



DRY CARGO

international

ISSUE NO. 208 NOVEMBER 2017



FEATURES

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VIGAN Engineering S.A.
Rue de l'Industrie, 16
BE – 1400 Nivelles
Belgium
T: + 32 67 89 50 41
F: + 32 67 89 50 60
E: info@vigan.com
W: www.vigan.com



PUBLISHERS

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

EDITORIAL

Louise Dodds-Ely Editor
louise@dc-int.com
Jay Venter Deputy Editor
editorial@dc-int.com
Samantha Smith Directories
directories@dc-int.com
Stephanie Hodgkins Office Manager
accounts@dc-int.com

SALES

Matthew Currin Senior Sales
sales2@dc-int.com Executive
Gregg Franz Advertisement Sales
sales@dc-int.com Executive

CORRESPONDENTS

Brazil **Patrick Knight**
India **Kunal Bose**
Asia **David Hayes**
Europe **Barry Cross**
Malaysia **Wira Sulaiman**
Philippines **Fred Pundol**
South Africa **Iain McIntosh**
UK **Maria Cappuccio**
UK **Michael King**
UK **Richard Scott**
USA **Colby Haines**
USA **Walter Mitchell**

ADMINISTRATIVE OFFICE

Business Publishing International
Corporate Park, 11 Sinembe Crescent
La Lucia Ridge, South Africa, 4051
Tel: +27 31 583 4360
Fax: +27 31 566 4502
Email: info@dc-int.com
Twitter: twitter.com/drycargomag

HEAD OFFICE

Trade Publishing International Limited
Clover House, 24 Drury Road,
Colchester, Essex CO2 7UX, UK
Tel: +44 (0)1206 562560
Fax: +44 (0)1206 562566
Email: info@dc-int.com
Website: www.dc-int.com
Twitter: twitter.com/drycargomag
ISSN 1466-3643






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NOVEMBER 2017 issue

featuring...



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Firmer support for coal trade

Further signs of strengthening support for commodity imports into many countries emerged during recent weeks. While uncertainty about how some elements will evolve in the months ahead is still justified, prospects for world seaborne dry bulk trade through 2018 are looking quite positive.

Underpinning a cautiously optimistic view of trade is the broadly encouraging outlook for global economic activity. Updated IMF forecasts published a few weeks ago indicated that in 2018 overall world GDP growth may continue improving to 3.7%, from 3.6% this year and 3.2% last year, despite an expectation of renewed slowing in China. Solid growth in the European Union, Japan and USA is expected to contribute to the future advance.

COAL

Some of the negative sentiment surrounding global coal trade has been reduced by evidence of resumed expansion. In particular, additional import demand in a number of Asian countries is clearly visible (see table 1), and there are tentative indications suggesting that the steep decline in EU imports has ceased, at least temporarily.

However, some forecasters remain highly cautious about future coal trade evolution. Estimates published by Australia's Dept of Industry, Innovation and Science last month showed world metallurgical coal trade falling by 10% in 2018, after a 20% jump to 377mt

(million tonnes) this year. In the much bigger thermal coal trade category, only a marginal 1% increase to 1058mt is estimated in 2017, followed by a 2% decline in the following twelve months.

IRON ORE

Buoyant steel demand around the world is benefiting production at mills in numerous countries, with advantages for seaborne raw materials movements. According to World Steel Association figures, China's crude steel production was 6% higher in the first nine months of 2017, compared with last year's same period, at 639mt. In the EU and South Korea, 3-4% increases to 126.4mt and 52.8mt respectively were seen, but Japan's volume remained almost flat at 78.3mt.

A new forecast of steel demand, which the WSA published recently, suggests that the higher levels estimated for this year could be broadly maintained in 2018. In China and Korea unchanged or almost unchanged demand for steel is envisaged during the next twelve months, while Japan and the EU could see marginal 1% rises.

GRAIN

Lower wheat and barley imports into China, and lower wheat imports into India, are likely to be features of global grain trade during the current 2017/18 crop year ending June 2018. Excessive grain stocks in China, and a better domestic harvest in India are having negative effects on foreign buying.

Elsewhere among grain importers, signs of rising imports are prominent. As a result, the International Grains Council predicts that world trade in wheat and coarse grains could increase by 7mt or 2% in 2017/18, reaching 359mt. Larger volumes imported by South Korea, Iran, Saudi Arabia, Mexico and European Union countries probably will more than offset the reductions envisaged.

MINOR BULKS

Agricultural and related minor bulk cargoes, as a group, appear to be resuming growth this year. Although lower sugar movements are estimated, additional oilseed/meal and cereals quantities could raise agricultural minor bulk trade to over 230mt. Movements of urea, potash and phosphate could also increase, raising seaborne fertilizer trade to around 160mt, according to some estimates.

BULK CARRIER FLEET

The Capesize (100,000dwt and over) bulk carrier segment comprises about two-fifths of the entire world fleet of bulk carriers. As shown in table 2, growth in Capesize deadweight capacity is likely to be faster in 2017 than seen last year despite lower newbuilding deliveries, because scrapping has fallen sharply amid improved freight market rates.

A limited newbuilding delivery schedule for next year suggests that a fleet slowdown may resume.

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

	2012	2013	2014	2015	2016	2017*
Japan	113.7	114.5	114.2	120.1	115.8	118.0
South Korea	98.9	100.1	100.8	102.6	102.5	111.0
Taiwan	55.2	57.1	57.0	56.3	55.0	59.0
China	181.5	192.0	165.5	107.9	124.2	135.0
India	123.4	144.1	176.0	171.0	146.3	139.0
Total of above	572.7	607.8	613.5	557.9	543.8	562.0

source: various & BSA estimates

*BSA forecast

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

	2012	2013	2014	2015	2016	2017*
Newbuilding deliveries	41.9	22.0	18.5	16.9	20.0	16.0
Scrapping (sales)	11.7	7.9	4.2	15.4	13.3	6.0
Losses	0.0	0.2	0.0	0.0	0.2	0.3
Plus/minus adjustments	-0.2	0.1	0.0	-0.4	-0.5	0.0
Fleet at end of year	279.8	293.8	308.1	309.2	315.2	324.9
% change from previous year-end	+12.0	+5.0	+4.9	+0.4	+1.9	+3.1

source: Clarksons (historical data) & BSA 2017 forecasts

*BSA forecast

by Richard Scott, Bulk Shipping Analysis, Tel: +44 (0)12 7722 5784; Fax: +44 (0)12 7722 5784; e-mail: bulkshipan@aol.com



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Fertilizer outlook



AMECO ET scraper for urea installed at Engro Fertilizers in Daharki, Pakistan.

Maria Cappuccio

The International Monetary Fund (IMF) confirmed the upswing in economic activity is strengthening, with global growth projected to rise to 3.7% in 2018. Broad-based upward revisions are noted for the euro area, Japan, emerging countries in Asia, Europe and in Russia that more than offset downward revisions for the US and the UK. But in many countries growth remains weak and inflation below target in most advanced economies. Commodity exporters, especially of fuel, have been hard hit due to the sharp reduction in foreign earnings. For policymakers, the welcome cyclical pick-up in global activity provides a window of opportunity to tackle key challenges, to boost output ensuring the benefits are more broadly shared and to build resilience against potential risks.

