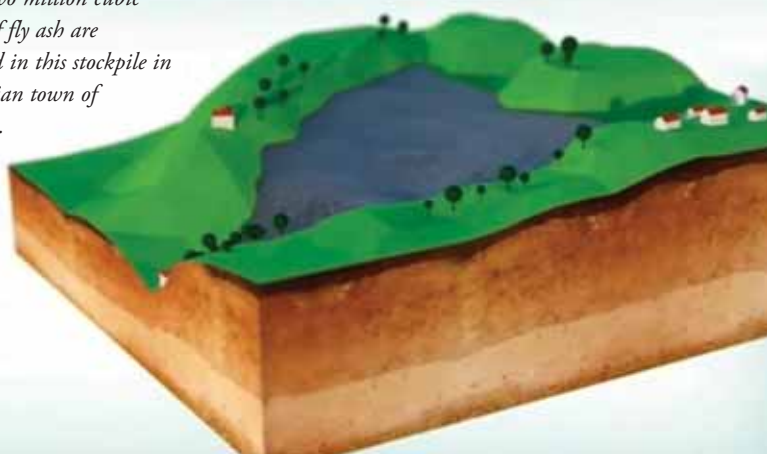
In Wallonia, the southern part of Belgium, a BEUMER Group's pipe conveyor transports fly ash quietly and dust-free, passing through motorways, railways, residential areas and steep rocks — without leaving a trace.

In the past, a coal-fired power plant was once in operation in the Belgian town of Flémalle. The coal residues are landfilled on a fly ash stockpile. Now, the stockpile is to be entirely emptied and the terrain transformed into a nature park. A BEUMER Group pipe conveyor is being used to transport the fly ash to the Maas



*Dizzying heights:  
The technicians  
are mounting the  
suspended elements  
of the conveyor to  
the steel structure.  
Cranes were used  
to exactly  
manoeuvre the  
assembly.*

*About two million cubic  
metres of fly ash are  
deposited in this stockpile in  
the Belgian town of  
Flémalle.*

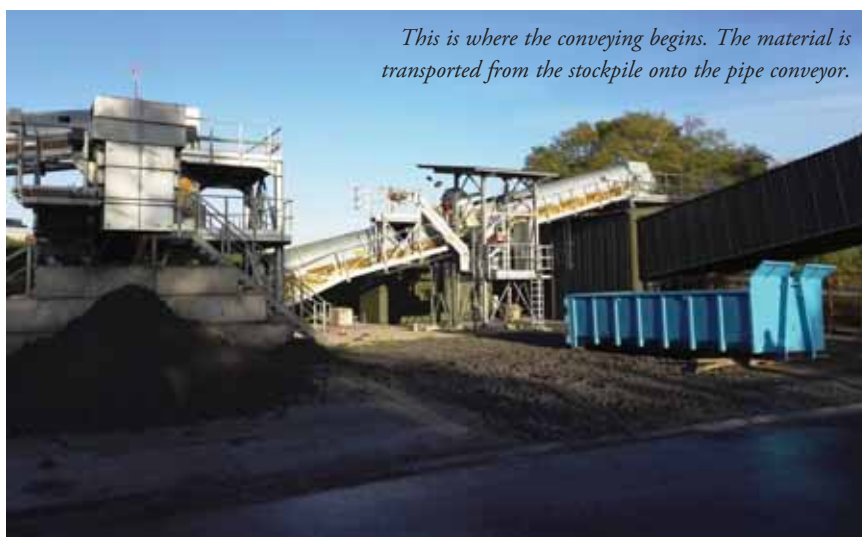


river for shipment. The system has not only been adapted to operate along the steep mountains, but its enclosed design prevents the volatile material from coming into contact with the environment, while enabling a low-noise transport to the destination. This is important as the pipe conveyor passes over public motorways, railways and residential areas. This extraordinary project is characterized by the co-operation of the BEUMER Group team with the customer Tractebel Engineering (Group ENGIE). The transport of the fly ash is carried out in strict compliance with safety standards,

taking into consideration environmental protection and the effect noise pollution has on the local residents.

The neighbourhood around the Belgian town of Liège is calm and picturesque with small villages along the Maas. The forests and landscapes are partly untouched and present a unique fauna and flora. Industrialization started very early in the region of Wallonia, as coal was available in abundance.

Even though the mines were closed years ago, there are still residues of slates and stones or bottom ash. For example in Flémalle, less than 20km away from Liège: for approximately 50 years there are about



*This is where the conveying begins. The material is  
transported from the stockpile onto the pipe conveyor.*

*The line runs across the open environment, over steep rocks.  
The pipe conveyor navigates these inclines and gradients.*



two million cubic metres of the mentioned materials in a fly ash stockpile within proximity of the once largest coal-fired power plant.

The stockpile is indeed surrounded by a wall, but according to a study, in the long run, it will represent a major threat for the local residents as it is displaced every year by several millimetres. In addition, the fly ash is an important additive in the

## Interview with Vincent Lognay, project manager at ENGIE

### **How would you qualify the cooperation with BEUMER Group?**

**Vincent Lognay:** The co-operation was based on trust right from the beginning. We were also convinced by the excellent price-performance ratio. The BEUMER Group team also took care of all other aspects of this project, including the compliance with official regulations and the particularly challenging assembly, sometimes across deep valleys.

### **How did BEUMER Group overcome these challenges?**

**VL:** BEUMER Group deployed three teams. We needed a safe conveying system design, that would prevent any environmental impact and noise pollution during the bulk material transport, so in the first team employees of the local authorities worked in close co-operation with the BEUMER Group experts. The second team was made up of ten BEUMER Group employees that assembled the system, which presented itself as quite a challenge, in this picturesque, yet also quite hilly environment. Special cranes and helicopters were used for the assembly work. The system supplier assigned the third team for this: the Heliswiss International AG from Küssnacht, Switzerland. They provide transport and construction flights with heavy lift helicopters.

### **What were the biggest challenges during the installation?**

**VL:** Extremely precise flight manoeuvres were necessary so that the technicians could safely assemble the elements suspended from the helicopter to the steel structure. In order to bolt the components together, the pilot had to guide them exactly over the bore holes of the connecting piece. The BEUMER Group employees were on platforms attached to cranes in heights of up to 45 metres. Very impressive. The entire jobsite team handled this task perfectly.

### **What was the time frame for this project?**

**VL:** The work began in April 2016, commissioning already took place in October. BEUMER Group supplied everything from one single source. Interfaces could be omitted. Together we were able to comprehensively support the ENGIE Electrabel energy supplier.

### **Does this mean that the collaboration is now terminated?**

**VL:** No, BEUMER Group's extensive customer support ensures a high level of system availability even after commissioning. If necessary, the BEUMER Group service staff will go to Flémalle in order to make the necessary adjustments and prevent malfunctions and machine breakdowns, which would lead to long downtimes.

manufacture of cement and concrete. It must be prepared to remove foreign substances such as wood or metal and to limit the grain size to 70 millimetres for the cement industry. In a project that is the only one of its kind in Europe, the Belgian power supplier Electrabel commissioned its subsidiary Tractebel Engineering (ENGIE) to dimension and install a processing plant. The company offers engineering and consulting solutions for the energy and nuclear energy sector as well as for industry and infrastructure. It is planned to dissipate the complete stockpile in the next ten years, and to transform the terrain into a nature park, which will be developed according to the wishes of the local residents and authorities.

### **PIPE CONVEYOR: THE ECONOMICAL ALTERNATIVE**

Until then, the bulk material has to be transported to the Maas that is approximately 2km away (as the crow flies). However the terrain is very mountainous. The use of trucks would imply driving on public roads for long distances. This would have caused detours, slowed down transport times and raised costs. In

addition, the environment would be harmed by exhaust gases, dust and noise. The project lead opted for the BEUMER Group pipe conveyor as economical alternative.

“To be able to support companies like Tractebel Engineering with turnkey solutions, we have bundled our comprehensive expertise worldwide spanning various industries and established different Centres of Competence,” says Vincent Ferlay, Managing Director BEUMER Group France. “It includes also our pipe

conveyor. This international team of BEUMER Group bundles the know-how and supports the sales department and the project management. With Tractebel ENGIE we have developed a solution adapted to the special routing and the ambient conditions,” explains Ferlay.

### **DUST-FREE CONVEYING**

The system supplier provided a conveying system with a centre distance of 1,800 metres. “Due to the system design and the required system capacity, we have designed



*The assembly work was demanding for BEUMER Group.*



*Special cranes and helicopters were used for the assembly work.*

the pipe conveyor with a diameter of 260mm,” explains Ferlay. The conveyor transports 300 tonnes of fly ash per hour at a speed of 2.3 metres per second.

Most importantly though: the enclosed transport of this machine protects the environment from the dry and dusty material. This was an important requirement for the construction of this solution to be approved in the first place. “The project planning absolutely had to guarantee a safe transportation of the material,” reports Ferlay. “The fly ash had to be prevented from exiting or falling on the ground, even in the smallest quantities”, since the route passes public motorways, railways and residential areas. The noise emission played an important role too. “We had to minimize the noise to an

extremely low level,” he explains. The BEUMER Group team developed special sound-absorbing elements that were also used to enclose the pipe conveyor bridges. “Along certain line sections, the noise level had to be kept under 35 dB(A),” says Ferlay. This is also possible with special sound insulation, idlers and low-noise bearings.

The pipe conveyor transports fly ash across the open environment, navigates large inclines reliably and can be designed to accommodate tight curve radii. This is why only a few transfer towers are required, depending on the length of the conveyor, the terrain conditions and the curves. BEUMER Group can customize the conveying system to match the individual routing, thus protecting the environment and reducing the costs. The system

supports are up to 10m high. Durable conveyor belts guaranteeing tensile strength are used. BEUMER Group makes use of its own dimensioning programmes to determine the ideal belt design, thus enabling to analyse tractive forces but also forces which occur due to acceleration and deceleration — always taking into account the net weight of the belt and the transported material. This method also lets you calculate possible curve radii. “This is particularly important for ascending and descending conveyors,” explains Ferlay. For these types of projects, BEUMER Group also offers feasibility studies and profitability calculations. The colour scheme was selected so that the system blends in well with the environment.

#### EFFICIENT SHIPLOADING

The system supplier provided the turnkey system and all of the necessary components such as filters, strippers and dedusting units. The system provider also provided the engineering, automation and the steel structure, as well as loading systems: excavators load the material into hoppers and on vibrating feeders. From there it is transported to the feeding area of the pipe conveyor. BEUMER Group installed a shiploader at the end of the conveyor line. This consists of a fixed boom with an extendable telescopic belt conveyor. This way the ships are loaded efficiently. The shiploader is also equipped with a dedusting unit which keeps the process emission-free. Every day, 2,000 tonnes of fly ash are loaded on a ship and from there transported to a cement plant.



*BEUMER Group installed a shiploader at the end of the conveyor line. It consists of a fixed boom with an extendable telescopic belt conveyor. Every day, 2,000 tonnes of fly ash are loaded on a ship.*

## Conveying bulk materials with Gambarotta Gschwendt

Gambarotta Gschwendt is world-renowned in the design, construction and installation of equipment for the elevating and transport of solid bulk materials — including conveyors. Its portfolio also includes bucket elevators and high capacity feeders for any type of use, from the concrete and gypsum sectors to those of metallurgy and mining.

Countless plants built around the world tell of a working philosophy that has characterized the company since it was established in 1919, the year of its establishment. This philosophy, updated continuously according to Kaizen techniques\* is expressed by the ability not only to meet any customer need, but often to be ahead of the times with innovative and technologically advanced projects, thanks to the synergies put in place internally, with partners and with major research centres throughout Europe.

Quality and reliability have always been a cornerstone of Gambarotta Gschwendt, attested by numerous certifications including ISO 9001, whose specifications were met by the company even before they were officially set up, as well as EN1090, EN ISO 15609, ISO 9606 and ATEX standard.

This is thanks to the high quality levels achieved by the design departments, the statutory procedures, a continuous exchange between the internal divisions of the company and on-site with customers, the rapid prototyping and the use of the best materials and components available on the market, able to withstand greater levels of wear with a favourable impact on maintenance costs and timing.

Today, this exchange of information translates into extensive and specific know-how that creates highly reliable machines on a daily basis, to meet every need and in full compliance with the strictest international standards.

This reliability fits perfectly with the customer support organization in every operational phase of each site around the world, starting from its design

The high degree of customization

very often requires Gambarotta Gschwendt to create fully customized systems or entirely new products.

The company's Technical Department has, over the years, developed effective organizational methods to reduce the time to market.

For example, Gambarotta Gschwendt believes in the systematic collection and storage of data of each type of machine, and the creation of calculation and sizing systems.

In addition, the company opts for a comparative analysis with real situations and collects information through its customer support system.

Gambarotta Gschwendt reviews the

existing technical literature and creates design specifications, in general and related to individual machines, receiving both the criteria to be applied in the designing itself, and the construction characteristics. It also use pilot plants and carries out tests on a small scale.

The FEM analysis on individual components guarantees the customer performance and reliability.

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

Gambarotta Gschwendt: 100 years of history, 100 years of reliable products



\* Kaizen is an approach to creating continuous improvement based on the idea that small, ongoing positive changes can reap major improvements. Typically, it is based on cooperation and commitment and stands in contrast to approaches that use radical changes or top-down edicts to achieve transformation..

## Sempertrans – innovation in operation

For more than 50 years, Sempertrans has been manufacturing high-quality steel cord and textile conveyor belts which are used to transport dry bulk material, like coal, iron ore, cement, sand and gravel, grain but also chemical products, in the mining, steel, cement industry, ports, as well as for other applications like power and heating plants.

Conveyors are the most effective means of transporting bulk materials. When compared to truck transportation, conveyors bring many advantages. They are not only more cost efficient, faster and safer, they also show higher availability and are more environmentally-friendly. They incur lower operating costs and require less maintenance.

Sempertrans has developed a broad range of conveyor belts (general and engineered solutions) and covers with especially high strength, impact and wear resistance qualities to transport the extracted materials in a reliable and cost-efficient manner. Transtherm is the name of Sempertrans' cover range for high temperatures such as cement handling. It includes a cover grade for extreme high temperatures up to 400°C short term peaks. Transdura is the company's anti-abrasive cover, which is an ideal choice for superior wear and tear as well as cut & gouge resistance. Sempertrans has developed a complete range of specifically adapted covers, which exceed DIN and ISO standards. D50 is its hard rock cover, which is especially designed for the specific requirements of hard rock mining. It is the perfect fit for highly abrasive ores, maximizing the lifetime of the belts. D30 is a newly developed cover with rock bottom



abrasion values, especially designed for the transportation of small sized, but highly abrasive materials like iron ore.

Sempertrans' engineered solutions include the Autostable which has a unique self-centring mechanism without additional equipment on the conveyor. It reduces the risks of off-centring and consequently of deterioration of the moulded edges. The Transpipe belt allows enclosed material transport whilst providing several other advantages over conventional conveyor belt systems. It is an engineered solution for material and environment protection. Transpipe is loaded like a regular conveyor belt and then formed into a pipe shape along the conveying route.

### STAYING COMPETITIVE IN THE MARKET

Sempertrans' customers need customized solutions which ensure long-lasting

operations while reducing operating costs. Sempertrans, sees itself as a partner that helps the customer find optimal conveyor belting solutions for their application. The company wants to create added value, not only by helping make the entire conveyor system as safe, efficient and reliable as possible. The Global Application Engineering Team supports in analysing each specific application and the prerequisites of the conveying operations, and then provides the most adequate technical solution.

Sempertrans places the utmost importance on the quality of its products and services. It engages in all processes of manufacturing a conveyor belt, from creating its own belt design to mixing its own compounds and producing its own steel cords — ensuring total control over the technical construction and properties of its belts.

### FLYINGBELT: AERIAL CONVEYOR SOLUTION SAFEGUARDS THE ENVIRONMENT

One remarkable example of engineering prowess on an overland conveyor system is the Flyingbelt. It started running in July 2016 after a successful collaboration between Sempertrans and Agudio (a brand of Leitner SpA).

For the expansion of its Barroso cement plant in Minas Gerais, Brazil, Lafarge-Holcim was seeking an innovative conveyor solution which would withstand a demanding production capacity without wreaking havoc on the surroundings. The Flyingbelt is an aerial conveyor system suspended on four track ropes. Standing on a ropeway 7.2km long and up to 36m high, this unique installation transports 1,500 tonnes per hour of limestone and





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– Henry Ford

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*The Flyingbelt is suspended on four track ropes, standing on a ropeway 7.2km long and up to 36m high.*

clay from the quarry to Lafarge-Holcim's cement plant, while crossing valleys and a dense vegetation without ever touching the ground. That is the equivalent of more than 40 trucks per hour that would have to travel 24km of road instead. It is the longest Flyingbelt in the world and a more cost-effective, efficient and environmentally-friendly conveying solution compared with conventional truck transportation.

For this unusual structure Sempertrans' Metaltrans belt was the perfect solution. It has a unique steel carcass construction with a low elastic modulus which allows for optimum elongation. This feature ensures that the belt is supple and can stretch out enough to fit the deformation imposed by the very small radius curves on the pylon stations supporting the Flyingbelt.

### NEW TECHNOLOGIES

Sempertrans R&D activities focus on developing innovative compounds, like the energy-saving TransEvo or an environmentally friendly lead-free compound, as well as optimizing belt splicing technologies.

The TransEvo belt significantly reduces the so-called indentation loss at the idler stations which is responsible for up to 60% of the overall running resistance of the belt. This technology can reduce the power consumption needed to run the conveyor system by up to 25%.