NEAR-RECORD HARVEST BOOSTS GRAIN AND OILSEED SUPPLIES

Global production of cereals, coarse grains and oilseeds, is on track to produce a near

record global harvest of 3.1bn/t in 2017. Wheat production is forecast at 751mt (million tonnes) with notable crops in Russia, Kazakhstan and Ukraine, with coarse grains lower at 1,319mt and a larger oilseed output at 577mt.

Global wheat consumption is largely unchanged from last season while much of the rise in corn consumption is in China, where government measures are in place to stimulate demand in order to reduce corn stocks. The global wheat stocks-to-use ratio is forecast at a record 36%. By contrast global corn stocks are anticipated to fall for the first time in five years due to a smaller harvest and increased use. Agriculture prices are expected to edge up in 2018 due to reduced supplies, with grain, oil and meal prices rising marginally.

FAO FOCUS ON THE ROOT CAUSES OF MIGRATION

The UN's Food and Agricultural Organization (FAO) chose the theme for World

Food Day 2017, 'Change the future of migration. Invest in food security and rural development' to encourage the international community to respond to the root causes of migration—namely, poverty, food insecurity, inequality, unemployment and lack of social protection as more people migrate because they do not have the option to stay in their homes and on their lands.

The FAO's Director General José Graziano da Silva said, "In 2015 there were more than 240m international migrants in the world, 40% more than in 2000. The number of internal migrants who stay within their own countries and regions, mainly moving from rural to urban areas, has already passed 740m, unprecedented in the history of mankind." Investing in food security and rural development, can harness migration's potential to support development, laying the foundation for long-term recovery and inclusive sustainable growth.



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MODEST INCREASE IN FERTILIZER DEMAND BY 2021

Against the backdrop of well supplied agricultural markets, the International Fertilizer Association (IFA) forecast a modest increase in fertilizer demand in 2017/18 to 188mt. Longer-term, relatively flat prices for a number of agricultural commodities reflect prospects for ample supplies and weaker growth, resulting in a modest increase in fertilizer demand to 199mt in 2021/22. Potash demand is expected to grow firmly by over 2.1%, phosphate 1.5% and nitrogen 1.2% each year.

CHALLENGING ENVIRONMENT FOR THE FERTILIZER SECTOR IN 2017

While operating within a more stringent and regulatory environment, the combination of uneven global nutrient demand, soft economic prospects, depressed crop prices, rising market competition and volatile energy prices created high uncertainty in fertilizer markets throughout the year. IFA's Director General, Charlotte Hebebrand, drew attention to the significant new capacity additions, driven by investment decisions made four to eight

GLOBAL FERTILIZER USE

Year	1961–2021/22 mt nutrients			
	Nitrogen	Phosphate	Potash	Total
1961/2	11.6	10.9	8.7	31.2
1970/1	31.8	21.1	16.4	69.3
1980/1	60.8	31.7	24.2	116.7
1990/1	77.6	36.0	24.6	137.8
2000/1	81.2	32.5	21.9	135.6
2001/2	82.9	33.4	23.0	139.3
2002/3	85.1	34.1	24.7	143.9
2003/4	87.1	35.2	25.5	147.8
2004/5	90.2	37.5	25.6	154.7
2005/6	93.2	37.0	26.3	156.5
2006/7	97.4	38.1	26.9	162.4
2007/8	100.5	38.4	28.9	167.9
2008/9	97.7	33.7	23.4	154.8
2009/10	102.2	37.6	23.7	163.5
2010/11	104.1	40.6	27.5	172.3
2011/12	107.9	41.4	28.0	177.2
2012/13	108.6	41.4	29.2	179.1
2013/14	109.9	40.5	30.4	180.7
2014/15e	110.3	41.1	32.0	183.4
2015/16	108.0	41.0	32.0	181.0
2016/17	111.0	42.0	33.0	186.0
2017/18	112.3	44.1	33.7	188.0
2021/22	112.0	48.0	38.0	198.0

Source:FAO, IFA

FERTILIZER PRICES \$ PER TONNE FOB 2009–2015

	2017	2016	2015	2014	2013
	Oct Wk2	Oct Wk2	Oct Wk2	Oct Wk2	Oct Wk2
	\$	\$	\$	\$	\$
	2017	2016	2015	2014	2013
Urea					
Baltic	270	201	259	310	273
Persian Gulf	215–275	—	—	—	—
US Gulf	265	201	—	—	—
Ammonia					
Yuzhny	210–215	189	248	—	410
Tampa CFR					
Middle East	245	220			
	440	650	490		
Ammonium sulphate					
FSU	—	—			—
Asia	—	114	142		
Di-ammonium phosphate					
North Africa	360–365			—	
US Gulf	345	306	460	464	373
China	360	—	—	—	—
Baltic					
Triple Super phosphate					
North Africa	—		380	—	—
US Gulf	—	277			
Muriate of potash					
Baltic	—	221	—	—	—
Vancouver	—	215	300	310	345
US Gulf	220–228	—	—	—	—

Source: Bloomberg, FarmFutures, Fertilizer Week, Fertilizer Market Bulletin, Profercyll¹ Monthly average—Sept

years ago, especially for nitrogen and potash that will exacerbate supply/demand imbalances notably in 2017–2018, no improvement is expected before 2019, with supply to remain abundant, up to 2021.

MERGERS RESHAPE GLOBAL CHEMICAL AND SEED MARKETS

Dow Chemical and DuPont successfully completed their planned \$130bn merger to form DowDuPont (DWDPP), a holding company, in September this year. Post-merger, DWDPP intends to split within the next 18 months, into three independent publically traded companies, agriculture, specialty products and materials science. ChemChina's \$43bn takeover of Syngenta, also received the green light, although legal claims against Syngenta arising from the sale of genetically modified corn in 2013 and how the claims will be settled, led to downgrades by ratings agencies S&P and Fitch. Potash Corp and Agrium are expected to complete the U\$36bn merger by the end of the year. Once merged, the new company will be called Nutrien, with the head office in Saskatoon, Canada, bringing together PotashCorp's huge network of fertilizer mines with Agrium's global direct-to-farmer retail network.

Meanwhile the proposed Bayer AG and Monsanto U\$66Bn merger faces scrutiny by the EU antitrust regulators, amid concerns that such a merger may reduce



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Sede Operativa - Working Headquarters

Via Sigalina a Mattina, 12/14
25018 - Montichiari - (BS) - Italy

Mobile: (+39) 340 1358822 **Foreign office:** (+44) 7978302839
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CEREALS AND OILSEEDS – PRODUCTION, USE & STOCKS 2016–2017/18 MT

	Prod 16/17	Prod 17/18	Use 16/17	Use 17/18	Stocks 16/17	Stocks 17/18
Wheat	754	751	739	740	257	268
Coarse grains	1367	1319	1356	1352	262	229
Rice	487	484	481	481	138	142
Total Cereals	2608	2554	2576	2573	657	639
Oilseeds	573	577	469*	488*	107	108

Source: USDA—mainly harvested Jul-Dec/ *oilseed meal/oil consumption

competition for pesticides, seeds and plant traits. The deal — one of several in the agricultural chemical and seed markets — comes amid fears that bigger, more powerful suppliers would be better placed to push-up prices while cutting back on the development of new herbicides and pesticides.

GOOD DEMAND AND CHINESE SHUTDOWNS UNDERPIN FIRM PRICES

Prices of nitrogen have soared 60% in the US, with similar hikes in Brazil, India and the Middle East, the move higher could continue into November with good demand in South America and India, despite a significant global surplus, new capacity and a bumper harvest, to pressure already weak grain prices. Better weather in the US, after a slow start to harvest and winter wheat seeding, could also stimulate some demand. US spot prices for urea, climbed to an 18-month high, supported by the demand from India for a greater quantity than the market had anticipated coupled with a sharp fall in Chinese urea exports, which fell by 600,000/t in July and August and by 45% to 5.4mt for the year to August, due to the rising cost of coal and the government's anti-pollution campaign.

Hurricanes *Harvey* and *Irma* caused disruption to US shipments, making it more difficult for companies like Mosaic and CF Industries. Benchmark contract price for ammonia for October at the port of Tampa, Florida, rose to \$245/t, up \$30 month-on-month and potash prices edged up 0.5%. Partly offsetting gains phosphate rock prices dropped 8% as new capacity added to oversupply, and DAP prices fell back on weak demand and oversupply. Fertilizer markets continue to face relatively weak global demand due to low crop prices. Markets remain well supplied with adequate stocks and growing low-cost capacity. Fertilizer prices are expected to strengthen by 3% in 2018 on moderate demand growth, although growing low-cost capacity, expected to weigh on prices.

WHEAT PRESSURED BY BURGEONING STOCKS

The 2017 wheat harvest forecast at 751mt, the second largest crop on record, will increase global stocks for the fifth consecutive year to a record 268mt (China 127mt). For coarse grains the harvest at 1,319mt is lower and with demand similar to last year, global coarse grain stocks are expected to decline for the first time in five years. Wheat futures remain under significant pressure, CBOT Dec Contract for wheat closed down at \$4.246/bu (Oct 30). fob offers for Russian wheat have risen to \$195/t, US Hard Red Winter Wheat \$217/t/Soft Red Winter Wheat \$190/t, French Grade 1 Rouen \$191/t (Oct 30).

GLOBAL WHEAT AREA PROJECTED LOWER IN 2018

Winter wheat plantings for the 2018 underway in the northern hemisphere, too much rain, or too little, delayed winter grain sowings in some areas. The International Grains Council, projects the wheat area, on a harvested basis for 2018, to be fractionally lower year-on-year. Russia is expected to expand the wheat area and in the EU the wheat area is expected to be

broadly similar. Dry conditions hampered US wheat seeding nevertheless, most, but not all, analysts support lower US wheat plantings, due to poor economic and price relationships for winter and spring wheat varieties, compared with sorghum and corn. China cut its minimum purchase price for wheat by 2.5% for 2018 to 2,300 yuan (\$346/t) well above world prices.

PLANTINGS HAMPERED BY INSUFFICIENT RAIN IN MATO GROSSO

Soybean plantings across Brazil are mixed. In southern Brazil, rains accelerate planting, while the central-west region is suffering from irregular rainfall that threatens to damage the second corn crop. Paraná, a large producer of soybeans, has planted 53% of the area, while in Mato Grosso, the main soybean-producing state, irregular and insufficient rainfall, caused serious delays, with only 27% of sowings complete. USDA's provisional estimate for Brazil's soybean output is forecast at 107mt in 2017/18.

CORN OUTPUT TO FALL IN BRAZIL

Following the bumper corn harvest last year Brazil' corn production is expected to be lower at 95mt in 2017/18. Dr Michael Cordonnier Soybean & Corn Advisor, Inc. believes that the combination of reduced acreage and weather concerns in key states will cut production. Heavy storms, high winds, huge hail stones have caused serious delays in Rio Grande do Sul, while continuing dry weather delayed corn plantings in Minas Gerais and Parana where corn acreage is expected to fall by 31%.

CEREAL EXPORT PRICES US \$ FOB PER TONNE 2013-2017

	2017 Oct Wk2 \$	2016 Oct Wk2 \$	2015 Oct Wk2 \$	2014 Oct Wk2 \$	2013 Oct Wk2 \$
Wheat No 2 HRW	217	194	221	289	327
Corn No 3 Yellow (Gulf)	157	163	175	184	211
Sorghum (Nola)	191	175	198	229	233
Soybean No 2 (Gulf)	375	378	369	410	515
Brazil					
Soybean					
Argentina (up river)	386	411	—	—	—
Wheat	—	—	223*	248*	—
Corn	148	174	161*	166*	—
Soybean	372	381	360	414	527
Thailand					
Rice White 5% broken	383	350	375	435	—
Vietnam					
Rice White 5% broken	400	331	—	—	—
India					
Rice White 25% broken	366	331	—	—	—

Source: FAO IGC USDA — *Monthly average — Sept; rice prices based on indicative quotes.

**GLOBAL NITROGEN SUPPLY/DEMAND
2016–2021/22 MT N**

Fertilizer	2016	2017	2021
Nitrogen capacity	181.2	185.2	—
Nitrogen supply*	158.8	166.4	—
Nitrogen demand	146.0	147.6	150
Fertilizer use	111.5	112.3	112
Other	34.5	35.3	38
Nitrogen balance	12.8	18.8	—

Source: FAO/ IFA-data N/t basis * effective capacity derived by capacity x by the highest achievable operating rate

**GLOBAL POTASH SUPPLY/DEMAND
2016–2021/22 MT K₂O**

Fertilizer	2016	2017	2018	2019	2020	2021
Potash capacity	55.9	58.1	61.6	62.1	64.5	65.5
Potash supply	44.2	45.9	47.9	49.7	51.7	53.3
Potash demand	37.2	39.3	41.6	43.2	43.7	45.6
Fertilizer	33.1	34.0	34.9	35.9	37.0	38.0
Potash balance	7.0	6.6	6.3	6.5	8.0	7.7

Source: IFA-Data K20/t basis

Lower corn prices may encourage farmers to switch to soybeans, other small grains or to cover crops. Conab estimated Brazil's cotton acreage to rise by 5-15% in 2017/18.

ARGENTINE FARMERS TO PLANT MORE CORN

Large soya stocks, low domestic prices and high export taxes are expected to encourage Argentine farmers to increase corn acreage. USDA forecast Argentina's corn crop at 42mt in 2017/18. But, growing conditions are less than ideal, as parts of Argentina experienced excessive rainfall, saturating up to 4–6m/ha of the most productive farmland.

US CORN ACRES TO RISE IN 2018

Pat Westhoff head of the University of Missouri's Food and Agricultural Policy Research Institute (FAPRI) acknowledged that while much can change in the US market before the final 2018 planting decisions are made next spring, an improved outlook for corn returns relative to those for soybeans in recent weeks may support a rise in corn acreage to 93.2m/acres a gain of 2.3m/acres in 2018. FAPRI's estimate is based on recent futures prices, lend support to corn over soybeans, lower fertilizer prices and crop rotation patterns that also favour corn; while, this year's record US soybean crop will result in season-average price of \$9.07/bu, 40¢ below the 2016 crop's average, likely to further increase the bias towards corn.

The global corn crop is forecast at 1,039mt in 2017, and includes a huge US

corn crop of 363mt

currently being harvested with farmers in some key states well behind the pace. Despite large supplies markets rallied on firm US export sales data, CBOT Corn Futures Dec '17 closed up at \$3.48/bu (Oct 27 '17). Corn 3YC FOB US Gulf \$157/t (Oct 27 '17).