### ABOUT SEMPERTRANS

Sempertrans, a business segment of the Semperit Group, is one of the world's most respected suppliers of conveyor belts. Its high performing products are used in several applications — from copper mines in Chile to coal mines in Germany and port facilities in Australia. The product portfolio includes a full range of technologically advanced, textile as well as steel cord conveyor belts but also unique speciality belts (Autostable, Metalcord etc.) to suit the demanding needs of its customers. Not only does Sempertrans support customers in terms of manufacturing, installation and maintenance, it is also represented worldwide by an Application Engineering

team. These conveyor belt experts are dedicated to providing customized consulting services such as the design and configuration of conveyor belts in order to optimize the effectiveness of its customers' business operations.

The increasing demand for Sempertrans conveyor belts has also led to the decision to expand the production capacities at the plant in Belchatow, Poland. In total, more than €40 million will be invested to increase the production capacity there. Today the Belchatow plant is supposed to be Europe's largest conveyor belt production site. Together with the implementation of state-of-the-art production technology, it might be the most modern one, too.

# TMSA

## Ship Loaders

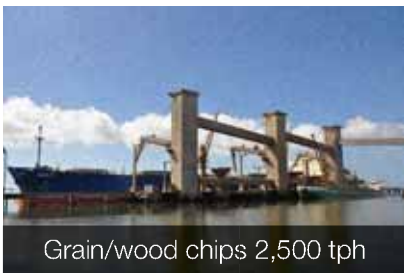
TMSA are specialists in the design and manufacturing of ship loaders for a vast variety of bulk materials, ranging from agricultural to mineral commodities. Our In-House Design Engineers are Experts in Loading Solutions, and will meet every customer unique equipment requirements.



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## TMSA enclosed belt conveyor safeguards the environment

### BRAZILIAN COMPANY'S EXPERTISE CONTRIBUTES TO GREAT ENVIRONMENTAL SOLUTIONS IN URBAN PORT TERMINALS

TMSA – Tecnologia em Movimentação has been in business for 52 years. In that time, with the company's own developments and through globally recognized partnerships, TMSA has offered integrated solutions that comply with international standards and also meet the specific requirements of each client.

TMSA is renowned for the reliability, safety and durability of its projects. They also integrate issues such as cost, environment and social and infrastructure considerations. With its headquarters in Brazil and offices in Latin America and the United States, TMSA's business strategy is focused on product and market innovation and diversification, especially in areas such as port terminals, agribusiness, mining, power plants, fertilizer industry, renewable energies (biomass).

Using all expertise acquired from previous projects, and having a highly qualified technical team, TMSA has nationalized its enclosed belt conveyor technology. These conveyors are designed to transport bulk materials. Their main characteristic is to be completely enclosed, ensuring maximum efficiency in bulk transportation with less environmental impact.

### MAIN CHARACTERISTICS OF ENCLOSED BELT CONVEYORS

- ❖ versatile equipment, adaptable to the needs of the customers;
- ❖ manual take-up stations with screw



*Enclosed belt conveyor for operation within a shiploader boom.*

system; or automatic gravity systems with counterweight (horizontal or vertical take-up);

- ❖ easy-to-disassemble rollers, with no need to move the belt for maintenance;
- ❖ entirely enclosed equipment, without exposed moving parts, fully complying with NR-12 Standard;
- ❖ possibility of adapting firefighting systems upon customer's request; and
- ❖ impact rollers are used to control the load at the feed points, increasing the expected operating life of the belt.

Another important advantage is the ease in operation and maintenance of the equipment.

### ENCLOSED CONVEYOR FOR HORIZONTAL OR INCLINED TRANSPORT

Compared with conventional conveyors

already on the market, enclosed conveyors for horizontal or inclined paths have several advantages, depending on the characteristics where they are installed. A higher load capacity due to the possibility of increasing the belt speed is one advantage — unlike conventional conveyors that convey with a lower speed, due to dust generation in the transfer points between equipment.

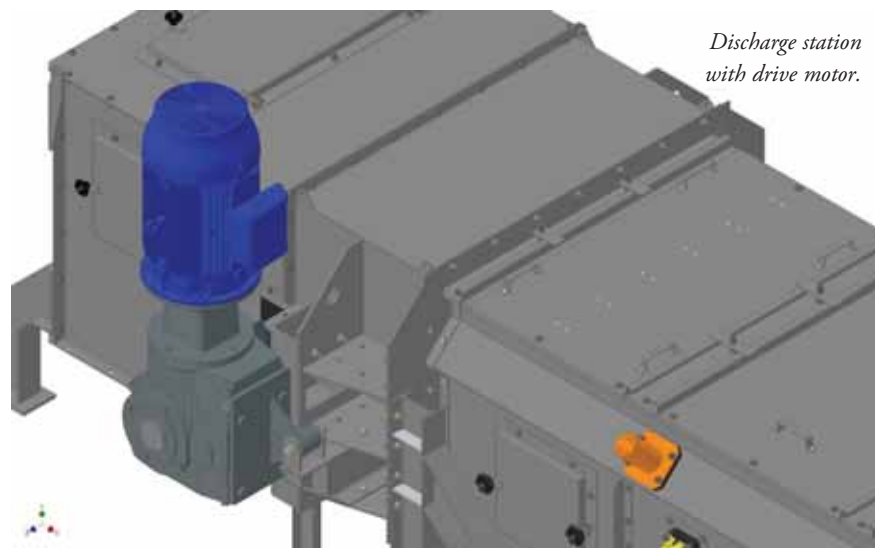
### HIGH CAPACITY ADDED TO LOWER INFRASTRUCTURE COST

Enclosed belt conveyors can be used to meet capacities up to 3,500tph (tonnes per hour). As they are supplied in almost complete modules, they have the advantage of requiring less time and cost for mechanical assembly. Since they do not require external protections, they also provide lower infrastructure costs when installed in tunnels and galleries; they also do not require external covers and can be installed directly under local climatic conditions.

### SAFETY AND RISK REDUCTION

With enclosed belt conveyors, the conveyor belt is completely enclosed, which prevents any possible product spillage to the environment. All dust that is generated by moving the bulk material remains confined within the conveyor enclosure.

To prevent any risk of explosion caused by the dust contained inside the conveyor, the roller bearings are mounted externally to the conveyor enclosure. Operational



*Discharge station with drive motor.*

safety is another differential feature of the enclosed conveyor, since all moving parts are assembled within the conveyor's enclosed body and it is not possible to access them during the belt conveyor operation.

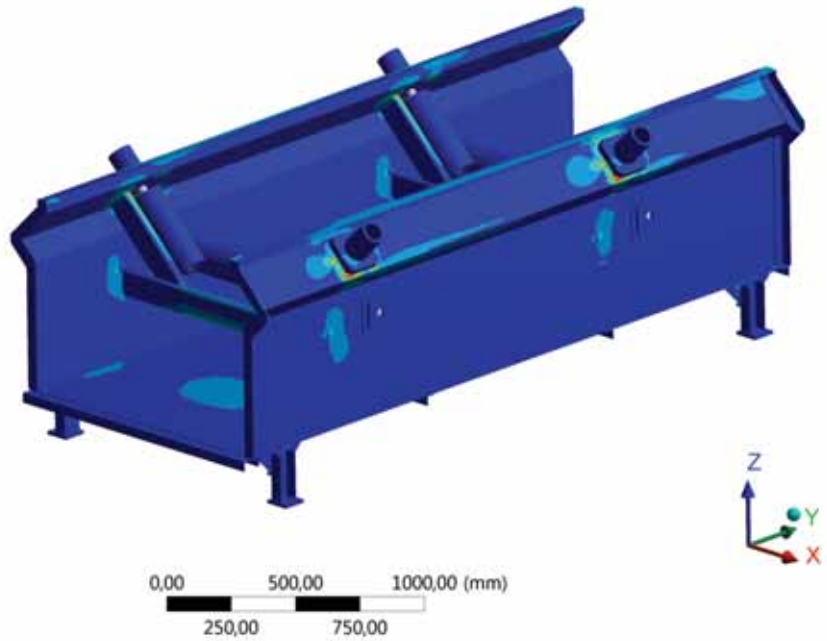
**EASY DISASSEMBLY AND MAINTENANCE**

Regarding maintenance, all components that require periodic inspection are externally mounted with easy access, even when component set replacement is required. If necessary, the inclined rollers (monoblock type), including all components, are easy replaced. The central rollers can also be easily removed by the side of the conveyor structure. The same ease is provided to replace the bottom sliding plates, which can be performed by simply disassembling the bottom of the conveyor structure.

**OVER THE PAST 50 YEARS, TMSA HAS COMPLETED IN EXCESS OF 1,000 PROJECTS.**

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**A: Static Structural**  
Equivalent Stress  
Type: Equivalent (von-Mises) Stress - Top/Bottom  
Unit: MPa



*Finite element analysis of the conveyor structure (the conveyor top cover is not represented here in this analysis).*

loading/unloading systems in port terminals and storage warehouses. Millions of tonnes of product are stored and conveyed with

TMSA equipment, or with equipment provided by one of the company's partners from almost all the continents.

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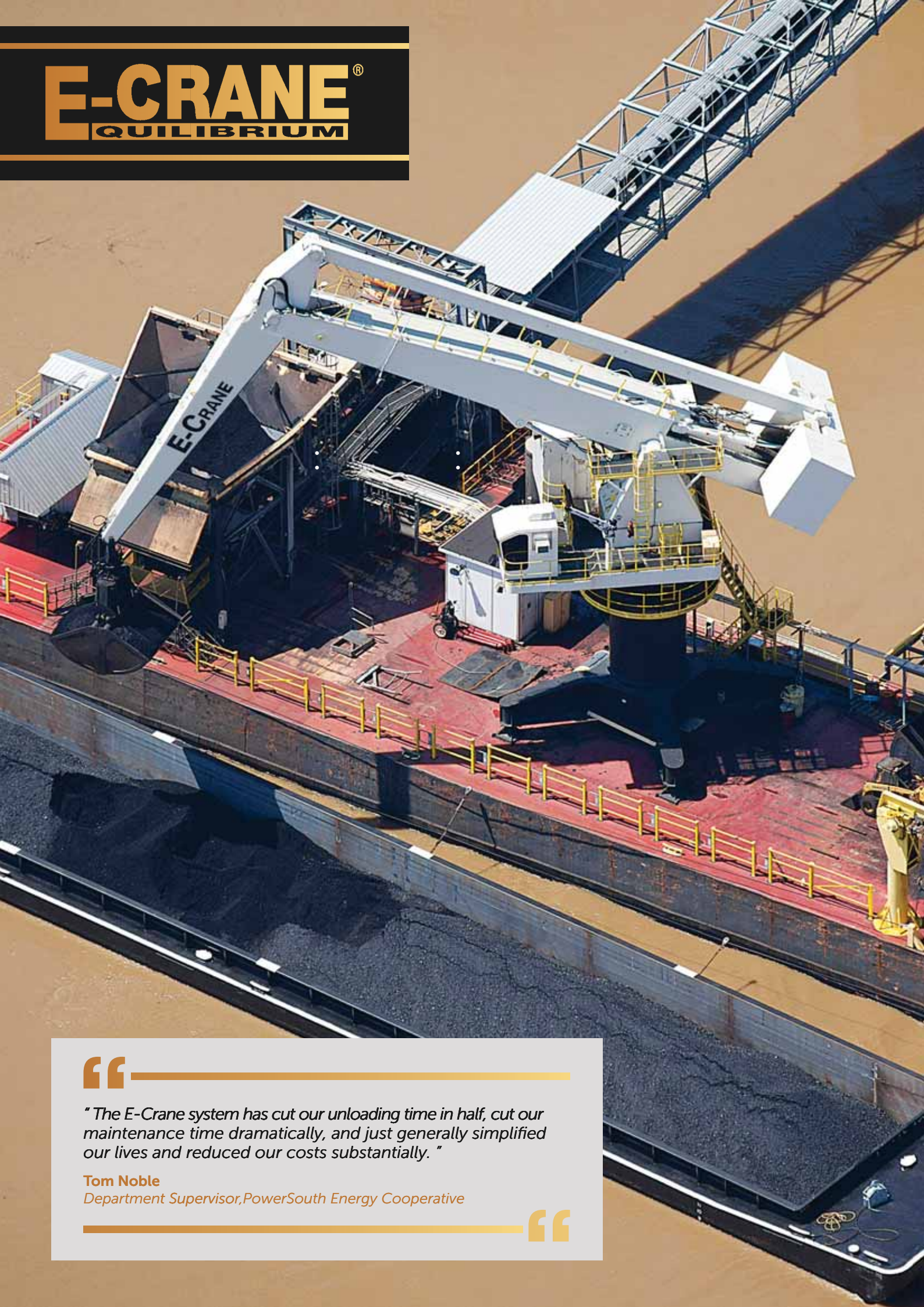
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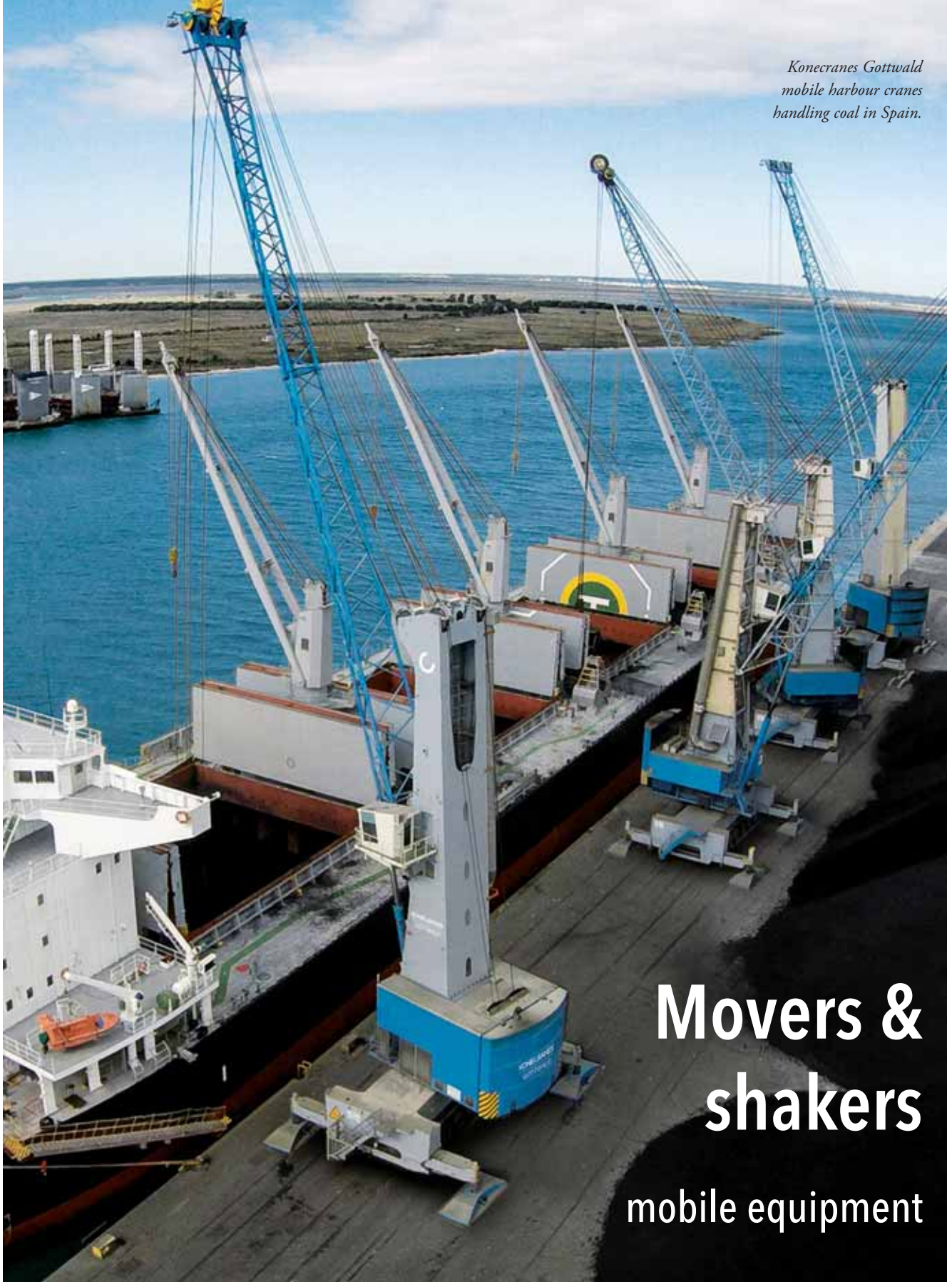
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*“The E-Crane system has cut our unloading time in half, cut our maintenance time dramatically, and just generally simplified our lives and reduced our costs substantially.”*

**Tom Noble**  
Department Supervisor, PowerSouth Energy Cooperative

”

*Konecranes Gottwald  
mobile harbour cranes  
handling coal in Spain.*



## Movers & shakers

### mobile equipment

### Konecranes Gottwald mobile harbour cranes keep bulk cargoes moving

Konecranes is a renowned and respected group, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Regardless of lifting needs, Konecranes is committed to providing its customers with

lifting equipment and services that increase the value and effectiveness of their businesses.

For over 80 years, Konecranes has been dedicated to improving efficiency and performance of businesses in all types of

industries. It has done this by continuously providing lifting equipment and services people can trust.