NITROGEN CAPACITY EXPANDS DESPITE CHRONIC OVERSUPPLY

North America saw an excess capacity of nitrogen in the recent quarters including imports from China. The excess supply put downward pressure on nitrogen prices in North America, and affecting producers including CF Industries, Terra Nitrogen, PotashCorp and CVR Partners.

Yara, the world's biggest nitrogen fertilizer producer, unveiled a 13.6% drop in earnings to NOK709m for the July-to-September quarter, on revenues flat at NOK23.8bn. The drop in earnings, reflected a weaker dollar and a rise in costs of energy, expected to continue showing into next year. Yara's President and CEO Svein Tore Holsether acknowledged that results could have been worse without the boost to urea prices from Chinese shutdowns and supportive farm margins. He confirmed that despite the uptick in prices towards the end of the quarter, the market remains essentially fundamentally supply-driven.

Global ammonia capacity to rise to

**GLOBAL UREA SUPPLY/DEMAND
2016–2021/22 MT UREA PRODUCT**

Fertilizer	2016	2017	2018	2019	2020	2021
Urea capacity	209.0	217.0	221.0	223.0	224.0	226.0
Urea supply	184.5	187.5	190.5	193.6	196.8	200.0
Urea demand (all uses)	173.4	176.0	178.7	181.4	184.2	187.0
Urea balance	11.1	11.5	11.8	12.2	12.6	13.0

Source: FAO/ IFA-Data mt Urea basis

Source: IFA—data M/t urea basis

**GLOBAL PHOSPHORIC ACID SUPPLY/DEMAND
2016–2021/22 MT P₂O₅**

Fertilizer	2016	2017	2018	2019	2020	2021
Phosphoric acid capacity	57.2	58.5	59.9	61.3	62.7	64.1
Phosphoric acid supply	46.9	48.0	49.1	50.2	51.4	52.5
Phosphoric acid demand	41.9	43.1	44.1	45.0	45.8	48.0
Fertilizer	38.4	39.5	40.5	41.3	42.1	44.3
Phosphoric acid balance	5.0	5.9	5.0	5.2	5.6	4.5

Source: FAO/IFA-Data P205 tonnes basis

234mt NH₃ in 2021, large increases expected in EECA, North America and Africa partially offset by massive reductions in China. North America capacity is growing while rising demand in Latin America and South Asia is expected to support higher imports by 2021. Between 2016 and 2021 the IFA forecast global nitrogen supply to expand by 1.8%, with demand of 1.2% per annum, with a rising surplus in 2017–2019. PotashCorp expects nitrogen markets to remain volatile to the end of 2017, leaving full-year gross margin "significantly weaker" than last year. The comments followed a July-to-September quarter in which gross margin for nitrogen dropped 70% year on year to \$21m, the weakest result in nearly nine years, reflecting a drop in average realized prices for ammonia to a 14-year low of \$168/t. Unlike urea, ammonia prices did not benefit from Chinese shutdowns.

UREA CAPACITY RISING BUT LITTLE GROWTH AFTER 2019

Global urea capacity is projected to increase by 17mt to 226 mt, with most of the growth mainly in North America, EECA and South Asia regions, occurring by 2019. The IFA estimate global urea supply at 200mt in 2021, growing at 1.6% p.a. over 2016, with demand for all uses forecast to increase especially in Latin America, South Asia and Africa.

HIGHER COSTS AND ENVIRONMENTAL CONCERNS RESTRICT CHINA'S EXPORTS

Urea prices surged 8% in the third quarter and are up a similar amount for the first nine months of 2017 on strong import demand, notably from Brazil where imports soared 41%. Supply outages in Indonesia, the Middle East, and North Africa, and limited export availability from China, helped push prices higher. Chinese exports declined sharply due to higher production costs, principally coal and increasing environmental constraints. Winter restrictions on coal production in China could further elevate costs. Demand in the US is expected to rise with autumn application, but significant new domestic capacity is expected to reduce imports. The global urea market is projected to be oversupplied with new capacity anticipated from countries with plentiful low-cost natural gas production, including Iran, Malaysia, Nigeria, and the US.

POTASH CAPACITY TO GROW BY 20% BY 2021

Global potassium capacity is forecast to grow to 65.5mt K₂O in 2021, with new projects in Canada, Russia, Turkmenistan, Belarus and China. The IFA forecast global potassium supply to increase by over 9mt to 53.3mt K₂O in 2021, North America region will have the largest potential supply in 2021 (35%), followed by EECA (34%), East Asia (14%) and other regions (17%).

The rise in PotashCorp's 62–65mt global shipments in 2017, is expected to continue in 2018. Demand for potash in North America to rise to 9.3–9.8mt, while in Latin America, shipments to rise to 12–12.5mt to meet substantial agronomic need. For China, nutrient affordability is expected to drive consumption forecast at a record 15.5–16mt. Improving demand environment in India, supported by higher minimum support prices and a favourable monsoon, likely to increase shipments to 4–4.5mt up on last year. Elsewhere in Asia prices for palm oil and improved moisture conditions, likely to support a rise in shipments to 9–9.5mt.

RISE IN CAPACITY AND MODERATE DEMAND INCREASES SURPLUS

Firm demand saw China's imports jump more than 25% during the first eight months of this year. Russian fertilizer producer Uralkali agreed to a new contract with India through June 2018 at \$240mt, up \$13mt from last year. While global demand for potassium is forecast to grow by 11% faster than either nitrogen or phosphates by 2021. But with the large capacity additions in this year and into 2018, the



\$4.1bn Bethune mine in Canada, owned by German-based K+S and the two projects developed by EuroChem, owned by Russian tycoon Andrei Melnichenko, contribute to a growing potential surplus likely to exceed 6.3mt in 2018 reaching 7.7mt K₂O in 2021.

Earlier in the year Credit Suisse forecast "significant downside risk" for potash prices, for the second half of 2017 and for 2018, a drop in demand in response to weak farmer economics, foreign exchange volatility and rebounding inventories. Prices, however, have held at Midwest terminals standing at \$255/t despite rising supplies, resilient prices attributed to a window of opportunity for fall offers, before price relief from the new Saskatchewan K+S plant is realized. PotashCorp announced on Sept 20 that it would temporarily cut production at its Allan mine for ten weeks from November and its Lanigan mines for eight weeks from December.

Previously, without the closures, the outlook was for softer prices after the fall application season, but with a cut in output, prices in the 4th quarter and into the 1st quarter in 2018 expected to be more stable.

LARGE SUPPLY OF PHOSPHATE ROCK EMERGING MOSTLY FOR LOCAL USES

Global phosphate rock supply is expected to grow by 10% to 249 mt in 2021, with 80% of the increase occurring in Africa and West Asia. Traded phosphate rock prices have declined sharply over the past year, triggered by overcapacity, particularly as OCP (Morocco) increased new rock capacity in-line with expansions at downstream facilities. Lower prices have severely pressured producer margins. Suppliers of low quality rock, like those in

Egypt, are operating on thin margins while some phosphate rock projects, like Kropz in South Africa, have been delayed in-part due to difficult market conditions.

MOROCCO AND SAUDI ARABIA TO INCREASE CAPACITY

Global phosphoric acid capacity is projected to expand, to 64.1mt P₂O₅ in 2021. The main processed phosphates would grow to 52.5mt P₂O₅ in 2021, especially in Morocco and Saudi Arabia. The global supply of phosphoric acid would increase each year by 2.4 per with demand to grow by 1.8%, pointing to a rising potential surplus from 2017-2019, stabilizing in 2021.