Among its product offerings, Konecranes manufactures a range of mobile equipment, and has in recent



*Konecranes Gottwald portal harbour crane in Brazil handling fertilizer.*

Konecranes' wide range of mobile harbour cranes includes dedicated four-rope grab cranes for continuous-duty bulk handling (coal, ores, grain, animal feed, fertilizer and alike). This range includes not only rubber-tyred mobile harbour cranes but also floating cranes and portal harbour cranes based on mobile harbour crane technology. All cranes are marketed under the Konecranes Gottwald label.

Depending on site and operational conditions, these cranes can handle bulk cargoes at rates of up to 2,000tph (tonnes per hour).

Konecranes' customers can be found all round the world, and include e.g.

terminals, and so forth.

To stay competitive, Konecranes offers cutting-edge machinery and smart crane features to improve productivity and safety.

Bulk handling mobile harbour cranes on chassis, portal and barge are becoming more and more popular.

- Konecranes mobile harbour cranes:
- ❖ are capable of continuous-duty bulk operation, under particularly tough conditions (24/7);
  - ❖ offer handling rates up to 2,000tph depending on site conditions;
  - ❖ offer high working speeds even when the crane is performing lifting, slewing and luffing motions simultaneously; and
  - ❖ have dust suppression systems for machinery and drives.

Comfortable, ergonomically designed cabs, combined with the Konecranes' Visumatic® crane management system ensure an excellent human-machine interface.

A wide range of Smart Crane features can be included in the Visumatic® crane management systems, providing better productivity and safety in operation. All of these features are suitable for all Konecranes Gottwald mobile harbour cranes.

months received several orders for its bulk handling mobile harbour cranes, with contract details remaining confidential at this stage.

leading bulk handling companies and terminal operators (stevedores, port authorities, major shipping terminals), power stations or industrial plants near

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## Hitachi wheel loader helps drive Swiss recycling plant

TIB Recycla SA (TIB) has selected a new Hitachi ZW310-6 wheel loader to be its main workhorse at the company's new recycling centre in the district of Lugano, Switzerland. The machine was supplied to TIB with a five-year/6,000-hour extended warranty and service contract by the country's official Hitachi dealer Probst Maveg.

The plant — located within the municipality of Mezzovico-Vira — was completed in August 2017. The ZW310-6 is being utilized on site to drive up the steep ramp and feed the machine with freshly delivered materials. Its other main task is to load delivery trucks with finished aggregates for onward transportation by road or rail.

### EXEMPLARY SERVICE

TIB was established in 2014 as a partnership between three companies: Toggenburger, Implenia and Bizzozero. The purpose of TIB's new facilities is to provide the construction industry with the opportunity to dispose of excavated and demolished materials, and acquire the



recycled aggregates for reuse in building and other projects across Switzerland.

The medium wheel loader was delivered in the third quarter of 2017, along with three Hitachi medium excavators — a ZX240-5, ZX135US-6 and ZX300-6. TIB was happy to invest in the new machinery, owing to the reliability of the equipment and the relationship it shares with Probst Maveg. "Hitachi is strong in this region and the most important element for us is the exemplary service," says TIB's Director Roberto Bizzozero.

"We benefit directly from our dealer's top quality approach, and enjoy a friendly business relationship and high level of

professionalism with our main point of contact. The ZW310-6 is working for around 15 hours per day, so it has to be reliable. Apart from preferring the orange Hitachi colour, we highly appreciate the quality associated with the brand and the high resale value."

### AN IMPRESSIVE ACQUISITION

Despite working with another manufacturer over the past 30 years, Bizzozero has enjoyed 15 years of Hitachi ownership even more: "We opted for the ZW wheel loader due to the total cost of ownership, driven by its low fuel consumption, as well as the high price/quality ratio."

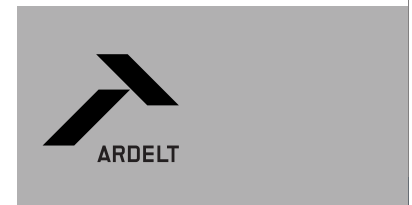
Operator Damiano Alberton has also been impressed with TIB's new acquisition: "The driving position in the ZW310-6 is perfect — the best one I have experienced — and the noise levels in the cab are low. In addition, the visibility is ideal for both feeding the recycling installation and loading trucks with the finished materials. The power and torque of the engine are also excellent for travelling up the steep ramp."

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↪ [alfred.endl@sennebogen.de](mailto:alfred.endl@sennebogen.de)

**SENNEBOGEN**

## New Doosan DL580-5 wheel loader aimed at heavier work



Doosan has launched the new DL580-5 top-of-the-range Stage IV compliant wheel loader. With a bucket capacity of 6.4m<sup>3</sup>, the DL580-5 has a similar look to the existing DL550-5 model, but features robust structural components and an advanced sophisticated double circuit axle cooling system to provide an ideal solution for applications such as block lifting and other heavier material-handling needs in industrial, construction, recycling, mining and quarrying applications.

To meet these requirements, the DL580-5 has an operating weight of 36,030kg and higher static tipping loads (straight/full turn 40°) of 29,700 and 26,200kg, respectively. The overall size of the DL580-5 is almost the same as the DL550-5, but the new model is equipped with a series of features that make the machine extremely reliable and durable.

For example, the front structure is more rugged, with greater rigidity and strength. The DL580-5 has reinforced Z-bar kinematics for heavier lifting with few moving parts. This design also helps stabilize the loader, enables rapid bucket movements and keeps the bucket at the right angle position at all times. As with all Doosan DL-5 models, the DL580-5 is also available with a high-lift configuration, with a longer arm enabling higher dumping of materials.

The DL580-5 incorporates all of the new safety and ergonomic features recently announced for the other six large Doosan wheel loaders from the DL280-5 to the DL550-5. It also features the new restyling common to all models in the Doosan wheel loader range. The new styling scheme involves a change of colour (from orange to dark grey) for the front lift arm, front frame and front and rear axle components on the machines. The more dynamic curved lines of the new styling are designed to reinforce the robustness and power of the Doosan wheel loader range.

The DL580-5 is powered by the Scania DC13 6-cylinder engine producing 283kW (380HP) of power at 1,800rpm. Providing a generous maximum torque of 1,765Nm at 1,300rpm, up to a 10% cut in fuel consumption and excellent response, the Scania DC13 engine meets Stage IV emission regulations without the need of a diesel particulate filter, by using cooled exhaust gas recirculation and selective catalyst reduction after-treatment technologies.

### ADDITIONAL FUEL SAVINGS

The engine auto idle system when activated saves further on fuel costs by lowering the idle level from 950 to 750rpm — when the operator does not give any input to the steering wheel, arm and bucket for more than ten seconds (ideal for applications

where there is a lot of waiting time such as truck loading which can be up to 8% of the time). In all DL-5 loaders, the engine auto shut off shuts down the machine after it has been idling for a specified amount of time (3–60 minutes, configurable by the operator via the control panel). This feature saves on fuel and reduces operating costs.

The DL580-5 also features automatic five-speed powershift transmission, heavy duty cooled axles, a high comfort cab, smooth and responsive hydraulics and auxiliary hydraulic connections, together providing a solution for the heaviest jobs that need to be done. As with all other Doosan DL-5 wheel loaders, most of these features are standard on the DL580-5 unlike other machines on the market where they are options and many have been developed to optimize fuel efficiency.

### ZF FIVE-GEAR TRANSMISSION

The ZF five-gear transmission transfers the power from the engine to the wheels and contributes significantly to the overall reduction in fuel consumption. Engine speed variation is less thanks to smaller gear steps, and lower engine speed throughout the whole drive range reduces fuel consumption. Thanks to higher shift quality, noise levels are lower while driving performance and productivity have been

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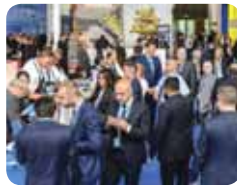
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Like all Doosan wheel loaders, the DL580-5 is equipped with a torque-converter-lock-up system which, when activated, is switched on automatically. The lock-up provides a direct drive between the engine and transmission, enabling 100% torque delivery without any loss from second gear up to the top fifth gear. This makes the lock-up more efficient, giving faster acceleration on flat ground (10%) and higher climbing ability (up to 20%), together with around up to 15% fuel savings in daily operation. This contrasts with many of the drive systems on other machines, where the lock-up is engaged only in highest gear.

#### LOAD-SENSING HYDRAULIC SYSTEM

Like all latest-generation Doosan large wheel loaders, the DL580-5 has a load sensing hydraulic system, whereby the variable axial piston pump generates the flow upon demand in the amount necessary to perform the work. This also gives better traction for penetrating into the stockpile, as less force is necessary to operate the bucket in many situations. Load sensing hydraulics also minimize loss in the hydraulic circuit during a carrying operation in which the loader is usually

running, which is an essential technology for wheel loaders. In response to customer feedback, the load-sensing system has been designed so that the bucket has higher priority when the boom and the bucket operate at the same time and there is limited force available.

Joystick control on the new wheel loader is designed to easily combine several movements at the same time. As an option, three-lever fingertip control can be provided for smooth and near-effortless control. Both of these controls use electrohydraulic piloting.

The DL580-5 has a boom kick-out function as standard, which is useful when working in confined spaces or when repeating similar operations in specific work ranges (for example, when a certain dump height must be reached every day). The same system is used to set the bucket automatically to the 'return-to-dig' position.

The LIS (Load Isolation System), often called 'Ride Control', provides the operator with a smoother ride over rough terrain and enables a more comfortable ride at higher speeds. The benefits are reduced cycle times, higher productivity and better fuel efficiency while performing load and carry applications. LIS also contributes to

longer frame and machine life.

The loader also offers a 'third function' to power a hydraulic system on a work tool, allowing greater machine versatility in a number of applications. The third function valve's capacity has been increased significantly to at least 250 l/min discharge.

#### HIGH COMFORT CAB

The cab demonstrates how Doosan has placed operator comfort at the very centre of its design priorities. Offering generous headroom and an ultra-comfortable, fully adjustable, heated Grammer air suspension seat, the DL580-5 cab features a novel steering column design giving more clearance for the operator's legs and knees. The steering wheel can also be tilted and moved telescopically to match the operator's preferred position. Electric joystick steering is incorporated to ensure operator driving comfort and improve productivity.

Many of the new features on the cab in the large DL-5 wheel loaders such as DL580-5, are aimed at increased safety and visibility in and around the operator's cab. For example, a new handrail has been installed around the cab roof with three holding points, allowing operators to move very safely all around the cab to clean

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windows and to perform other tasks.

A new large step and access platform has also been added on the front of the cab and a change in the wiring routing has allowed the horn to be repositioned below the road light. Together these changes ensure maximum safety and confidence, with very safe and faster movements around the cab (without any obstacles) during daily maintenance.

### NEW JOYSTICK CONTROL

Inside the cab, there is a new ergonomic joystick control with a progressive thumb wheel added for the auxiliary hydraulic line (3rd valve). The progressive thumb wheel ensures that no additional lever is needed, providing the easiest combination of movements to manage the third valve operations. FNR control has been relocated on the back of the joystick, via a three-position rocker switch, which is much more convenient and intuitive to use.

The increased space, better visibility and plentiful storage space in the cab allows operators to work for hours without fatigue or discomfort. Meeting ROPS/FOPS regulations, the cab also offers a wide emergency exit (located on the right hand side) to provide fast and easy evacuation in critical situations.

The 5.7 inch full colour LCD panel is suitable for day and night work. The user-friendly monitor has two customizable screen displays to suit the operator's preference, giving a full readout of machine settings and maintenance data.

The rear-view camera greatly enhances visibility and safety. The screen in the cab shows the operator what the camera sees and includes several lines to help judge distances; it also has other functions, including light intensity control, viewing angle control, language setting and power on/off setting.

On the control panel, all the switches are clearly arranged and within easy reach of the operator. Rocker type switches have been replaced by a multi-selection touch pad. Accurate and smooth joystick controls provide further comfort and operators can save time and reduce the number of operations with the 'boom kick-out' and 'return-to-dig' systems. These functions are operated electronically from inside the cab.

The cab air is filtered twice to eliminate all particles larger than 2 microns in size and the fully automatic climate control system adjusts the air temperature and fan speed to maintain the ideal climate setting for the operator.

The operator has the benefit of additional convex mirrors installed on the

SPECIFICATIONS FOR DOOSAN DL580-5 WHEEL LOADER	
Capacity, heaped	6.4m <sup>3</sup>
Static tipping load, straight	29,700 kg
Static tipping load, at 40°	26,200 kg
Length with bucket	9,725 mm
Width with bucket	3,400 mm
Height	3,785 mm
Bucket hinge height	4,780 mm
Dump height (at 45°) with bolt-on teeth	3,380 mm
Dump reach (at 45°) with bolt-on teeth	1,435 mm
Wheel base	3,700 mm
Turning radius, bucket edge	7,544 mm
Maximum travel speed (5th gear)	37kph
Engine	6-cylinder Scania DC13, delivering 283kW at 1,800rpm
Operating weight	36,030kg
Breakout force	225kN
Tyre size	29.5 R25 – L5

lateral mirror frames. The wider angle and additional visibility provided by the convex mirrors along the side of the machine ensure safer manoeuvring of the wheel loader on site and in the quarry.

A new external, steel tool box installed below the ladder on the left hand side of the wheel loader is a convenient location for gathering and storing tools. The tools are now accessible from ground level, with no need to climb up the side of the cab to reach them, so the cab stays cleaner and there is no obstruction of the cab entrance for safer access.

### DOOSANCONNECT FLEET MANAGEMENT SYSTEM AS STANDARD

The DL580-5 is factory-installed with the latest DoosanConnect state-of-art wireless fleet monitoring system, a feature now incorporated as standard in all new DL-5 generation machines. The DoosanConnect system is a tool designed specifically for the Doosan range, providing comprehensive information about machine performance in a dual mode (satellite, Mobile network).

The DoosanConnect system offers a web-based fleet and asset management solution which is very useful for managing the performance and security of machines and promoting preventative maintenance. The system can support multiple Doosan machines in different locations, helping customers to monitor machine utilization rates to assess that the right mix of machines is being used; it can also guide drivers to help them to operate equipment with higher efficiency and to locate replacement machines in the event of maintenance work or breakdowns, all under the umbrella of vigorous anti-theft

and theft recovery protection systems.

### EASY MAINTENANCE AND SERVICING

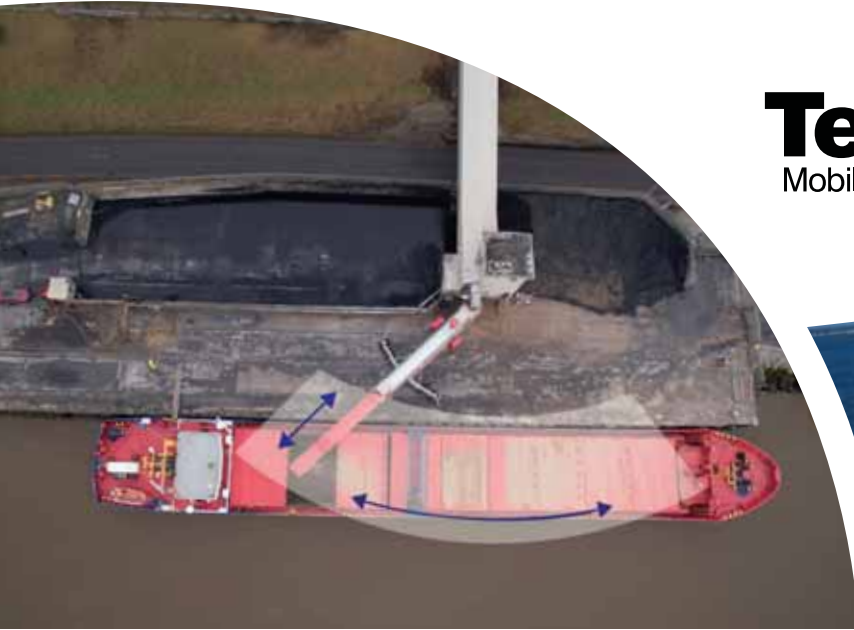
The exhaust and after-treatment system for the engine is installed on the left-hand side of the machine, whilst the components for maintenance are grouped on the right-hand side. All the daily checking of gauges can take place from ground level to ensure it is a quick and safe process. Doosan has also installed an automatic greasing system as standard to reduce working time and increase operating comfort. To facilitate access and mobility, multiple hand-rails ensure that the operator always has a firm support to hold on to.

The wheel loader features a new lockable steel cap on the transmission oil filler, the shape of which has been changed to allow it to be locked with a padlock. When the transmission oil filler tube is locked, the transmission oil cannot be polluted with other types of oil or liquid, dust and other substances. It is also an additional guarantee of security for the customer.

The efficient all aluminium cooling system is separated from the engine compartment to prevent warm and dusty air from entering and to allow better control of the air intake. An automatically variable-speed reversing fan is a standard feature providing the best possible cooling while optimizing fuel consumption. The radiator fan is hydraulically driven and controlled by an ECU. Changing the fan direction for cleaning the radiator can be done manually from the cab, without having to switch off the engine. Fan reverse intervals (30 minutes to two hours) can be set via the menu.



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**#MovingToMobile**

# Hitachi tackles toughest working conditions with the new ZW330-6 wheel loader

The new Hitachi wheel loader features highly durable components and performance-enhancing technology to boost productivity, and several design improvements that result in industry-leading safety for demanding job sites.

Following extensive research in Europe, the Hitachi development team has designed the new ZW-6 wheel loader range to answer the needs of challenging working environments.

Demands for reliable performance without compromising on fuel efficiency, increased productivity, and concerns

SPECIFICATIONS	
Engine rated power (kW):	232 (311hp)
Operating weight (kg):	26,040–26,580
Bucket capacity (m <sup>3</sup> ) ISO heaped:	4.1–5.2
Breakout force (kN):	179–211

for issues such as safety and comfort, have all been carefully considered with the new ZW330-6.

Ideal for quarrying and for port applications, the ZW330-6 is powered by a

new Stage IV-compliant engine for increased productivity and efficiency. It incorporates high-quality and robust components, and the cab offers the best all-round visibility in its class.



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**INCREASED PRODUCTIVITY**

The traction force of the ZW330-6 has been improved by 26% for a more efficient loading operation than the previous model. The wheel loader also has a quick power switch that increases engine output when more power is instantly required, or when driving uphill.

The lift arm contributes to the reliable performance of the ZW330-6. It raises quicker than the ZW-5 model, stops smoothly thanks to the flow control system, and is easy to control using the auto leveller. Simultaneous movement of the lift arm and bucket ensures a smooth digging operation. The bucket is prioritized after unloading so that the wheel loader quickly returns to digging, helping to increase productivity.

**ENGINEERED FOR EFFICIENCY**

The lock-up transmission of the ZW330-6 reduces fuel consumption during travelling, which reduces running costs. It prevents energy loss in the torque converter by coupling the engine with the transmission, even during gear changes.

Another example of the technology incorporated in the ZW330-6 is the engine's after-treatment device. Designed to reduce emissions, it consists of a diesel oxidation

catalyst, urea mixing pipe, selective catalyst reduction (SCR) system and silencer. The SCR system injects urea into the exhaust gas to reduce nitrogen oxide.

**BUILT FOR DURABILITY**

To withstand working in tough environments, the ZW330-6 has been designed with a new rear grille that prevents material from the job site entering the radiator compartment. It is also equipped with high-quality radiators that offer improved resistance to corrosion.

A further example of its robustness is that the lift arm, and front and rear frame have been designed to handle the rigours of heavy applications. An optional belly guard provides added protection for the machine in challenging working conditions.

**SUPERIOR COMFORT AND SAFETY**

The cab of the ZW330-6 makes work more comfortable for operators, with excellent all-round visibility, improved sound insulation, and adjustable features that can be controlled from the multifunctional monitor.

The rear-view camera, curved engine hood, and repositioned exhaust pipe and air intake, all help to provide a better view of the operator's surroundings. LED rear

road lights increase the machine's visibility on dusty job sites.

The ride control feature ensures a smooth drive on all kinds of terrain by minimizing machine pitching. In addition, Hitachi's industry-leading joystick steering system (optional) provides effortless control.

**EASY TO MAINTAIN**

To make maintenance and daily checks quick and convenient, the engine covers of the ZW330-6 open fully to provide easy access. The urea tank can be easily inspected from ground level. The battery disconnect switch — now included as standard — helps to avoid electrical accidents and retains battery energy during long-term storage.

With reliable features, durable components and advanced technology, the ZW330-6 demonstrates the high standards of quality in Hitachi construction machinery. Hitachi Construction Machinery (Europe) NV Wheel Loader Product Manager Vasilis Drougkas says: "The ZW-6 wheel loader is exceptionally durable and reliable to meet the needs of our customers, enabling them to demand more from their equipment, without compromise."

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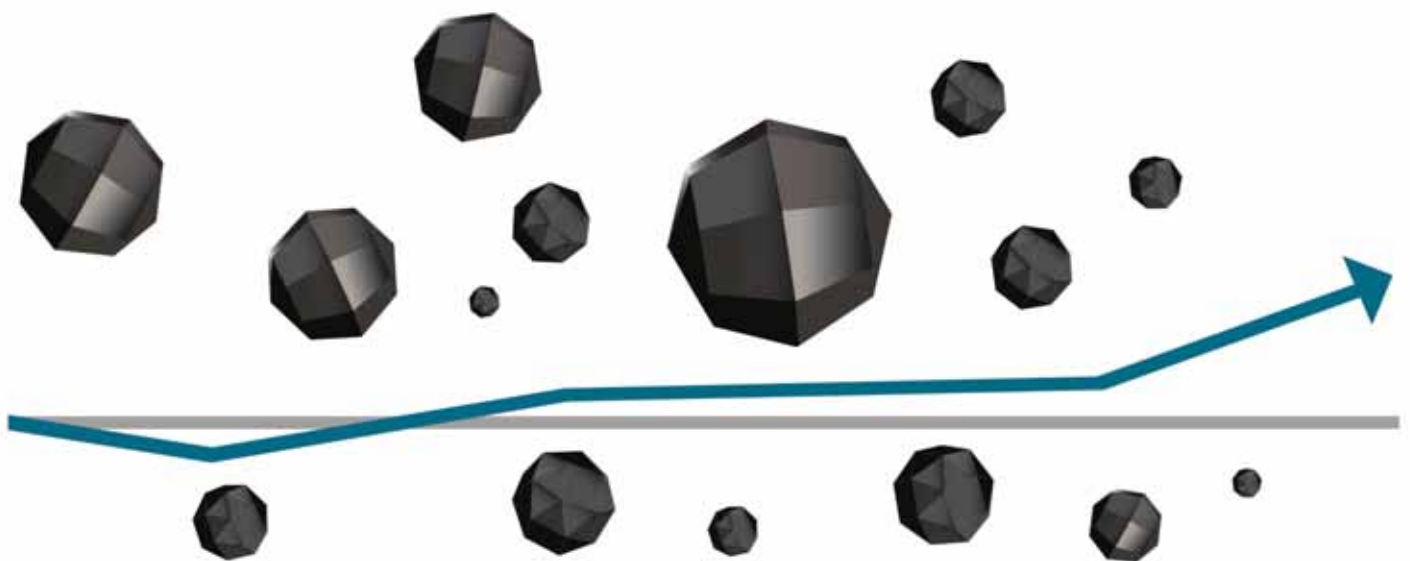
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## New mobile harbour crane starts operating at Weserport in Bremen

Weserport in Germany has been deploying a new mobile harbour crane manufactured by Konecranes to handle breakbulk cargo and project loads at its Terminal I since the end of June. It replaces the gantry slewing crane, which was previously used and has now been dismantled. The Konecranes Gottwald model 6 mobile harbour crane is not only impressive because of its new drive concept, but also due to its high load-bearing capacity.

The load-bearing capacity of the Konecranes Gottwald crane (125 tonnes) is more than twice as much as the previous gantry slewing crane. "As a result, we can now handle individual heavy-duty items with our own equipment," says Heiner Delicat, Managing Director of Weserport.

The new mobile harbour crane is not the first Konecranes Gottwald unit that is in use at Weserport. A crane from the manufacturer's first generation has already been in service for handling purposes at Terminal 4 for a long time. "Its robust design and reliability, but also the price/performance ratio and the rapid availability of the newly acquired crane were persuasive arguments for us. The mobile harbour crane is also eco-efficient, as it has a new drive system," says Heiner Delicat, providing the reasons for the company's choice.

This system combines a short-term energy accumulator with diesel engines and therefore not only meets the latest emissions guidelines, but all the future stipulations in the emissions standard for mobile working machines (EU stage V) too.

The new drive system also makes it possible to reduce fuel consumption.

The mobile harbour crane is mainly handling steel and breakbulk cargo at Weserport at the moment. The crane is also due to be used to handle heavy goods and containers in future. By using a motorized grab at the terminal, it is also possible to move bulk commodities. Overall, Weserport has ten handling devices at all four terminals, including eight harbour cranes and two material handlers.

*The new mobile harbour crane boasts a high load-bearing capacity. (photo: Weserport GmbH).*



### ABOUT WESERPORT

Weserport GmbH is a joint venture involving both the Rhenus Group and ArcelorMittal Bremen GmbH. The neutral seaport service company handled 8.3 million tonnes of maritime goods at its four terminals in 2017.

The Rhenus Group is a logistics specialist with global operations and generates annual turnover of €4.8 billion. Rhenus employs 29,000 people at 610 business sites.

# Standard Industrie mobile cleaner

Standard Industrie is a major provider of equipment for the bulk handling industry. Its product range includes solutions for: blockage and build-up removal;

industrial vacuum cleaning; conveyor belt optimization; silo and hopper cleaning services; and maintenance.

This article focuses on the company's



*Cleaning of the dust released by the machines during the manufacturing process (mill, mixer...)*



industrial vacuum cleaning expertise, specifically its PAD cleaner. To meet its clients' industrial cleaning, pumping and vacuuming requirements, Standard Industrie offers a complete range of equipment and vehicles that combine safety and performance.

From vacuum vehicles to mobile vacuum units, Standard Industrie has a solution for every industrial vacuuming problem.

Recently, Standard Industrie supplied its PAD industrial vacuum unit on wheels, which provides mobility and flexibility to its customers' production lines.

Standard Industrie has recently been contracted by a customer in Belgium, which manufactures wood pellets and small logs — 100% pine — for individual heating.

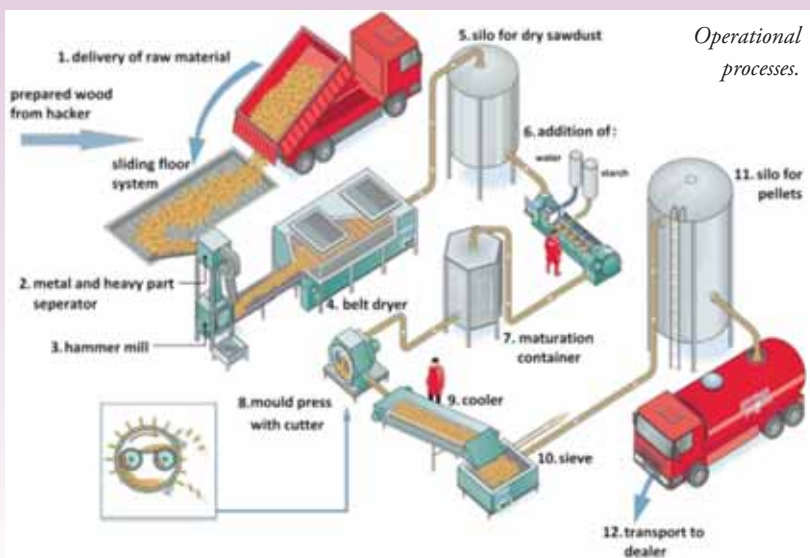
A need for a dust-control solution was identified — without proper dust control, the company operations could pose an ATEX risk. The solution was the installation for a Standard Industrie PAD industrial vacuum cleaner, which is mobile and therefore flexible.

The PAD is used to clean the ground and the areas around the machines, and offers the following advantages:

- ❖ quicker and easier cleaning
- ❖ compare to compressed air or broom cleaning, there is no more dust in the air
- ❖ better working conditions for the operators (less risks of falls, dust breathing...)
- ❖ reduction of the dust layer: no ATEX area.



*Pellet conveyor is not sealed, there is material loss that can be reprocessed*



## The world's harbours are going mobile – and TTS knows how to make it happen

TTS has been tasked by a Belgian partner to build two mobile stackers and a mobile hopper for lime handling.

TTS chose to accept this challenge as it has great knowledge and experience in the design and manufacturing of mobile conveying machines. TTS also knows how to handle lime as, among the others, the company has developed a full equipment set for the lime terminal in Latvia.

Keeping the environment safe has always been a top priority for TTS and this time-specific attention was paid to the complete dusting of the transportation process. Company engineers enabled full enclosure of conveyors, preventing dust from getting into the air, as well as keeping material safe from precipitation and of course adding aspiration units and sealing for chutes.

Having mobile and versatile equipment is becoming ever more important for cargo operators who prefer to stay flexible and adaptable to changing situations in terms of cargo flow. Mobile equipment offers a range of important advantages:

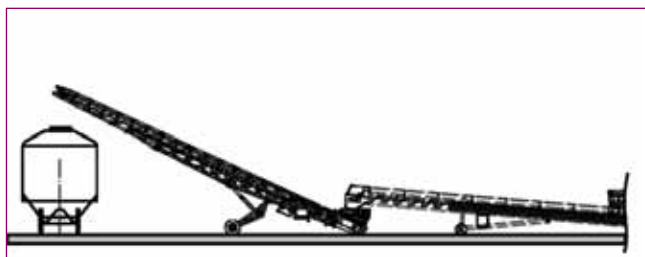
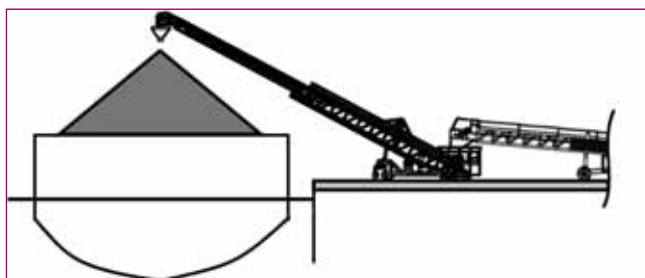
- ❖ quick commissioning,
- ❖ no need to get building permits to install equipment;
- ❖ no need for large investments to build foundations or undertake construction work; and
- ❖ if there's no longer need for the equipment, it can be easily resold.

TTS is following current trends, and offers a range of mobile bulk cargo handling equipment to the marketplace, including:

- ❖ mobile stacker/loaders, fed by front-end bucket loaders;
- ❖ mobile stacker/loaders, fed directly from trucks;
- ❖ mobile stacker/loaders, fed by chains of link conveyors; and
- ❖ mobile unloader of railway transport, with subsequent stacking or loading.

Options include:

- ❖ performance levels;
- ❖ boom and link conveyors length;
- ❖ conveyor belt width;
- ❖ height of cargo feed;
- ❖ towable or self-propelled;
- ❖ magnetic separation;
- ❖ receiving chutes;
- ❖ dust absorbing systems;
- and so forth.



These can be adjusted according to customer requirements and cargo specifications. These are examples of the most common machine options, but the major advantage of TTS lies in its ability to offer customers tailor-made solutions that will fully meet their requirements.



*Model of a TTS mobile stacker.*

## Liebherr mobile harbour crane type LHM 280 for Australia's Joyce Krane

The family business Joyce Krane from Karratha, Australia, recently ordered an LHM 280 mobile harbour crane. The well-known heavy lift and logistic company has been a Liebherr customer of mobile cranes for many years and is now opting for its first Liebherr maritime crane.

Joyce Krane, an Australian heavy-lift and logistics specialist with more than 40 years of experience, is a long-standing Liebherr customer for mobile cranes. Joyce Krane ordered the LHM 280 mobile harbour crane for quayside operation in Dampier, Western Australia.

The LHM 280 will come in the 64-tonne version, and will be capable of handling offshore support equipment, but it will also be equipped to handle standard 20ft and 40ft containers using a RAM spreader. The pad arrangement is designed specifically for the quay, and it has a number of options selected to meet the

requirements of the offshore supply base, such as external weight display and operator sign-in.

### LiDAT® SMARTAPP — MAINTENANCE

Joyce Krane decided to have the new LiDAT smartApp installed on its new machine.

The Liebherr smartApp is an IT solution which supports port terminals in analysing and optimizing cargo handling processes, performed by Liebherr mobile harbour cranes. With LiDAT smartApp, it's possible to analyse your crane data and get answers from it almost immediately.

The Australian company opted for the smartApp maintenance package which shows detailed information about machine operation hours, filling levels and temperatures.

The extended machine reports allow the maintenance manager to precisely plan

times for maintenance and refuelling. This avoids unnecessary downtimes and saves money. It also ensures good service support for a fairly remote location.

### RELIABLE CO-OPERATION AHEAD

"We are more than happy with our Liebherr mobiles and have been dealing with the Liebherr Ehingen factory for years," comments Sean Joyce, Operations Manager at Joyce Krane. "Dealing with Rostock wasn't so different, just the equipment changed. We're really looking forward to getting to use it."

"I visited the Rostock factory mid of 2017," added his brother James Joyce, General Manager of Joyce Krane. "It's a modern facility, and with its own quayside, it makes the despatch of the cranes so much easier."

The crane will arrive in Dampier beginning of 2019.

*The new LHM 280 will be mainly used for the handling of offshore support equipment but also containers.*



# Dusting down

keeping fugitive dust under control

*Spray nozzles penetrate the material stream and coat particles as they fall onto the belt.*



Jay Venter

## Suppressing dust emissions during material conveying and transfer

When fugitive dust emission rules change for mining and processing operations in the United States, regulators around the world take notice, write Brian Nance, *Product Engineer* and Gary Swearingen, *Product Manager*, both from the *Dust Solutions division at Martin Engineering*. Recent revisions such as the particulate emission limits and monitoring rules issued by the Mine Safety and Health Administration (MSHA) Final Rule<sup>[1]</sup> in 2014 or the respirable crystalline silica (RCS) limits stated by the Occupational Safety and Health Administration (OSHA) in 2016 could have a profound impact on global operators in years to come.

Although it takes time, compliance requirements are eventually adopted — and in some cases bolstered — by new workplace safety and operation rules of

even the smallest governments. Both mines and processing operations that previously used vague or lax regulatory standards may be forced to install new systems or retrofit existing equipment with modern dust suppression technology.