Phosphate DAP prices fell on weak import demand in some countries and rising supply, including higher exports from China, the world's largest producer. TSP prices edged up 2%, Hurricane Irma caused production outages in Florida that lifted prices, but phosphate prices are expected to weaken again as markets remain oversupplied, with the prospect of new capacity in Morocco and Saudi Arabia

Mosaic's CEO Joc O'Rourke saw positive developments in the phosphates industry following a challenging 2016 and despite Chinese exports in the first half of 2017, being higher than anticipated, Mosaic expects China to export fewer tonnes of phosphates compared to last year, which is key to the company's near-term outlook. PotashCorp forecast market fundamentals will continue to weigh on phosphate prices, following the July-to-September quarter in which the group's sales values averaged \$365/t, down \$20/t year-on-year, resulting in a \$45m loss in phosphates, in gross margin terms, compared with a profit of \$15m a year before, the worst result since 1998.

Naval Dome and Lloyd's Register team up to develop cyber security standards for ships

Israel-based cyber security specialist Naval Dome has signed a Memorandum of Understanding (MoU) with Lloyd's Register (LR), a renowned global provider of engineering and technology-centric professional services. The MoU is aimed at establishing standards and guidelines for maritime cyber defence.

As part of the collaboration agreement, LR will carry out a series of pilot tests using the company's cyber security software onboard a LR-classed vessel.

The Naval Dome system is the first multi-layer cyber defence solution developed specifically for maritime applications.

Ran Merkazy, Vice President – Product & Services Innovation (CTO Group), LR, said: "The objective is to establish standards around cyber defence in the maritime space, utilizing Naval Dome's expertise. We will then test the system with our customers to make sure that it provides the requisite level of security without disruption to their systems and operations."

Naval Dome's governmental level intelligence grade, combined with a specific focus on maritime defence and a product designed to minimize human interaction, were the primary reasons behind LR selecting the Israeli company as its project partner.

"The company has the right credentials and an excellent understanding of the maritime intelligence sector to be able to provide the advice we need to develop concise and effective guidelines for preventing system and data security breaches at sea," added Merkazy.

Itai Sela, Chief Executive Officer, Naval Dome, said: "The lack of guidelines and standards for creating a more secure maritime environment is the shipping industry's Achilles' heel. With human operator error

the cause of a significant number of security breaches, the MoU we have signed with Lloyd's Register will help create a more



Itai Sela, Chief Executive Officer, Naval Dome.

effective end-to-end solution for cyber defence."

Using intelligence agency security technology, Naval Dome's device blocks

existing systems and software, providing real-time cyber alerts and blocks malicious files to prevent unauthorized access to critical systems and data.

Independent of the LR collaboration, Naval Dome has already successfully demonstrated a ship's vulnerability to cyber-attacks.

"Our software engineering team performed a series of cyber-attacks on live navigation systems, engines and other machinery control systems. The attack was able to shift the vessel's reported position, mislead the radar display, turn on and disable machinery, and override the fuel control, steering and ballast systems. In a second test using the Naval Dome software, we carried out the same attack but were unable to penetrate any of the ship's systems," said Sela.

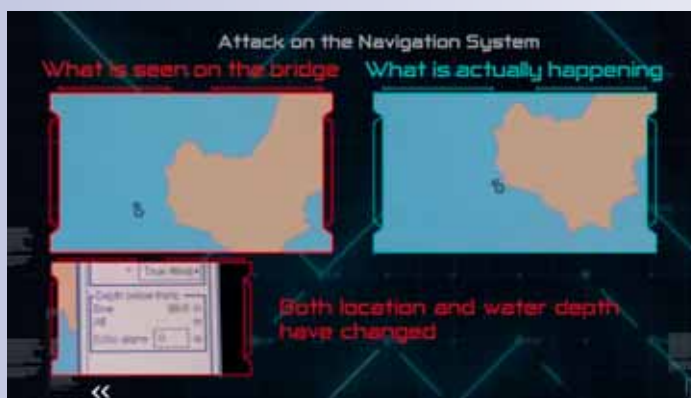
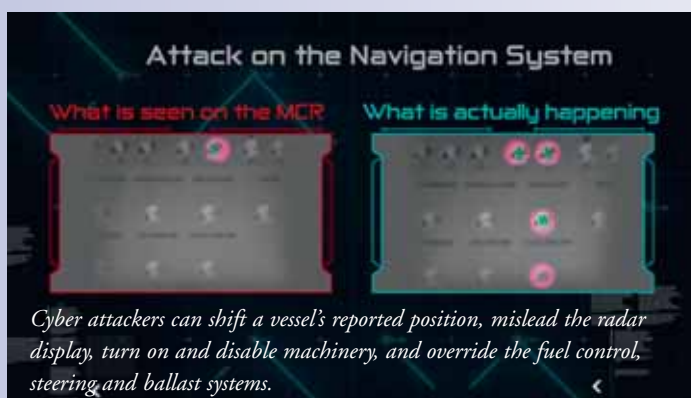
ABOUT NAVAL DOME

Naval Dome is an Israel-based cyber security specialist providing security detection and protection solutions to the international maritime industry. The Naval Dome solution is the first maritime multilayer cyber defence solution for mission-critical onboard systems.

ABOUT LLOYD'S REGISTER

Lloyd's Register (LR) is a global engineering, technical and business services organization wholly owned by the Lloyd's Register Foundation, a UK charity dedicated to research and education in science and engineering. Founded in 1760 as a marine classification society, LR now operates across many industry sectors, with some 8,000 employees in 78 countries. LR has a long-standing reputation for integrity, impartiality and technical excellence. Its compliance, risk and technical consultancy services give clients confidence that their assets and businesses are safe, sustainable and dependable.

Through its global technology centres and research network, LR is at the forefront of understanding the application of new science and technology to future-proof its clients' businesses.



internal and external cyber-attacks to provide maximum protection with minimal human intervention. It integrates with

Palau fleet grows as owners look for smart solutions

PISR NOW ONE OF THE FASTEST GROWING AND MOST EFFICIENT SHIP REGISTRIES

The Palau International Ship Registry has recently seen a strong increase in its fleet size as more shipowners and operators look to become a part of the new breed of smart registries.

As the Palau flag starts appearing on more vessels the appeal of a registry based on technology and detailed attention to service becomes more important to world shipping.

At the end of September 2017 the Palau flag fleet stands at 380 ships with 3,000,000 gross tonnage. The main Palau fleet now comprises 27% general cargo and 20% tankers, with the rest vessels accounting for 53% of its total ships covering all vessel types and across a wide range of countries. There have been increases in the number of barges, tugs and bulk carriers looking to fly the Palau flag and more recently, a growing number of yacht owners talking to the registry looking to join the fleet.

Panos Kirnidis, CEO of Palau International Ship Registry believes the flag has become increasingly attractive to ship owners looking for stability, security, attention to detail and technological advances.

“Since our inception in 2010 the registry has grown steadily with different types of

ships joining our fleet. We have a strenuous vetting process for all our ships and we know that owners, charterers and operators want a quality flag. As a relatively new one we know that attracting ships into our fleet takes time and our clients need to be comfortable with us, our operations and our quality management approach. This recent increase in fleet size shows we are sailing the right way,” says Kirnidis.