### SAFETY AND AIR QUALITY

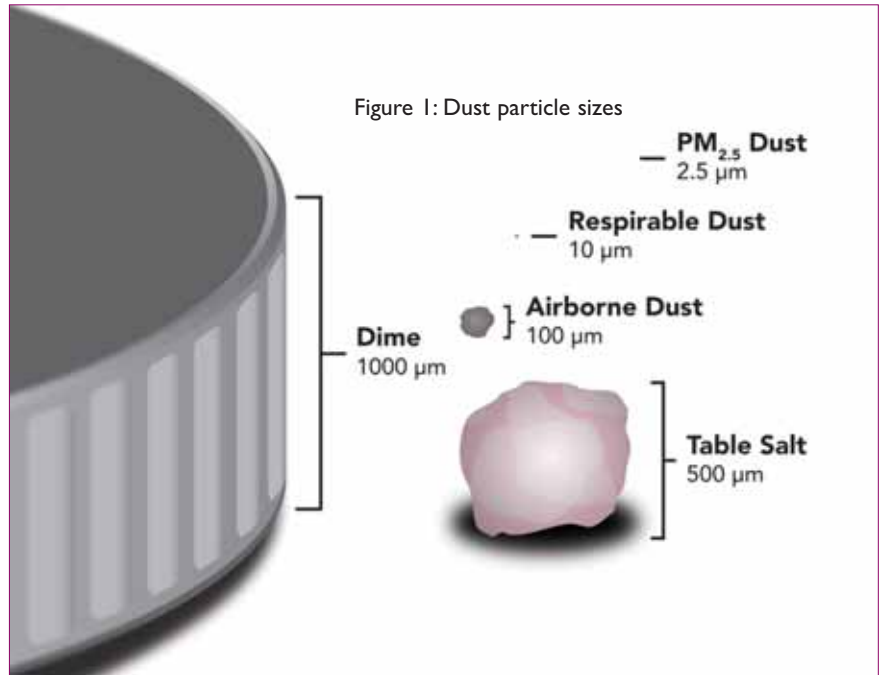
The relationship between safety and the lower cost of operation is well established, and air quality is a key factor.<sup>[1]</sup> Whether testing levels of RCS or other airborne particulates, measurements are typically made using gravimetric dust samplers or continuous personal dust monitors (CPDM). Both devices measure particulate matter (PM) of <10 micrometers in diameter at a volume in micrograms (µg) or smaller within a cubic metre (m<sup>3</sup>) area. Particles of PM10 are the size of pollen and

can penetrate deep into the lungs, causing chronic respiratory diseases such as silicosis and pneumoconiosis (black lung). According to MSHA, mines must protect workers if they have an amount of RCS dust above the personal exposure limit (PEL) of <PM10 at >50µg/m<sup>3</sup>, averaged over an eight-hour day as measured by a CPDM.<sup>[2]</sup>

[1] Swinderman, R. Todd. "The Economics of Workplace Safety". *Coal Age*, Vol. 123, No. 3, pg. 28-31. April 2018. <https://www.coalage.com/features/the-economics-of-workplace-safety/>

[2] "Lowering Miners' Exposure to Respirable Coal Mine Dust Including Continuous Personal Dust Monitors". *Federal Register* Volume 79, Number 84, Pages 24814-24994. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances. March, 2014. Washington D.C., USA. <https://arlweb.msha.gov/regs/fedreg/final/2014fjn/2014-09084.asp>

Beyond the health and compliance implications, even dust emissions as large as PM200 — the size at which most particles remain airborne and travel on ambient air currents — can cause issues that result in work-related illness, equipment break-downs and costly downtime. Abrasive dust fouls rolling components and causes them to seize, leading to friction damage on the belt and a potential fire hazard. In addition, fugitive emissions can obscure visibility and cause a serious workplace tripping/falling hazard, as well as making inspections and routine maintenance difficult without a system stoppage. Lastly, dust drops along the belt path and settles on surfaces, requiring staff to clean under and around the conveyor, which increases labor costs and raises the possibility of employee contact with the moving belt if the activity is not done during scheduled downtime.



**CONTROLLING MINING DUST FROM CONVEYORS**

Dust in conveying begins at loading raw material into the first hopper and persists even after it has left the premises by truck, train or barge. However, there are several methods to suppress and control the emissions during conveyance. Based upon the availability of water and power, along with space to accommodate transfer chutes and other components, some methods may be more effective than others. These include:

- ❖ containment / prevention
- ❖ collection
- ❖ suppression

**CONTAINMENT**

During the transfer of bulk material to, from or between conveyor systems, a tremendous amount of dust can be created. Without adequate belt support

and sealing, as material hits the belt, the turbulence created by the impact can propel dust and fines out of the chute, filling a large area. The lingering dust then either drifts on wind patterns throughout the worksite and travels outside of the site line or extends long distances down enclosed shafts with the directional airflow of the mine. High wind areas may require the conveyor to be enclosed from stringer to stringer, whereas indoor transfer points may just need a properly-designed transfer point.

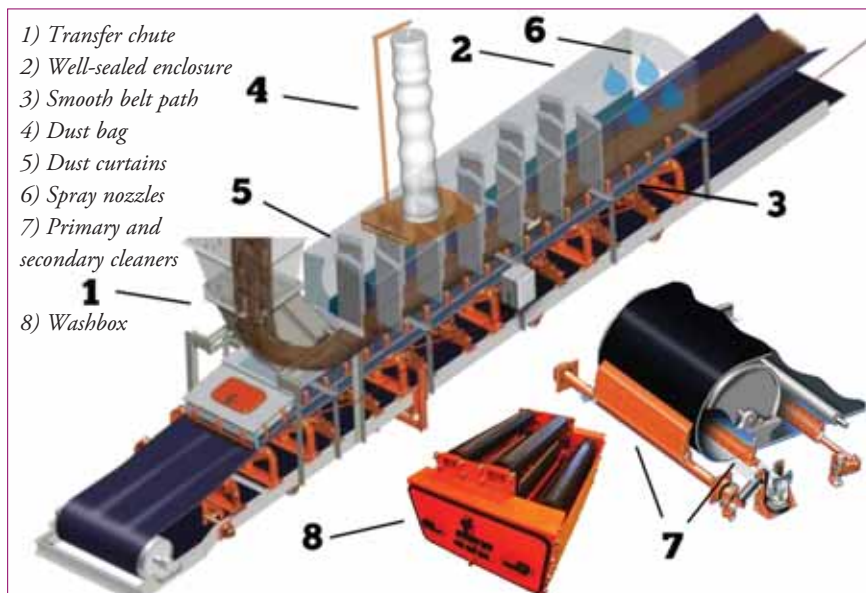
In most cases, installing a well-designed transfer chute reduces the dust-causing impact of material on the belt, and a longer and taller settling zone gives dust more space in which to settle. Impact cradles and slider cradles with force-absorbing SBR rubber followed by closely placed idlers reduce turbulence in the loading zone and belt vibration through the settling zone. By

using self-adjusting external double skirting, dust is contained within the chute, allowing more control over the material flow. To stop rapid airflow from ejecting dust out of the entrance and exit of the chute, a tail box and dust curtains placed along the settling zone slows air and promotes settling back onto the cargo flow. This controlled airflow also improves the collection of particulates.

**COLLECTION**

Two common pieces of filtration equipment are dust bags and mechanical air cleaners. Installed above the conveyor loading zone, dust bags or ‘baghouses’ are passive dust collection systems that capture dust without energy consumption. In a well-sealed chute with properly controlled airflow, the air is directed through the upper openings, where dust collects in the fine mesh bag. Bags require regular monitoring and, once full, stoppages in the system allow the bag to relax and the collected dust to fall safely onto the belt. Applications with combustible dust should consider using ‘static dissipating bags’ and proper grounding, or a mechanical air cleaner if a power source is available.

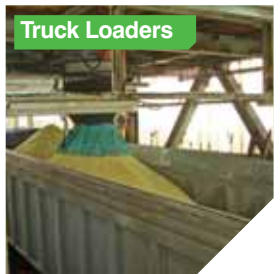
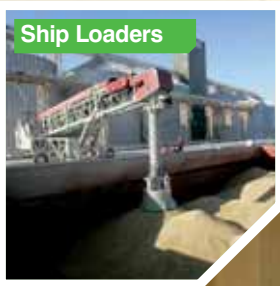
A centralized dust collection system has ducts installed above conveyor transfer points and uses a powerful fan to draw in and capture airborne dust, collecting particles in a filter or hopper. Larger central dust collection systems pull dust from many points and dispense into a designated vessel. Central systems are a large investment that require constant maintenance, however, and they tend to develop leaks in ductwork over time, resulting in pressure loss and more





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maintenance.

Transfer zones that cannot accommodate long ducting runs or large enclosures may need a more efficient and compact solution. Integrated air cleaners are individual collectors that use a reverse pulse in the collection chamber to return dust to the main cargo stream. With efficient power consumption and a lower cost of operation over centralized systems, as well as less downtime and easier maintenance than baghouses, operators have found air cleaners offer a better return on investment over the long term. [Figure 2]

**SUPPRESSION**

There are many opportunities to treat the cargo stream with liquid to control dust, such as when the material is entering the hopper, transferring between conveyors, post-crushing or during discharge onto a stockpile. The main element for treating material is water, weighing down particulates to prevent them from becoming airborne. However, the addition of water to the material can have harmful effects on the material's flow and handling, such as screen clogging, chute plugging and increased carryback. An additional obstacle is that some mined substances are hydrophobic, meaning the water beads up and rolls off the surface rather than promoting absorption and caking.

Chemical binders and surfactants — when added to water at the adequate dosage and properly applied to the substance in an engineered spray or fog — can overcome the hydrophobic properties of materials and cause them to agglomerate. The hydrophilic properties of

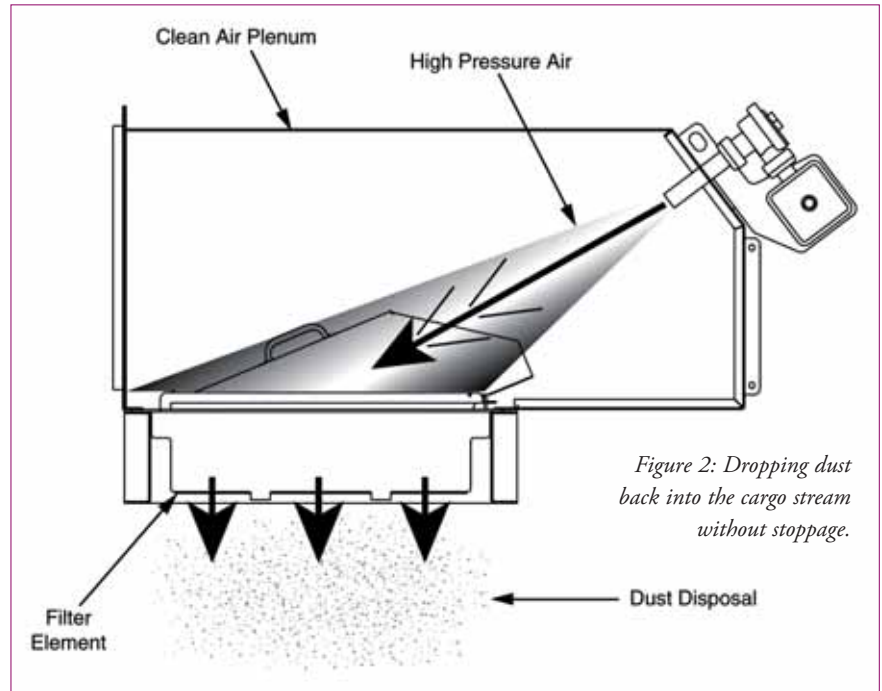


Figure 2: Dropping dust back into the cargo stream without stoppage.

the surfactants allow the larger water molecules to encapsulate the minute dust particles, while the binders work to agglomerate the particles, thus overcoming the size and physical property challenges of the specific ore being treated. [Figure 3] The delivery system should be able to control the water pressure, regulate chemical dosing and be integrated with sensors to start and stop the flow of liquid in order to avoid waste.

Dust is an ever-present element of the bulk handling process, so absolute prevention is impossible. Containment, collection and suppression address the majority of the emissions, but the smallest and most regulated particulates are elusive. Hiding in the cracks and divots of belts and

on the walls of chutes, dust particles must remain in the cargo flow or collection devices to qualify as “controlled.”

Vibrators connected to the outside of vessels in problem areas and air cannons discharging in the direction of the cargo flow can prevent dust buildup. In addition, they mitigate clogging and dislodge dust so that it remains in the material flow and can be properly addressed using dust control methods.

One of the toughest problem areas is dust dropping from cracks and divots in the belt during its return. Using appropriately-specified primary and secondary cleaner blades can go a long way to achieving full discharge, but operators handling fine particles such as limestone or combustible dust like coal may still experience carryback issues and should also consider installing a washbox. The system combines water spray and secondary cleaning blades in an enclosed and self-contained unit, draining residue safely away from the work area. Operators who have installed the systems have drastically reduced dust and spillage from carryback.

**BEST PRACTICES**

Assessment should begin internally before any decision on equipment is made. By implementing some best practices, operators can discover problem areas throughout the transport process and address them. Best practices for dust management around belt conveyors include:

- ❖ Conduct a hazard analysis to determine the fire risks, employee exposures and whether there is adequate fire and

Dust-Suppression Application Matrix							
Type of Dust-Suppression System	Applications That Have:						
	Transfer Point	Crushers & Mills	Stock Piles	Rail Car Dump Station	Trippers	Ship Loading	Ship Unloading
Water Spray	X			X			
Water Fog	X						
Water + Air Fog	X			X		X	
Water + Surfactant Spray	X		X	X	X	X	X
Foam	X	X	X		X	X	
Hybrid System Dust Suppression + Passive Dust Collection	X	X					
Hybrid System Dust Suppression + Active Dust Collection	X	X		X			X

**Notes:** Water + Surfactant Spray and Foam are best when a residual effect is needed (multiple application points, crushers, long distances between application points, stackers, etc). Water Spray, Water Fog, and Water + Air Fog are best when a residual effect is not required. Some kinds of materials and/or processes do not permit the addition of any chemical.

Figure 3—Several treatment options allow different methods to work in tandem.

*Double skirting seals along the edges of chutes and settling zones to prevent dust from escaping.*



dust to billow out the sides of the chute, fill the shaft and restrict visibility. The mechanical filters were eventually abandoned, unable to keep up with the volume of dust.

Fugitive dust would travel freely throughout the long shaft, piling up and restricting access by maintenance workers. Abrasive material would get into the bearings of rolling components and cause them to seize, leading to increased friction on the belt – a potential fire hazard. Dust would quickly build up around the loading zone and encapsulate the tail pulley, which fouled the return side of the belt and the face of the tail pulley.

To maintain normal operation of the system, the area was cleaned by two workers once per week, requiring nearly an entire shift. Anyone entering the enclosed area was required to wear personal protective equipment (PPE), including breathing masks with respirators and hooded suits to protect against airborne particles. Workers first had to clear thigh-deep piles of dust from walkways and around the mainframe using the plant's central industrial vacuum system, in order to access the conveyor for inspection and maintenance. [Figure 4]

To address the issue, a 4-metre-long (13-foot) chute extension and tail box were

explosion protection.

- ❖ Take a holistic view of the entire system with the minimization and containment of fugitive dust as a major consideration.
- ❖ Use experts to help determine the best approach at each step of the flow process.
- ❖ Install dust-suppression and/or dust collection technologies where compatible with conveyed material, process and budget.
- ❖ Inspect and maintain the dust management systems regularly.
- ❖ Implement regular and safe cleaning schedules and procedures.
- ❖ Initiate measures that achieve or surpass regulatory compliance to preserve the respiratory health of staff working on or around conveyors in dusty conditions.

has been calcined and reduced to 50mm minus (2in. minus) in a crusher, 100mtph (metric tonnes per hour — 110 tons per hour) of dry aggregate is sent through a transfer chute system that loads onto the GLCI conveyor. The chute is a 7–8m (approximately 25 feet) dead drop onto a troughed 600mm (24in) wide belt running at 2mps (393fpm).

Located in an enclosed shaft with a walkway, the loading zone was surrounded by an unsealed chute with no settling zone and two top-mounted mechanical dust filtration systems to address emissions. The turbulence from the impact caused

**CASE STUDY: FROM ZERO VISIBILITY TO CLEAR AIR**

Outside of Barnetby, UK, the Melton Ross Quarry is the source for limestone to Singleton Birch Ltd, a global provider of quicklime producing approximately 1.5mtpa (million metric tonnes per year — 1.65m tons/annum) of processed limestone and chalk. After the quarried raw limestone

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Scrap Metals | Bagged Materials | Iron Ore | Copper Concentrate



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Figure 4: Singleton Birch loading zone.



Figure 5: Loading zone after upgrade.

installed. The overhaul included double skirting to seal in dust and a series of dust curtains to reduce turbulence. The mechanical dust filtration system was cleared and returned to operation. By raising and extending the loading and settling zone and controlling the airflow both in the front and back of the chute using the tail box and dust curtains, dust was given the space to settle. The double skirting includes a primary strip that holds a tight seal on the belt to trap fugitive dust and the self-adjusting secondary seal rides smoothly on the belt to provide extra dust containment.

According to operators, spillage and accumulation along walkways and around the mainframe have been eliminated. There has been no encapsulation of the belt or tail pulley since installation, and rolling components are far less prone to fouling due to dust and spillage. Protective suits are no longer required for people to enter the area, as they need only PPE masks to protect against trace particles emitted through normal operation. [Figure 5]

**COST/BENEFIT**

With applications that emit excessive dust,



An air filtration system placed over a sealed loading zone delivers efficiency and low maintenance.

operators should expect to take extra measures to protect workers by installing safer and more efficient equipment as a cost of doing business. After modern dust control technology has been installed, managers often discover that the return on investment (ROI) involves several factors:

- ❖ reduced chance of injury to employees

working on or around moving conveyors;

- ❖ lower labour costs for cleanup and maintenance;
- ❖ less unscheduled downtime and equipment failures due to fouled components;
- ❖ more consistent cargo flow and



When the system is on, the dust bags inflate, and stoppage releases the dust back to the belt.



- improved production;
- ❖ reduced scrutiny by regulators and fewer compliance violations/fines; and
- ❖ better relations with neighbours.

### CONCLUSION

Workplace-related respiratory issues have been a concern of health advocates and government agencies for decades, and dust regulations are the natural product of those concerns. Every application is unique, and no bulk handling operation is going to be 100 percent clear of dust, but actively mitigating emissions makes for a healthier workplace, extends the careers of experienced trade workers and helps minimize the overall cost of workplace-borne respiratory diseases.

In order to remain compliant, operators are assessing their systems and addressing emission points. Modern conveyor system design follows material through the entire process and addresses every instance where dust is created, ensuring that it is contained, collected, treated and prevented. Operators who have updated and retrofitted problem systems have said that,



*Enclosed and well-designed chute structures ensure a safe and clear work environment.*

in most cases, they have enjoyed a relatively fast return on investment and improved employee morale.

### ABOUT MARTIN ENGINEERING

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company's series of Foundations books is an internationally-recognized resource for safety, maintenance and operations training — with more than 20,000 print copies in

circulation around the world. The entire 500+ page volumes can also be downloaded as free PDFs from the Martin web site. Martin employees take an active part in ASME, SME, VDI, CMA and CEMA, and the firm played a pivotal role in writing and producing the 7th edition of the CEMA reference book, *Belt Conveyors for Bulk Materials*.

Martin Engineering products, sales, service and training are available from factory-owned business units in Australia, Brazil, China, Columbia, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK.



## ALL WE NEED IS THE AIR THAT WE BREATHE

TAKRAF's in-house range for air pollution control is comprehensive, enabling the selection of the most cost effective solution to any dust/fume control, air cleaning or product recovery problem, large or small. Our systems are designed, manufactured and supplied as turnkey installations with full after-sales service.

TAKRAF is an integrated solutions provider to the global mining, bulk material handling and minerals industries, offering innovative technological solutions as well as process and commodity knowledge along the industry value chains.



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Tenova, a Techint Group company, is a worldwide partner for innovative, reliable and sustainable solutions in the mining and metals industries. [www.tenova.com](http://www.tenova.com)

**TAKRAF**  
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## Dust collection: the key to cement production from beginning to end

Large flows of hard and abrasive dust particles are typical in all mining and mineral processing-related applications. This dust type rapidly wears out filter media, leading to frequent maintenance — or worse, filter leaks. Without effective dust emission control, equipment, processes, employees and environment are put at risk and production can be halted. As a global provider of filtration solutions, Donaldson experts offer a quick dive into dust filtration during cement production.

Cement manufacturing offers particularly difficult challenges to dust collectors. Based on data from installations, it has been estimated that as much as 1% of mining throughput can be lost to the surrounding environment. For a 700tph (tonnes per hour) quarry, that's about seven tonnes per hour lost from conveyors, crushers and screens, not including losses from stockpiles.

Although mineral dust may look like any other dust and its filtration technique appears to be straightforward, it is essential to carry out a more thorough analysis as the difference between an effective and ineffective dust collector is often much narrower than in many other industries.

To understand filtration needs in cement production and articulate relevant recommendations, it is necessary to take a closer look at the specific application and at the dust itself.

Dust is generated during all phases of mineral exploitation and processing from fugitive sources; the main ones being crushing, grinding, drilling, blasting, and transport. Three parameters help measure the impact of dust emissions during cement production: size (e.g. whether it is less than 2.5 microns in diameter), main components (e.g. silica, silicates, carbonates), and other rock impurities and trace components (e.g. asbestos).

When it comes to dust control design, we must take into consideration the



tally-friendly way. Below are some of the company's tips.

### THE FILTRATION CHECKLIST FOR CEMENT AND MINERALS INDUSTRIES

#### GOOD DESIGN AND EQUIPMENT SELECTION IS ESSENTIAL

Dust collection is the ultimate controlling mechanism of dust emissions for the entire processing equipment spectrum, spanning across crushers, grinders and screens. In other words: dust collection is crucial for keeping production, employees, and the environment healthy. When it comes to dust control design, it is important to take into consideration the final use of extracted material and develop systems which capture diverse airflow patterns, by factoring in parameters such as incoming air velocity, dust distribution, and air patterns within the collector.

#### SOURCE OR CENTRAL?

A simple, linear layout for material-handling operations is necessary to reduce the need for multiple transfer points during extraction. Two basic strategies exist for applying dust control to cement manufacturing process.

- ❖ Source collection, in which the dust collector is put at the source of the dust emission so collected dust can be deposited directly back into the process stream, reducing the need for ducting; and
- ❖ centralized collection, where the collector is put in a central location and dusty air is ducted and discharged as a separate process stream.

process and the form factor of extracted material to develop systems which capture diverse airflow patterns and are able to cope with high temperatures, high humidity and possible high dust load during short time frame

What are the main filtration challenges faced during cement production? As a single filtration source for mining and minerals, Donaldson helps navigate the complex world of dust collection specifically for the cement industry in the most efficient and environmen-



  
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Image: LISTENOW Loading System 4030 with fill-level indicator

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Source filtration reduces maintenance problems as fewer ducts or hoppers are being used that can block or bridge. In addition, the shutdown of one unit may result in temporary increased emissions in a single area but will be unlikely to necessitate a complete plant shutdown.

**LIMIT DUST DISPERSAL**

When it comes to moving process dust, procedures to limit the drop height of falling materials should be adopted. Cement dust is so abrasive that even prolonged contact with equipment surface can cause extensive damage. Mobile and fixed-belt transport and conveyors are superior to transporting material by trucks through internal roads as they limit emission levels and reduce dust dispersal. For maximum efficiency, opt for closed rubber-belt conveyors in combination with flexible and effective filter mechanisms.

**OPERATIONAL SAVINGS**

The rough circumstances of cement processing and the sticky, adhesive cement and lime dust can dramatically shorten filter life and increase the risk of production blockages, equipment abrasion and secondary dust emissions, blowing up the budget for maintenance and material handling.

Donaldson's innovative technologies, such as Ultra Web® and Tetratex® filter media, provide phenomenal surface loading

and superior dust release. It is proven that surface loading secures lower pressure drop and prolongs filter life. As a result, Donaldson filters last up to three times more than conventional filters and eliminate unplanned production shutdowns<sup>1</sup>. Significant savings in power consumption can be achieved by maintaining required airflow at a reduced filter DP. Surface filtration principles inhibit particle migration resulting in increased cleaning efficiency.

Excellent cake release capability and low cake formation allows for reduced cleaning and less mechanical stresses. This helps to prolong bag life and reduce filter changes.

**WIDE RANGE OF AIRFLOWS, FROM SMALL TO VERY HIGH, AND LIMITED SPACE FOR DUST COLLECTION SYSTEMS.**

When looking at cement production, there is clearly a highly complex process which involves different types of trucks and machinery with diverse filtration needs. From robust modular baghouses to proprietary, lighter and smarter techn-

ologies such as PowerCore®, Donaldson offers a highly flexible product range covering from low to very high airflows.

**FILTRATION IN A NUTSHELL: WHAT TO LOOK FOR FROM YOUR FILTRATION EXPERTS IN MINERAL AND CEMENT INDUSTRIES**

Whether it is a new or an old installation, Donaldson filtration experts have the experience and the extensive technical capabilities to deliver the best solution with the smaller costs over the operation lifetime.

- ❖ increase of final output;
- ❖ longer production uptime by improved filter application and maximized operational parameters;
- ❖ elimination of production blockages;
- ❖ better ambient dust control;
- ❖ significant increases in filter life and maintenance predictability;
- ❖ improved energy savings by maintaining a lower operational DP and reducing compressed air usage; and
- ❖ emission reduction and compliance to environmental norms and regulations.



<sup>1</sup>. Results derived in accelerated lab tests, which correlate to field tests results, showing that Dura-Life will provide 2-3 times more life than standard 16oz. polyester bag filters when replacing bags due to pressure drop.

## Dust solutions by Den Bakker Dustcrusting technology



[1] DUSTCRUSTER DRY (available in FIBCs)



[2] Mix with water on site.



[3] Pump DUSTCRUSTER into spraying tank.



[4] Spray Dustcruster liquid.



[5] It forms a 'crust' which safeguards the product from being lifted by the wind and transporting dust.



### THE DUSTCRUSTER® SOLUTION

Den Bakker Dustcrusting technology b.v., (dbd global), is an expert in dust control and prevention. Dust is everywhere. It is not always visible, but it often creates problems.

Ever more stringent environmental legislation regarding dust control with sometimes very high fines when insufficient measures are taken is putting pressure on the management of many a company. Den Bakker Dustcrusting technology specializes in the control of dust, not only by cleaning the areas that are already dusty, but also — and most importantly — working to ensure that dust does not become a problem in the first place.

Being heavily involved in this matter as a contractor for now more than 30 years, the company has developed a range of solutions to help with dust control, including a range of specially designed spraying vehicles each having particular capacities and performances to suit the needs of a specific site or condition. The constant desire to improve led to the development of a very effective method to control dust, far better than spraying pure water or using nasty chemicals: the Dustcruster® technology.

Den Bakker Dustcrusting technology has a solution for tackling dust problems commonly connected to storage of large stockpiles of coal, coke, petcoke, iron ore and similar products.

The product is called Dustcruster dry® and consists of a selected blend of several types of cellulose fibres pressed into pellets.

The advantage of using pellets instead of ready mixed product is that it can easily and cost effectively be transported and stored as dry bulk or in FIBCs (big bags) to the actual site where it is needed.

Once on site, Dustcruster dry® can then be dissolved into the sprayable product Dustcruster liquid® by adding water and using the company's special mixing installation.

The next step is to spray Dustcruster liquid® employing special spraying trucks covering the coal/iron ore stockpiles hence creating a tough and long-lasting and clearly visible white crust even in tough atmospheric conditions.

the management of many a company.

Den Bakker Dustcrusting technology's products are unique and environmentally friendly (natural). With the strict legislation rules, the company can help, not only with dust problems, but also with a product that is organic.

Dustcruster liquid® for example, is an organic product and has been proven to be a great solution because of its longer

setting time.

After spraying the product on the wanted area, it forms a real 'crust'. This crust safeguards the product from being lifted by the wind and transporting dust, and lasts for a very long period. Rain hardly affects the protective layer. If untouched, it can last for many months.

When there is a need to separate stock piles, there is the possibility to use different colours with the product Dustcruster liquid®. This way it is easier to separate stockpiles with a different quality, supplier or age for example. As the environment is very important, also with this product customers can be sure that the colour is organic, biodegradable and not of any influence on the product.

Normal rain does not affect its effectiveness whatsoever.

Even with very heavy rainfall (that is more than 100mm in one night) there is still a tough and long lasting crust of Dustcruster®.

Only after digging or disrupting the stockpiles is it necessary to repair the

*The advantage of using pellets instead of ready mixed product is that it can easily and cost effectively be transported and stored as dry bulk or in FIBCs (big bags) to the actual site where it is needed.*



*The dbd global dustcrusting® team is always willing to come over to a site to give a live demo.*





*Dustcruster liquid can be applied in different colours to differentiate between stockpiles.*

crust by spraying on a new layer at the clearly visible disrupted area.

#### **DUSTCONTROL DEMONSTRATION WITH THE DBD GLOBAL DUSTCRUSTING® TEAM**

For potential customers interested in Dustcruster® but not yet fully convinced that Den Bakker Dustcrusting technology's system will solve their dust problems, the company is willing to come over to the site with everything required to perform a live demo.

For this purpose there are two options and the company will select either the fully autonomous system which it brings on its semi-trailer lowloader, or, for overseas destinations, the containerized kit can be despatched.

In both cases, the demo is performed by Den Bakker Dustcrusting technology's specialized team.

Based on where the yard is situated, Den Bakker Dustcrusting technology will gladly book a visit by its demo team.

#### **COMPETITIVE PRODUCTS**

Typical products that are proposed by other companies are on a chemical basis but most of Den Bakker Dustcrusting technology's Customers – after having tried the chemicals – prefer Dustcruster®.

Dustcruster® offers the following competitive advantages:

- ❖ it contains the dust;
- ❖ is long-lasting;
- ❖ it is clearly visible;
- ❖ it is environmentally friendly; and
- ❖ it is competitively priced

#### **EXTENSIVE EXPERIENCE**

Den Bakker Dustcrusting technology b.v. has gained vast experience in the control of outdoor dust. The company uses advanced systems, stationary as well as mobile, which can operate under the most severe conditions. Frost and strong winds present no problems for the company's equipment.

Den Bakker Dustcrusting technology knows that each environmental problem needs its own approach and solution, and it enjoys the challenge of developing appropriate solutions for its customers, round the clock, seven days a week.

# DUST!

The headache of each terminal operator!

We have the solution:

# Dustcruster®!

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## Dust, a general problem no more – a NEUERO case study

*At the Port of Rouen, Jet slingers generated an extreme amount of dust during the loading operation.*



*Previous S loader 600tph with jet slinger.*



In 2013, Senalia planned to replace the existing loading and unloading equipment in the Port of Rouen in France. Two old loaders each with a capacity of 600tph (tonnes per hour) would be replaced with one new loader with a capacity of 1,200tph capacity.

Senalia personnel made technical visits and also received visits from various suppliers to discuss the best technical solution. In addition, company representatives made several trips to see equipment around the world, and in the end they made the decision to purchase the Neuero-designed shiploader equipped with KIKO (kick-in, kick-out) and the DSH loading head. In 2014, the new shiploader was delivered, assembled, and successfully commissioned.

To replace two loaders, each with



600tph, with one 1,200tph required connecting two feeding points at the same time to combine the volume to the required 1,200tph loading rate. The existing jetty-side conveyors had fixed

loading points, so the new loader would need maximum flexibility to cover the ships' hatches. The old equipment had slewable jet slingers attached at the end of the vertical telescopic loading pipe.

Additionally, the old equipment had a slewable horizontal boom with a telescopic belt to cover the hatch area. Unfortunately, the use of jet slingers generates an extreme amount of dust during the loading operation, making it impossible to see though the dust. The old loading operation required one



man in the main operating cabin, and a second man with an oxygen tank at the hatch opening to give instructions to the main operator. For the operators these were very



Before (above) and after (right).

poor working conditions 24 hours per day.

After the delivery and start-up, the new shiploader achieved the same capacity with one loader instead of two, with practically no dust during the ship loading operation.

After seeing the actual successful result of the Neuero shiploader with KIKO and DSH loading head, Senalia has decided to change three shiploaders at a location in Gran Couron.

The space at the jetty does not allow for assembly on site, so the new equipment must be delivered completely assembled. By end of 2018 there will be three new Neuero SL1000s in operation, resulting in a considerable reduction of dust emission in Rouen. With a considerable dust emission reduction, the port area will be attractive

and valuable for other enterprises even residential.

Senalia is a good example of a client that is interested in new technologies offering improved operating results. Neuero commonly sees potential clients still making new investments in old technologies, resulting in environmentally unfriendly equipment and also poor working conditions for their people.

Neuero thanks Senalia for being open to allow visitors to see their new ship loading equipment and see the advantages



SL1200 with KIKO and DSH loading head.

this design provides. This is very important to Neuero, so its potential clients can see the results first-hand and also talk with the equipment operators.

wuvio

## Wuvio deals with food and feed dust

Handling food and feed causes a lot of dust issues which creates serious treats for people's health. There are more and more mixed transshipment terminals where coal or ore is being handled and food or feed. Then dust can blow away from one site to the other and can precipitate on the material and cause cross contamination. The right dust control can prevent this.

*Wuvio offers innovative solutions for dust suppression.*

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WE DEAL WITH DUST

## Mideco's Burnley® Baffles for wharf hoppers

Mideco is an Australian-owned company that specializes in providing innovative, efficient and cost-effective dust control products and solutions for mines, quarries and any commercial environment.

In over 60 years in the industry, Mideco has successfully completed many projects that involved design and supply of quality dust suppression and collection systems for wharf bulk load and unload facilities.

Burnley® Baffles is Mideco's internationally patented dust suppression device specifically designed to reduce the escape of dust from dump hoppers and chutes handling dry granular bulk raw materials such as grains and ores. Burnley® Baffles are utilized in applications including ship unloading, rail unloading, truck unloading, bag tipping, drum tipping, and front end unloaded material transfers.

It is an extremely efficient dust suppression solution for wharf hoppers. When applied to a hopper alone Burnley® Baffles can eliminate up to 80% of dust. With an additional dust collector applied directly to a hopper 100% of dust can be eliminated.

It is one of Mideco's best known products and has been successfully installed at various facilities in Australia, the US, Canada, Israel, Ukraine, New Zealand, China, UK and Ireland amongst others.

Burnley® Baffles are easy to install, virtually maintenance free and can be customized to a hopper of any size. They are available in various sizes to suit different types of dry granular bulk raw material such as cement, phosphate, coal, grain, feed, many ores, and powders. There are five models available in total, depending



on what dry granular material is involved.

Another advantage of using this dust control system is time saving. Installing Burnley® Baffles on site enables staff to continue working while the material is being unloaded. There is no longer any need to wait for the dust to settle.

A Burnley® Baffles installation consists of a set of modules that fill the open inlet face of a hopper. Each module contains a set of blades that pivot to allow the material to flow into the hopper. The dust generated from the material falling into the hopper cannot escape because the hopper is only open where the material is entering.

The following are just a couple of wharf hopper projects that Mideco has been involved in.