Smart ships and smart technology in running a fleet are currently driving shipowners to look more closely at who they entrust their vessels to. Panos Kirnidis is using the current world economic forecasts to reach out to the maritime industry to attract even more ships into the Palau fleet.

“We have been saying for more than a year that the maritime industry knows that smart ships and smart technology is the way forward and yet there seems to be reluctance on the part of some owners to fully embrace technology. When the world economy turns and the shipping world recovers, progress in technology will be one of the real driving forces. The time to embrace this technology is now. Smart ships are here and so are smart registries. Waiting until the world economy picks up might be the wrong time to switch registries.

PISR is the fastest growing and efficient ship registry, which is investing in advanced technology, highly experienced staff and is built on foundation of a fully electronic registry. We introduced a new Deficiency Prevention System (DPS) at the end of 2016 through a dedicated department monitoring all Palau ships to reduce deficiency and casualty rates. It's just one of the advances in looking after our fleet we feel puts us on course to be the smartest of smart flags in 2018.”

ABOUT PALAU INTERNATIONAL SHIP REGISTRY

The Palau International Ship Registry (PISR), an open registry headquartered in Houston, USA and has its European head office in Athens, Greece. PISR was created by an amendment to the Title 7 of the Republic of Palau National Code in 2010 and was appointed by the Government of the Republic to carry out the day-to-day management of vessels registered to the flag as the Ship Registry Administrator.

- ❖ PISR provides full administrative and technical support to the registration of vessels.
- ❖ PISR is an active member of both the IMO and ILO and is a member of BIMCO, WCPFC.
- ❖ Compact agreement of Free Association (COFA) with USA.

Don't overlook the risk of cargo fires

Cargo fires occur so infrequently that awareness of the risk can slip under the radar. Yet such an incident on board a vessel can have disastrous consequences including loss of life or catastrophic loss of the vessel involved. With the average cost of a cargo fire at several million USD, cargo fires are not a risk to be overlooked.

The Swedish Club, working in conjunction with Burgoyne's, experts specializing in the investigation of fires, explosions and other major incidents, has produced a handbook, *'Fire! A guide to the causes and prevention of cargo fires'*, which can be used alongside the regulations to assist seafarers in their daily loss prevention efforts.

'Fire!' offers loss prevention advice on a number of incidents – focusing specifically on self-heating cargoes, but

also examining those vessel fires caused by other sources such as cargo hold lights, fumigation, movement of cargo and of course smoking and hot work. It also highlights how different vessel types fare when the frequency of cargo fires is compared.

Tanker figures are found to be relatively low, a testament to the tight regulation and safety culture that exists in this industry. On the other hand ro-ro figures are surprisingly high due to the non-homogeneous nature of the cargo they carry.

Lars A. Malm, The Swedish Club's Director Strategic Business Development & Client Relations, is clear about the importance of the guide: “When a fire breaks out on board a vessel there is no fire service ready to assist in extinguishing it – that is up to

the crew themselves. All those who have worked on board a vessel are aware of the difficulties involved with managing a fire and the crucial importance of fire prevention.”

Burgoyne's Partner, Neil Sanders, explains: “Self-heating and related issues can affect a wide variety of cargoes including coal, iron in the form of direct reduced iron (DRI), metal turnings, charcoal, seed cake, biomass, fertilizers, solid chemicals and liquid chemicals. Whilst the full relevant International Maritime Solid Bulk Cargoes Code (IMSBC) or International Maritime Dangerous Goods Code (IMDG) requirements must always be understood and followed, *'Fire!'* is aimed at supporting that understanding and providing valuable support to the seafarer.”

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The end of the paper chase: DNV GL rolls out electronic certificates across entire fleet

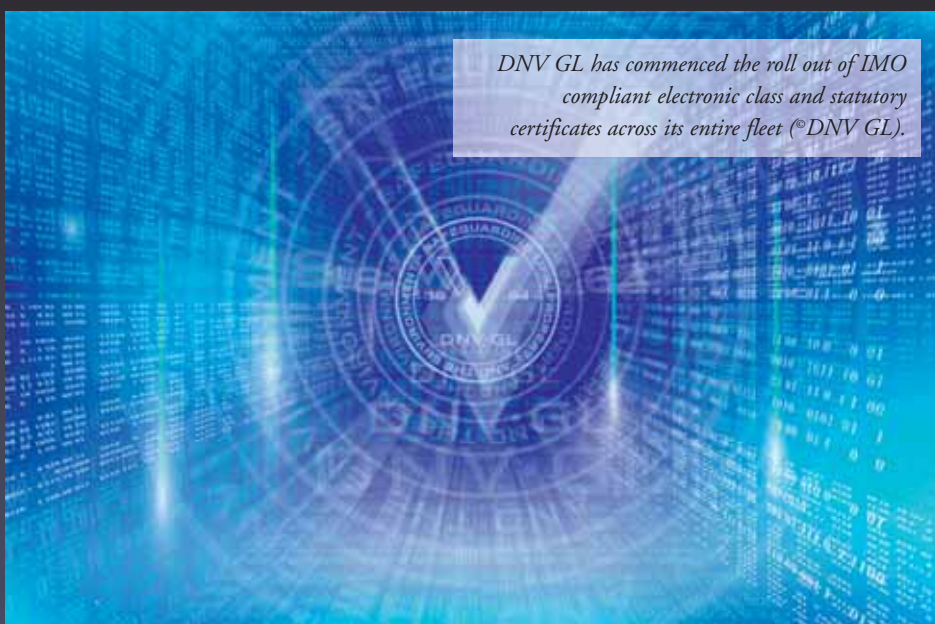
In a historic first for the ship classification industry, DNV GL has commenced the roll out of IMO compliant electronic class and statutory certificates across its entire fleet. The widespread use of electronic certificates will result in significant efficiency gains for ship owners, charterers, regulators and crew, cutting down administrative burdens, processing time and document handling costs.

For the past few years, DNV GL has been working on pilot projects with several owners and flag administrations, to test and gain acceptance for the use of electronic certificates. This has resulted in almost 50 flag state administrations already having granted DNV GL the authority to issue electronic statutory certificates on their behalf, with more acceptances expected in the near future.

“The electronic certificate regime offered by DNV GL has provided us with a unique advantage in the contemporary market, where leverage from digitalized high-end efficient work processes plays an integral role,” says Morten Nygaard, Fleet Manager, Teekay Offshore, owners of one of the vessels used in the pilot projects. Teekay Offshore is also looking to move their fleet to electronic class and statutory certificates as soon as possible: “It is our intention to benefit from the new regime within the shortest possible timeframes,” he added.

Certificates are published on DNV GL’s customer portal immediately after an onboard survey is completed, so that all relevant parties can access the latest certificates from anywhere in the world. The electronic certificates are secured with a digital signature and a unique tracking number (UTN) which can be checked online, assuring their validity and authenticity.

“Over the last several years we have been leveraging digitalization to improve the experience of our classification customers,” says Knut Ørbeck-Nilssen, CEO of DNV GL – Maritime. “The roll out of electronic certificates is a significant step forward in our pathway



DNV GL has commenced the roll out of IMO compliant electronic class and statutory certificates across its entire fleet (©DNV GL).

towards modernizing classification. Electronic certificates will smooth our customer’s interactions with class, allow stakeholders across the industry to capture value from digitalization, and give us a platform for future improvements.”

Customers can choose to share access to their certificates with stakeholders (charterers, ports, flag administrations, insurers) by using temporary access codes. With the temporary code the stakeholder can directly access the customer’s secure certificate folder, bringing the administrative burden on the ship owner down to the absolute minimum.

Electronic certificates will be rapidly rolled out across the DNV GL fleet, with newbuilding vessels receiving certificates upon delivery, and existing vessels at their next scheduled survey or audit.

At the same time as electronic certificates will be deployed through DNV GL’s production system, customers will also be able to take advantage of the new Smart Survey Booking tool (SSB). SSB uses smart algorithms and machine learning to help customers find the best time and place to book a survey.

The algorithms identify when the maximum number of survey items can be combined, by assessing the initiation and expiration dates for class surveys, audits and conditions.

An estimation of the required time the ship needs to be available for the survey/audit, with the associated travel

and costs is also generated. SSB will even recommend a port of call based on all of these factors. Finally, after a customer makes the booking, SSB provides a set of survey preparation documents for the crew of the vessel, enabling them to prepare more effectively.

ABOUT DNV GL

Driven by its purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. It provides classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas and energy industries. It also provides certification services to customers across a wide range of industries. Operating in more than 100 countries, DNV GL’s professionals are dedicated to helping its customers make the world safer, smarter and greener.

ABOUT DNV GL – MARITIME

DNV GL is a major global classification society and a recognized advisor for the maritime industry. It aims to enhance safety, quality, energy efficiency and environmental performance of the global shipping industry – across all vessel types and offshore structures. It invests heavily in research and development to find solutions, together with the industry, that address strategic, operational or regulatory challenges.

Millard Maritime makes its mark



US Gulf port facility moves further into the bulk and breakbulk markets

Millard Maritime has been active on the US Gulf coast for over ten years. The company is privately owned.

Millard operates a deep water port facility, centrally located on the US Gulf coast, featuring a multi-berth large marine terminal boasting a 1,600ft wharf, with export and import capabilities for all types of bulk material.

Originally constructed as a cold storage warehouse to export poultry products, the facility was repurposed in May 2013 to handle general cargo — liquid, dry bulk, breakbulk and special projects.

Millard uses a wide range of equipment — including Superior brand mobile conveyors, related receiving hoppers and shiploaders, multiple brands of front-end loaders and excavation machines, various types and sizes of fork lifts along with a host of transit trucks — to handle a wide range of bulk and breakbulk:

Millard Maritime's focus is on dry and

liquid bulk cargoes, including:

- ❖ **aggregates:** these include sand, gravel, pebbles, crushed limestone, and stone and are imported in bulk. They are destined for construction sites across the country for use in structural foundations.
- ❖ **chemicals:** largely as a result of North America's competitive advantage in sourcing natural gas, the chemical industry is growing in the southeastern United States. Millard's Theodore, Alabama port, located in the centre of the US Gulf Coast is well positioned near numerous chemical and petro-chemical manufacturing plants. Coastal rail routes, along with Interstate 10 and 65 provide easy and advantageous access to customers moving bulk cargo into or out of the region.

DEVELOPING FOR THE FUTURE

Millard Maritime has its eye on the future,

and part of this includes the expansion of a 300-acre multi-use site. Plans include a build-out of the tank farm, specifically to accommodate speciality liquid cargo storage needs. Also planned is an addition to its rail capacity enabling it to handle unit trains as well as increase its railcar storage capacity, which is currently in excess of 100 railcars. Further, it has a long-term intention to extend its 1,600ft seawall by an additional 2,000ft plus bulk heading its 24 acre barge harbour. Millard's build-to-suit model will dictate further infrastructure expansion as well.

GROWING THROUGHPUT

Millard Maritime handles a large volume of bulk/ breakbulk/project cargo each year, in the hundreds of thousands of tonnes, and this figure is increasing every year. Volumes have steadily increased and forecasts indicate continuation of the same positive outlook.



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- ❖ PORT



- ❖ Privately owned
- ❖ Deep water draft
- ❖ 300 acres available
- ❖ Direct served by Class 1 Rail



ADAPTING TO NEW MARKETS

There is a significant global move towards the shipping — and use — of biomass cargoes. To date, Millard Maritime has handled some biomass cargoes on a ‘one-off’ basis, though these have not yet had a major impact on annual throughput.

Millard Maritime is always looking to the future, and would be interested in handling growing volumes if conditions are favourable.

CUSTOMER RELATIONSHIPS

Millard Maritime enjoys stable relationships with its existing contract customers. However, it knows that it has considerable untapped potential, and plans to attract many new customers.

The company’s willingness and ability to

customize its service offerings to best meet its customers’ needs is a great advantage, as is its desire to construct infrastructure as well as purchase equipment to handle specific cargoes.

As a privately owned port facility, Millard Maritime can efficiently evaluate opportunities with potential partners to result in mutually beneficial long-term relationships.

PORT FACILITIES

Millard Maritime is able to host two Panamax vessels on dock at the same time, but more commonly handles cargo to and from Handymax-sized vessels.

Touch up dredging alongside the seawall is not regularly required – perhaps every five years or so. Dredging has not affected

cargo operations to date, nor does Millard Maritime expect it to due to its multi-berth capability and minimal dredge requirements.

In terms of security, Millard Maritime is a TWIC (Transportation Worker Identification Credential) facility, maintaining security in strict compliance with the same. It continually monitors its site with security concerns in mind, and will develop additional security measures whenever it foresees any concerns.

The company also boasts an impressive safety record, with no loss-time incidents in over two years.

For more details on Millard Maritime’s history and competencies, please see pp27–28 of the September issue of *Dry Cargo International*. **DCi**





Improving market for Handymax bulk carriers



Richard Scott

Freight rates for bulk carriers in the Handymax size group have recovered in the past twelve months, after plummeting to very depressed levels. Cautious optimism, from a shipowner's viewpoint, suggests that the improved market could continue over the year ahead. Signs have emerged indicating further progress towards a better global balance between demand and supply, implying more remunerative freight rates.

Handymax bulk carriers, medium-size dry cargo vessels with a carrying capacity range of 40,000 deadweight tonnes up to 65,000dwt, are benefiting from two trends. Growth in the commodity trades employing these ships has picked up, while fleet expansion has decelerated, resulting in a reduction of over-capacity and, consequently, a tightening market.

The popularity of Handymax bulkers, with their highly flexible employment potential, led to over-investment in the segment. In the early months of last year, after a lengthy period of subdued conditions, freight rates sank to distress levels and prospects for recovery seemed to have receded into the distant future. Low market sentiment finally ended shipowners' enthusiasm for ordering new ships. Since then, newbuilding orders placed have been minimal.

Amid a stronger performance this year by many global commodity movements, the dark clouds overshadowing the market are beginning to lift. There is still uncertainty about the sustainability of solid trade expansion. But the decline in Handymax and other newbuilding orders implies a sharp slowdown in fleet growth over the

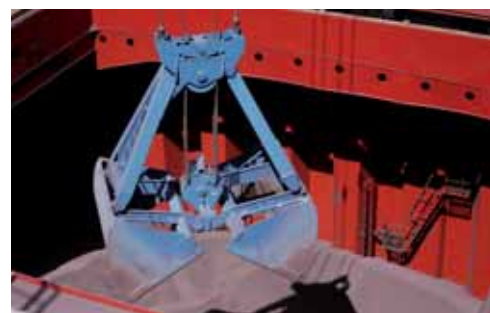
next twelve months — assuming that lower deliveries are still accompanied by substantial scrapping — which could assist freight market recovery.