In 2004 Mideco has been assisting Impact Fertilisers, a leading supplier of fertilizer products and services in Australia. Mideco was requested to design and supply a dust suppression system that would reduce dust during the phosphate rock ship unloading in Hobart, Tasmania. After a few consultations with the client Mideco recommended Burnley® Baffles phosphate pattern model with 3mm galvanized steel. The Baffles for each application are designed with a specific pattern to match the material characteristics. The 49 units were successfully installed and are still working at Nyrstar facility in Hobart today.

Another project where Burnley® Baffles were utilized specifically for wharf hoppers was completed for Geraldton Engineering. Mideco was approached to assist with dust control during unloading of soda ash in Port Geraldton, WA. After considering the site and the project, Mideco recommended Burnley® Baffles, model 2. The company designed and supplied 64 units of Burnley® Baffles made with galvanized steel of 3mm thickness. Depending on the material used, the steel thickness can vary between 1.6mm thick for grain to 10mm for customized applications. The Baffles were successfully installed in a hopper used by WA Mercantile.

Whatever the product, Mideco can provide dust control solutions for the most challenging of wharf hopper projects.

Mideco's environmental technologies can help clients companies deliver results while taking care of their most precious resource – people.



## Dino has a dust solution for any load

The Dino mobile bulk truck loader is mobile to use and can load quickly, simply and safely. But how does it actually perform in terms of preventing dust forming during loading? Does a mobile bulk truck loader actually have solutions for this problem? Van Beek has decades of experience with regards to loads and over that time the company has developed numerous innovative solutions.

### CAN BE USED ON ANY DINO

A particular property of all these solutions is that they can be used on any Dino, even if it is a decade old. Van Beek has in fact developed modules that can be attached to any Dino.

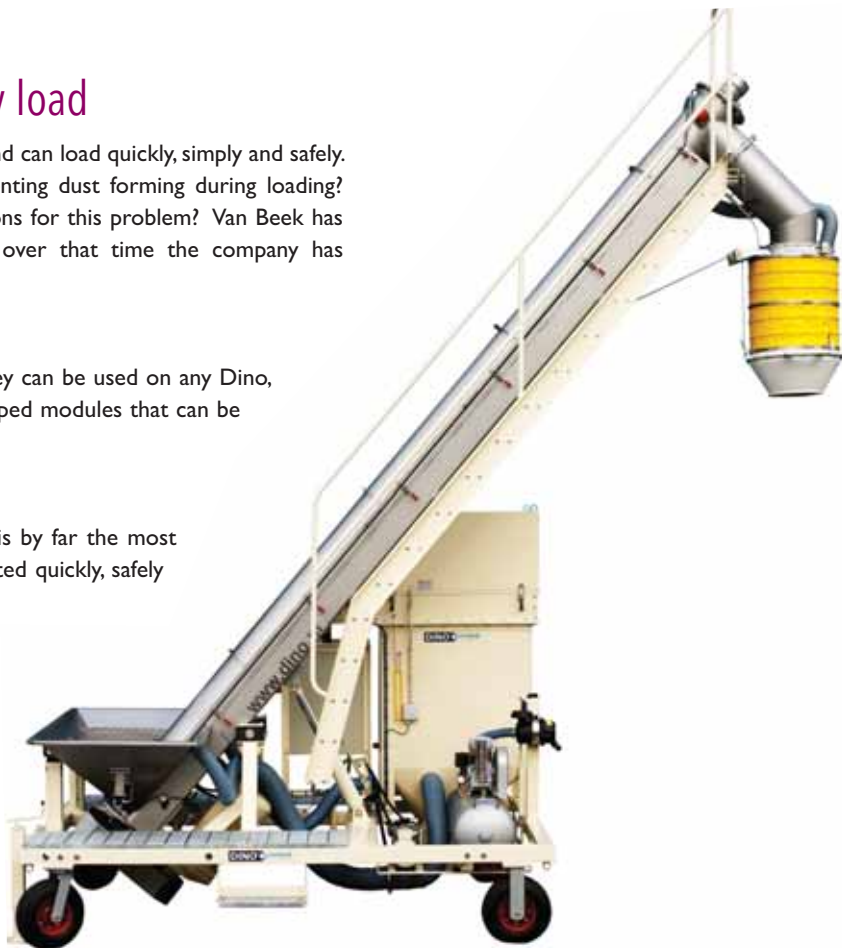
### THE CHEAPEST AND MOST EFFECTIVE WAY

The loading bellows on the outlet side of the Dino is by far the most popular means of reducing dust. This can be connected quickly, safely and efficiently to the manhole on the top of a bulk truck and for a small investment eliminates a lot of dust development.

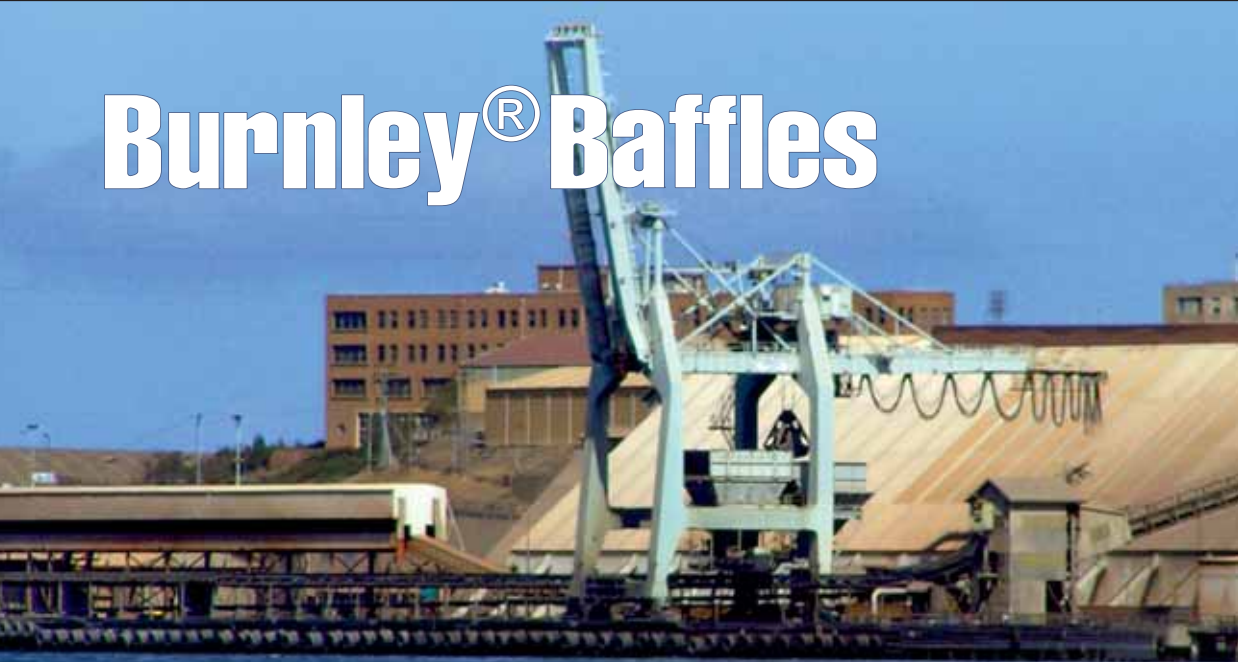
### MORE SAVINGS WITH EXTRACTION UNIT

The loading bellows can be connected to an extraction unit. This creates a negative pressure in the loading compartment and so fewer fines or small particles escape during loading.

The next logical step in dust reduction is to connect the inlet hopper of the Dino to the extraction unit. The unit immediately extracts most of the dust that is released when emptying big bags or 25kg bags.



# Burnley® Baffles



## Burnley® Baffles

The most efficient dust suppression system for Wharf Unloading Facilities  
 Up to 75% dust reduction without the use of additional Dust Extraction equipment  
 Financial savings on the overall Dust Collection system are in excess of 50%  
 Maintenance free solution

[www.mideco.com.au](http://www.mideco.com.au)  
 Email: [sales@mideco.com.au](mailto:sales@mideco.com.au)



### OPERATION OF DUST FILTERS

The extraction unit extracts the dust through a row of filters. At set times a blast of air passes through the filters, this knocks out the dust which then falls into an easily removable collection bin underneath. To minimize product loss Van Beek can fit the filter unit above the body of the Dino and fit it with a rotary valve. The dust particles collected and knocked out of the baghouses then fall straight back into the product stream.

### UP TO 30M<sup>2</sup> FILTER AREA

The standard Dino filter has a total area of 12m<sup>2</sup>. "In some cases a bigger filter area is wanted," says Roel Kneepkens, sales engineer at Van Beek. "We have developed a module for this with a filter area of 30m<sup>2</sup>."

### DUST PREVENTION FOR LOADING FROM BIG BAGS

Whether you are now loading from big bags, a shovel or 25kg bags, the Dino has a suitable dust-reducing module for this application. For big bags with a flexible hose underneath, Van Beek can fit the cover on the inlet hopper with a round hole into which the flexible hose fits precisely. In combination with an extraction unit this gives minimal dust development. Van Beek can fit the inlet hole with a flexible hose clamp for even less dust in the warehouse or logistics department.

For big bags with no flexible hose, Van Beek fits the inlet hopper, a sort of big open metal box, with cutters that cut a cross in the bottom of the big bag. The product then runs straight into the Dino, during which process a minimal amount of dust can escape.

### FILLING CABINET FOR SMALLER BAGS

For smaller bags the Dino can be extended with a lockable filling cabinet. The operator lays the bags on a screen and cuts them open. The product then falls straight into the Dino.

### CAN ALSO BE EXTENDED LATER

By working with modules, the Dino can also be adapted to new situations or requirements even years after its purchase. "For example we had a client who had bought a Dino 12 years ago to load granulates. They had now changed over to powders and this created a lot of dust. By fitting the Dino with dust extraction and a loading bellows the problem was solved in an instant," says Kneepkens.

### DEMAND FOR DUST REDUCTION GROWING

Due to more stringent requirements for the protection of personnel, according to Kneepkens clients are increasingly often extending the Dino they have already been using for years with dust-reducing modules. "You see fewer and fewer logistics departments where the personnel always wear a dust mask for their work because of dust clouds. Companies are doing all they can to reduce dust and by upgrading their Dino a great saving can be made for a low investment."

### DINO REMAINS MOBILE

The strength of the Dino is that it is mobile and can load quickly, simply and safely. When developing the dust-reducing modules, Van Beek has taken great care that the Dino retains these positive properties even with its extensions. So even with an extraction unit or an extra-large filter area the Dino remains mobile, quick and safe.

*A particular property of all the solutions offered by Van Beek is that they can be used on any Dino, even if it is a decade old. Van Beek has in fact developed modules that can be attached to any Dino.*



## Busy port uses Dust Control Cannon for handling & storage of commodities

The Port of Coeymans, located along the Hudson River in the USA, employs two DustBoss® DB-60™ atomized mist cannons from BossTek® for dust suppression in a variety of activities and applications. One machine is mobile, used to control particle emissions during the unloading and storage of bulk materials. The other is tower-mounted to suppress particulates at the metal scrap yard. This provides operators the versatility to address surface suppression and airborne control at different areas of the port, resulting in a drastic reduction in fugitive dust.

About 40-50 vessels per year arrive from Greece, Turkey, Egypt and Spain, delivering nearly 33,000 tons (30,000 metric tonnes) per week of clinker, a dry chalky substance used as a binder in cement products. When the ship arrives, large clamshell shovels controlled by tower cranes unload the material from the ship's cargo hold, over the ship's deck — from 25 feet (7.5 metres) to as high as 120 feet (36.5 metres) in the air — to a 20-foot-tall (6 metre) hopper, which discharges into a 40-ton (36 metric tonne) haul truck. The truck drives the material the short distance to the adjacent industrial park, where it is stored for further transport.

*The unit features a 200-foot reach, 359° oscillation and 50° vertical adjustment angle.*



“The most dust was produced when the substance was dropped into the hopper, and although it has a bag house attached, a percentage would still escape,” explained Stephen Kelly, Vice President of Sales and Business Development at the Port of Coeymans. “We realized that we also needed dust suppression for scrap metal storage and other operations in the industrial park. Our goal was to improve air quality for the safety of our employees and the surrounding community.”

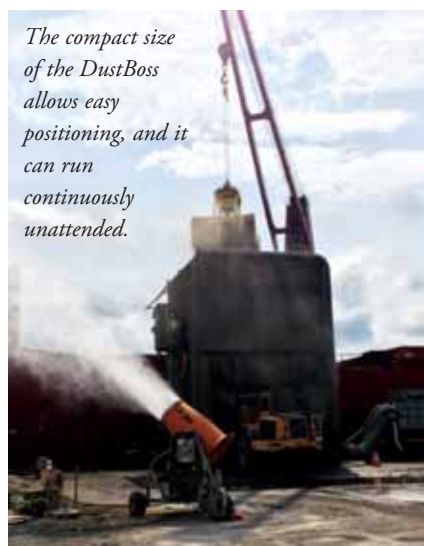
The 300-foot (91.4m) wide dock receives vessels of up to 750 feet (228.6m) in length overall (LOA). With no beam restrictions, it accepts ships with a draught (depth) of 31 feet (9.4m). In addition, a 300ft (91.4m) by 60ft (18.3m) inlet channel with a 15ft (4.5m) draught allows loading/unloading from both sides.

Like many other facilities handling bulk materials, the Port of Coeymans limits fugitive dust emissions by employing a couple of simple methods. One is limiting the distance the dust-emitting cargo travels from the ship's hold to the dock. This is done by using a clamshell shovel suspended from a crane to slowly unload the material

“The most dust was produced when the substance was dropped into the hopper, and although it has a bag house attached, a percentage would still escape,” explained Stephen Kelly, Vice President of Sales and Business Development at the Port of Coeymans. “We realized that we also needed dust suppression for scrap metal storage and other operations in the industrial park. Our goal was to improve air quality for the safety of our employees and the surrounding community.”

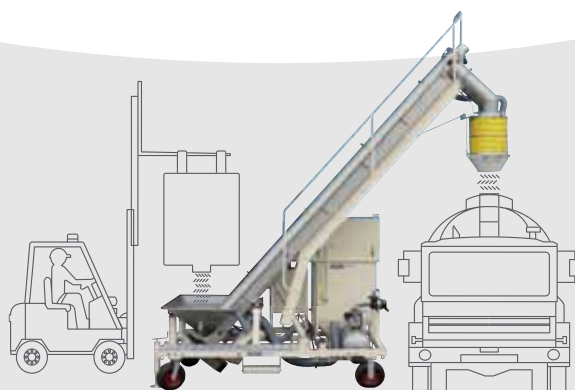


*The mist can be seen stretching across the deck to deliver efficient dust suppression.*



*The compact size of the DustBoss allows easy positioning, and it can run continuously unattended.*

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*Mounted on a tower, the DB-60 suppresses dust over metal scrap recycling piles.*

into a tall portable hopper with a baghouse dust collection system.

To further mitigate dust, crane operators reduce the amount of material collected by the shovel. Although this extends the unloading time, it curbs the amount of material escaping from the top or sides of the shovel and thus further limits dust emissions.

Another area that needed dust suppression was in the industrial park. Located about 700ft (213m) inland from the Hudson River with no natural wind barrier, the surface is a combination of concrete, packed earth and gravel. Scrap metal from various sources (demolition projects, old cars, dismantled ships, etc.) is transferred from barges and deposited into storage piles. During windy conditions, the unprocessed metal can emit dust both during offloading from vessels and loading onto ground transport.

The industrial park also stores mounds of various raw commodities. These well-organized piles, stretching as high as 20ft (6m), are exposed to outdoor conditions and can emit dust in moderate winds, during offloading by haulers, disruption by front loaders and loading into trains or trucks. Additionally, this heavy ground equipment can kick up its own dust during normal operations.

Kelly contacted BossTek, manufacturer of the DustBoss series of industrial atomized mist cannons and decided to rent two of the mid-sized DB-60 units to test them out. Mounted on a heavy-duty wheeled carriage with a pintle hitch, the DB-60 has a specially designed barrel with a powerful fan on the back end and a circular manifold with 30 atomizing spray nozzles on the front. The fan forces air through the cannon and past the manifold, launching millions of tiny atomized mist droplets 50 to 200 microns in size.

By introducing droplets roughly the same size as the dust particles, the droplets are able to travel with the particles, collide with them and drag them to the ground before they drift onto the dock area or across the site line.

A 25 HP fan producing 30,000 CFM



*Dust suppression is directed where it is needed most in the unloading process.*

(849.50 CMM) of air flow propels the engineered mist in a 200ft (60m)-long cone that reaches high over the deck of the ship. This type of coverage offers simultaneous surface suppression to material in the cargo hold and airborne suppression through the shovel's path from the hold to the hopper.

Approximately the height and length of a standard golf cart and weighing around 1,800 lbs. (816kg), the unit is easily moved on its wheeled carriage by a pickup truck or fork lift from the port to the industrial park. There, operators can cover more than 125,000 square feet (11,613 square metres) of the storage and traffic area using the 359° degree oscillation. The Port of Coeymans uses municipal water through a hose with a cam-and-groove quick disconnect coupling leading to a booster pump that raises the pressure up to 160PSI (11.03BAR), with a maximum of 250PSI (17.23BAR). The unit only requires a constant supply pressure of 10PSI (0.069BAR), and when a non-potable water source is used the DB-60 can be equipped with an in-line 30 mesh, 595-micron filter system.

There are some clear benefits over the use of hoses, which are required to be manned and can use up to 100gpm (378 lpm). The DB-60 uses far less water

(only 26.7gpm /101.1 lpm), delivering a much larger coverage area and requiring no labor for ongoing operation. Workers at the port simply place it in the desired location, point it in the right direction, hook up the hose and power, turn it on and walk away.

## RESULT

Operators report that air quality at the port has significantly improved during the unloading of clinker and other dusty materials, and that fugitive dust emissions have not been seen leaving the site since adding the units to the facility's dust management plan.

The cannons are easily positioned on the dock, taking up little room and covering a large area, allowing crane operators to transfer material from hold to hopper more efficiently. The industrial park has experienced a noticeable improvement in air quality, especially when a DB-60 is in operation during dry and windy periods.

"We are very happy with how the DustBoss controls the dust, how heavy-duty it is and how it works every time we turn it on," Kelly concluded. "BossTek has been very responsive and great to work with. I would recommend their atomized mist machines to any of my colleagues."

BossTek is a globally renowned provider of dust and odour control solutions for the storage and handling of clinker, petcoke, coal, rock and aggregate, as well as controlling air quality during port unloading, recycling and scrap processing, mining, earth moving and construction demolition. The company's DustBoss product line utilizes atomized mist technology propelled by powerful fans to capture fugitive particles over a wide area.



*The DB-60 combines a specially designed ducted fan with an atomized misting ring to deliver wide coverage.*



## AAF International unveils new products to combat dust



The FabriPulse® EV is a continuous-duty, versatile dry dust collector.

### FABRIPULSE® EV

The FabriPulse® EV is a continuous-duty, versatile dry dust collector designed to handle the most difficult product recovery applications and can be used as an integral part in the following applications: belt conveyers, hoppers, mixers, pneumatic conveyers, silo venting and truck discharges. The design of the FabriPulse® EV allows maximum airflow and efficiency and is available in various sizes with filtration areas ranging from 4m<sup>2</sup> to 80m<sup>2</sup> and can handle airflow volumes from 400m<sup>3</sup>/h to 10,000m<sup>3</sup>/h. Engineered to give years of efficient service and minimum downtime, the FabriPulse® EV has an intelligent modular design that reduces freight and installation costs. Requiring a minimal space envelope, it is easy to install and service and meets the stringent efficiency requirements mandated by today's environmental regulations.

### OptiFlo® RC SPK

The OptiFlo® RC cartridge collector, now with an integral spark trap to extinguish sparks, is an ideal way to remove contaminants and fumes from metalworking applications such as; laser cutting, plasma cutting, shot blasting, metalizing and welding. It is available in five sizes; the smallest handling air volumes of 1,000–4,000m<sup>3</sup>/h to the largest unit handling air volumes of 12,000–16,000m<sup>3</sup>/h.

The OptiFlo® RC SPK can deliver superb air cleaning and extended filter life using REDClean® Media Technology. AAF REDClean® Media has been developed specifically to withstand the rigours of pulse cleaning with superior dust release, and outperforms all standard media.

The OptiFlo® and REDClean® combination is designed to maximize filtration efficiency, extend filtration life, reduce operational pressure drop and lower

The OptiFlo® MP is a compact dry dust collector ideal for venting small volumes of dust laden air.



compressed air consumption. This results in a great reduction to the overall life cycle cost, maximizing return on investment and reducing the cost of plant ownership.

### OptiFlo® MP

The OptiFlo® MP is a compact dry dust collector ideal for venting small volumes of dust laden air and can deliver superb air cleaning and extended filter life using REDClean® Media Technology. It is the optimum solution for a variety of air quality problems and can be used as an integral part of processes in a vast range of industries such as; materials handling, powder processing, chemical, plastics, food and pharmaceutical.

The OptiFlo® MP is available in two sizes, 2.2m<sup>2</sup> and 4.4m<sup>2</sup> filtration areas, in a standard venting unit or as a fan-assisted version. The venting unit can handle air volumes from 100 - 800m<sup>3</sup> per hour and the fan unit is rated up to 225m<sup>3</sup> per hour @150mm WG.

The FabriPulse® EV, OptiFlo® RC SPK and OptiFlo® MP were designed with original equipment manufacturers (OEM) in mind. AAF offers customizable branding options and volume guarantees.



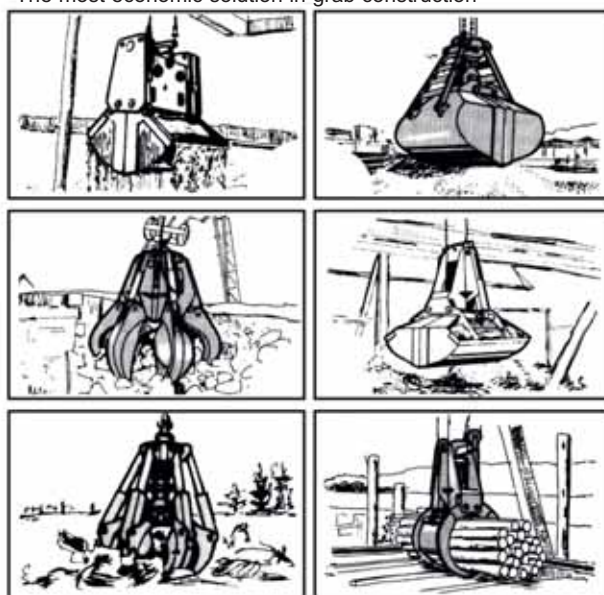
### ABOUT AAF

AAF International, based in Louisville, Kentucky, has more than 5,400 employees, 22 manufacturing facilities, and 6 R&D centers worldwide. AAF designs, develops, and manufactures air filtration solutions for commercial, residential, industrial, cleanroom, transportation, and nuclear power applications. AAF also provides inlet air cooling and sound attenuation solutions for high-speed rotating machinery.

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## Dust control for free flowing material

A vital addition for ports, grain processing or mineral and chemical industries where dust control is an important part of materials handling is the patented dust suppression hopper now available from T H WHITE Projects.

A major challenge in the commercial handling of powdery, granular or other free-flowing materials has always been dust control. Depending on the material being handled, dust may not just be unpleasant and unsightly — it can cause health issues, environmental hazards and even the risk of explosion.

Many processing, storage and handling plants may think they have little choice other than to try and cope with a dust-polluted atmosphere, but this Dust Suppression Hopper solution distributed throughout England and Wales by T H WHITE Projects virtually eliminates dust during transfer processes. Manufactured in New Zealand by DSH Systems Ltd, the Dust Suppression Hopper is an easily-installed loading spout, designed to be mounted immediately beneath an existing feed point. It's ideal for use where free-flowing products need to be packed, bagged, or loaded into ships, railway wagons, trucks, silos or storage bins.

Simple in design, yet highly effective, the dust suppression hopper funnels material through a restricted orifice and cone, causing it to adopt a swirl. As the material exits the nozzle a combination of surface tension, compression and the induced vortex holds it together in a tight, highly controlled stream which contains any dust within the column.

The standard version has no internal moving parts and requires no power — it is simply configured before use according to the type of material being dealt with. Where several different types of material may need to be out-loaded from the same conveying system there is an advanced model featuring a computerized positional feed control.

Both models are available in a range of 10 sizes and can be made from standard polyethylene, or tougher materials including steel (mild steel, electro-galvanized, Corten or Hardox) where aggressive or abrasive materials are being handled. 304-grade stainless steel can also be specified for the handling of warm or abrasive materials, and 316-grade stainless steel for food grade handling and corrosive materials.

Inspired by the need for safer handling of fertilizers, the design of the dust



suppression hopper has proved to be equally effective when handling most other free-flowing granular materials. Goods which are already being widely handled with success include cereals, sugar, salt, pet foods, sand, gravel, limes, minerals, pellets and chemical powders. Other dry goods can be trialled.

Applications for the dust suppression hopper are enormous. Across the grain processing industry its benefits can be applied at grain storage and handling installations including co-operatives, milling plants, maltings, breweries and distillers. Mineral and chemical plants including mines, quarries and glass works, can benefit from far tighter control of potentially hazardous materials. And at ports — where it's important to control dust drift while loading ships or transferring goods between ships and rail, road or storage facilities — the benefits are equally rewarding.

Containment of dust is a considerable benefit in providing a safer, healthier environment for the workforce, but it also minimizes wastage and increases the yield

of saleable product. Added to that it's likely to lead to savings in cleaning and maintenance — a fantastic pay-back for an initial small investment.

### ABOUT T H WHITE

The UK-based T H WHITE Projects team has been helping customers get the best from grain processing, storage solutions and plant for almost 40 years as specialists in industrial and farm grain storage. They now provide a huge array of grain services and bespoke steel fabrications across multiple sectors including ports, food and beverage, construction and agriculture, backed by high-class service and maintenance.

T H WHITE Projects are technical engineers whose focus is on service. This brings trust, experience and professionalism to every grain or fabrication project. Founded in 1832, T H WHITE Group is a family and staff owned, and supplies and maintains equipment in multiple sectors including groundcare, construction, lorry cranes, dairy and agriculture.

## Complete dust suppression system for bulk material handling

Martin Engineering has introduced a customizable dust control system that delivers application-specific components, controls and additives to significantly improve suppression vs. off-the-shelf products. The Martin® Surfactant Dust System is a turnkey solution comprised of modular elements that are configured to best suit the individual operating conditions and materials of each customer operation, with a broad array of options that includes customized spray, material sensors, programmable controls, surfactants and even remote monitoring. With a versatility not typically found in stock suppression methods, the new system is now offered alongside the firm's large family of other dust management products, giving customers a wider range of dust control and containment choices for improved effectiveness and efficiency.

"Every application is a one-off, so it stands to reason that the solutions should also be unique," observed Martin Engineering Dust Solutions Manager Mark Strelbel. "Our goal is to actually prevent



*Martin Engineering systems are designed to prevent dust at the source, using the optimum treatment method.*

dust at the source if possible, using the optimum treatment method in each case.

This approach allows us to offer a virtually unlimited combination of design options



### WE CARE ABOUT YOUR AIR!

Solve the world-wide industrial material handling problem – dust fallout while transferring dry, granular goods. At the loading point, the DSH System concentrates the discharge of dry goods as a solid column through free air into any target repository including trucks, rail wagons, storage containers, bags, ships, barges or stockpiles. The DSH Dust Suppression System uses no utilities and has no internal moving parts. Winner (joint) of the Inaugural Innovative Technology Award at BulkEx 2006. Winner of the Dust Control Technology "Application or Practice" at BulkEx 2007.

The DSH System gives you:

- Cleaner, safer working environments
- Dust explosion risk mitigation
- Reduced maintenance, cleaning and dust handling
- Faster, continuous, cleaner loading of trucks and rail wagons
- Enables operation in closer proximity to urban areas
- Reduced product shrinkage.
- Reduced environmental agency concerns

Clients include companies handling fertilizers, grains, stock-foods, salt, sugar, sand, etc in Australasia, USA, Canada, South Africa, South America, and Europe (East and West).



and accessories for maximum control.”

“Some applications can tolerate as much as 5% allowable moisture addition,” Strebel explained. “In those operations, spray bars can deliver plain water directly to the material for basic, economical dust control. In hazardous or explosive environments, a controlled fluid spray allows us to meter in additives and obtain the benefit of a residual effect,” he said. “In more sensitive applications, the limit may be 0.5% or less, and in those cases we can employ a specialized surfactant to minimize moisture addition and achieve effective dust management across a wide variety of materials and handling techniques.”

Strebel added that having this system as part of the company’s family of products puts Martin Engineering in a unique position to deliver the best solution for a given application, even if that means combining several technologies to work in concert with one another. “We are now able to address dust issues through prevention, containment, control or suppression,” he said. “Effective dust management is often not possible with just one approach, but the right combined solution will often deliver the end result at a reduced cost of ownership.”

Among the other available options, activation sensors can be used to manage the dust suppression system, dispensing the control agent only when material is present to reduce waste and cleanup. Automatic flow adjustment is also available to consistently deliver the appropriate amount of water and additives to reduce overspray and help control costs.

### AIR FILTRATION

When the bulk material cannot tolerate any added moisture, filtration may be the critical piece in the dust-management system. Mechanical air filtration systems are installed to pull dust-laden air away from its source, separate the dust from the air, and exhaust the cleaned air. Available in both passive and active designs, a passive system simply allows air to move through the filter medium, whereas active systems work like a vacuum cleaner to pull or push air through a filtration method to remove the particles.

The new Martin Engineering system can be configured to include passive elements such as dust bags to take advantage of positive air pressure for particle control without using any power. The bags self-clean by collapsing and depositing their contents back into the material stream whenever the air flow stops. Some containment is typically required, such as dust curtains or an enclosure.

The company also offers a family of insertable air cleaners, which are installed directly at transfer points and other dust-generating points to collect airborne particles without using large fans and ductwork. Designed to remove dust from the air in applications such as conveyor loading and transfer points, silo vents and bucket elevators, the self-cleaning filters feature an automatic pulse cleaning system, which uses a short burst of air sent back through the filter media to dislodge accumulated material and return it to the bulk flow.

Founded in 1944, Martin Engineering supplies flow aids and conveyor products around the world for a wide variety of bulk material applications, including mining, aggregate, coal, cement, biomass and other materials.

The firm is headquartered in Neponset, IL, offering manufacturing, sales and service from factory-owned business units in Brazil, China, France, Germany, India, Indonesia, Mexico, Peru, Russia, South Africa, Turkey and the UK, and under exclusive licence with ESS Australia.



*Controlled fluid sprays and specialized surfactants minimize moisture addition.*



*Application-specific components, controls and additives improve suppression vs. off-the-shelf products.*



*Insertable air cleaners filter dust-bearing air at the source, without the ductwork or large fans of central collection systems.*

## ADS™ Dry Fog dust control, by The Raring Corp

In our lives, we can find dust almost everywhere, in our homes, cars, yards and in many other places you can imagine, writes Gonzalo Campos Canessa, CEO, TRC.

There are different levels of dustiness which basically depends on two main factors: lack of moisture, and wind. When dirt is dry it is easier for the fine particles to become airborne, because it is difficult for them to stay together and to be heavier as a whole bulk. The second factor is how the dirt is exposed to wind. If the dirt is dry and exposed to wind, dust emissions will be seen.

In industrial facilities and specifically on the material handling side, we can see the same effect we see on our lives. In these facilities the effect is more dramatic than in our ordinary lives because the amount of dirt (ore, coal, chemical products, grains, wood by-products and others) being moved is massive. They can contain components dangerous to the health of human beings and most industries are located in isolated place where the winds are heavier, and it is always difficult to protect the dirt from the winds.

Dust control is a combination of two elements, passive and active. The active dust control systems are those that use energy to operate, there are several options and suppliers who can take care of this important part, which can be done by dust suppression, extraction or scrubbing. Regarding the passive dust control system, we can say that it is as important as the active one, and they cannot work apart. The passive dust control system is the key element that creates a controlled volume to isolate the point where dust is generated allowing the active one to do its job.

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

There is a huge difference between the two technologies that we offer to our clients for controlling the dust on industrial facilities, ADS™ Dry Fog is intended to control the dust where it is generated and WSS is an accumulative process which increases material's moisture in order to reduce its capacity to generate dust downstream.

ADS™ Dry Fog technology applies to



*ADS™ Dry Fog uses The Raring Corp's special acoustic nozzles to fracture water into a cloud of extremely small droplets that are in the same size range as the airborne respirable dust.*

crushing, screening, conveying, loading, and unloading of dry bulk materials. When done properly, it is as effective as dust extraction with bag houses and much less expensive to implement, operate, and maintain. ADS™ Dry Fog uses The Raring Corp's special acoustic nozzles to fracture water into a cloud of extremely small droplets that are in the same size range as the airborne respirable dust. These devices use compressed air to create high frequency sound waves that shatter water into the fog sized droplets needed while retaining adequate kinetic energy to project the fog where it's needed and penetrate through opposing air flows. The nozzles incorporate relatively large liquid ports which act along with the acoustic nature of the nozzles to resist plugging. Acting in the same way that clouds cleanse the atmosphere of dust, the water droplets agglomerate with the dust particles, become heavier, and settle back to their source. Successful application of ADS™ Dry Fog technology to industrial dust control requires three design elements on top of fog application: containment, retention time, and collection surface. As it was mentioned previously on this article, containment (passive) is the most important one. Transfer enclosures need to be a little larger than the norm, truck and rail dumps require features to contain the displaced air by rolling it back into the hopper, and bins need protection from wind and other outside influences.

There are many ways to control dust in dry bulk material handling applications and all have their place. ADS™ Dry Fog is particularly well suited to most containable dust sources; it's sometimes the only

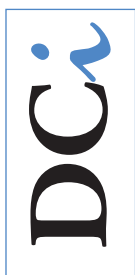
choice that has a chance of success, and it sometimes cannot be used. In most plants, a well-thought-out combination of technologies is the best solution.

Going back to the size of the water particles: if the water and dust particles differ greatly in size, the slipstream created by the larger one carries the smaller one around it and impact is prevented. This simple principle explains why plain Water Spray Systems are not a good solution for controlling the dust at the source: material is fine and water don't get together and we are just wetting the first layer of the material. At TRC we do use plain Water Spray Systems and sometimes together with the ADS™ Dry Fog, in order to give our clients overall solutions for their problems. Nevertheless, what TRC is looking to achieve by using Water Spray Systems is getting the bulk material moisture close to its DEM factor. The DEM factor (Dust Extinction Moisture) is the moisture-level where the material stops generating dust and at TRC we design our WSS to make a step-by-step process to create a homogeneous material in terms of moisture. This way, we force the material to start gradually losing its capacity to generate dust and when it finally reaches the stockpile the dust generation is minimized.

After a great deal of experience working on dust control, we can say that these technologies required both technical knowledge and experience to be used and implemented properly, but when we get to apply them together good dust control systems can be implemented which contributes to the environment and to the a health of the people directly involved. DCi

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