TRADING POTENTIAL

Positive ideas about employment growth potential in the future reinforced past popularity of these ships as investment opportunities. Handymax bulk carriers are among the most flexible ships for operating around the world, providing versatility within a very broad range of dry bulk commodity trades. While that characterization remains valid, an adjustment of the vessel demand and supply balance in the market became necessary to ensure viable trading.

Handymax design features promote their inherent attractions. A typical ship is

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HANDYMAX (40–64,999DWT) BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2012	2013	2014	2015	2016	2017
Newbuilding deliveries	20.9	14.7	11.4	16.0	13.2	11.0
Scrapping (sales)	4.7	3.5	3.2	3.1	4.3	3.5
Losses	0.1	0.2	0.0	0.1	0.0	0.1
Plus/minus adjustments	0.2	0.0	0.0	-0.1	0.0	0.0
Fleet at end of year	147.6	158.6	166.8	179.5	188.4	195.8
% change from previous year-end	+12.2	+7.4	+5.2	+7.6	+4.9	+3.9

source: Clarksons (historical data) & BSA 2017 forecasts

*forecast

a 'geared' vessel (cargo-handling gear installed), with cranes and grabs for loading and discharging cargo. Sub-categories of larger ships within the group are Supramax and Ultramax.

Installed cargo-handling equipment enables efficient operation in trades where shore-based equipment is either unavailable or inadequate. It also facilitates handling cargo offshore, from or into barges, at an anchorage. Bigger bulk carriers in the Panamax and Capesize groups usually are 'gearless', and therefore are totally dependent on cargo-handling by port equipment.

Handymax dimensions are acceptable at a wide range of ports, on most trade routes, while offering some economies of scale. The result is often an extremely varied Handymax employment pattern. Usage in the coal, and grain and soya, trades is frequent and there is sometimes involvement in iron ore. Minor bulk commodity trades also provide numerous cargoes: steel products, ores and minerals such as nickel ore, other industrial cargoes, fertilizers and various agricultural commodities including oilseeds and meals all feature prominently.

Investment interest firmly shifted towards higher capacity vessels of 60–65,000dwt, provided by 'Ultramax' bulk carrier designs at the top end of the Handymax size range. Previously the 'Supramax', typically 52–57,000dwt, was the preferred unit and became ubiquitous, taking over from smaller Handymaxes

below 50,000dwt.

SLOWING FLEET GROWTH

The world fleet of Handymax bulk carriers is still growing quite briskly, albeit at a decelerating rate. After expanding by well over 7% in 2015, last year's increase was under 5%, followed by an estimated 4% growth this year, as shown in the table. But in 2018 a further, much sharper, slowdown seems almost certain to occur.

Figures compiled by Clarksons Research show that Handymax capacity reached 188.4 million deadweight tonnes at the end of 2016. There were 3,442 vessels within the size group. This total comprised 24% of the entire world fleet of all sizes of bulk carrier. Over a period of five years Handymax capacity had increased by more than two-fifths.

During the 2017 first nine months, fleet deadweight capacity was augmented by over 3%, boosting the total to 3,536 ships amounting to 194.9m dwt at the end of September. Newbuilding deliveries remained large, accompanied by reduced scrapping.

Since a newbuilding deliveries surge ended five years ago, shipyards around the world have completed between 11m and 16m dwt of new Handymaxes annually, including 13.2m dwt in the most recent period. Scrapping in the past few years has remained quite modest, within a fairly tight 3–4m dwt range, including 4.3m dwt in 2016, equivalent to about 2% of the fleet recycled each year.

One prominent feature is the difference between the average size of newbuilding vessels delivered into the fleet, and the average size of those sold for demolition. Last year deliveries averaged 60,800dwt, confirming the popularity of the Ultramax category at the top end of the Handymax range. Ships sold for scrapping averaged 44,800 dwt, representing an earlier era when the 40-50,000 dwt size was seen as most valuable.

Deliveries of newbuilding Handymaxes in 2017 as a whole look set to diminish. The pace seen so far, coupled with expectations for the remaining months, suggests that a 10–15% or more reduction compared with last year could be seen. It is still very difficult to estimate a figure precisely because orderbook slippage, delays and postponements are hard to assess.

Scrapping this year also seems likely to decrease, possibly by around 20%, although this also is not easy to predict. An unexpected sharp change in freight market rates and secondhand vessel values in the year's final weeks could have a large impact on the total.

FURTHER FLEET DECELERATION

Looking ahead to 2018, an abrupt deceleration of fleet capacity expansion seems certain to happen. The global orderbook schedule for new Handymax bulk carrier deliveries in the next twelve months or more is very low, which is expected to greatly reduce the inflow of

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additional capacity. Meanwhile scrapping will be at least a partial offset. But both flows will be affected by how freight market conditions evolve, and by market expectations and sentiment.

A rough guide to the amount of future fleet capacity likely to be added is provided by newbuilding orderbooks at shipyards. Although

contracting for new Handymaxes almost ceased last year, previous heavy ordering (especially for Ultramax designs of around 60,000dwt) has resulted in a total which is still sizeable. This total has been declining rapidly, however, as deliveries far exceeded incoming new orders. Currently, four-fifths of the Handymax orderbook's deadweight capacity is comprised of Ultramax vessels.

Events over the past two years dramatically changed perceptions about the outlook for the freight market and investment returns, affecting willingness to invest in buying new ships. Previously (in 2013 and 2014) a remarkable ordering spree for new Handymaxes was heavily influenced by ideas that a freight market recovery might be on the horizon. Coupled with attractive prices quoted by shipbuilding yards, many shipowners saw a strong incentive to invest. During those two years 790 Handymax ships were ordered, a colossal number totalling 48m dwt, equivalent to about one-third of the fleet at the beginning of the period.

Newbuilding contracting dynamics changed spectacularly during 2015 and 2016, one of the most striking changes in the modern era. Collapsing new orders placed were seen in all bulk carrier size groups. Within the Handymax sector ordering became minimal. Just 11 ships were ordered in 2016, after a reduced 131

in the preceding year, according to Clarksons Research, followed by a further 18 added in the first nine months of the current year.

Reflected in this collapse is the prolonged period of depressed freight rates and sceptical views of potential for market recovery, although shipowners' confidence has begun to revive during recent months. Over-capacity in the Handymax and other bulk carrier segments is still a prominent feature, and an extended adjustment period appears to be needed before a more balanced market is fully restored.

While continuing to contribute to enlarging fleet capacity, the Handymax orderbook for all delivery years is now down to a low total of about 10m dwt or 5% of the existing world Handymax fleet. A large proportion is scheduled for completion in the period up to the end of next year.

Fleet growth will be affected also by another major influence. Uncertainty about future recycling activity is always a key imponderable for the immediate future and further ahead. Vessel age aspects alone indicate limited potential for scrapping old tonnage. The Handymax fleet is relatively young. Only 6% (about 12m dwt) is over 19 years old, mostly in the 40–50,000 dwt size sub-group. Nevertheless, tightening regulations and compliance costs are likely

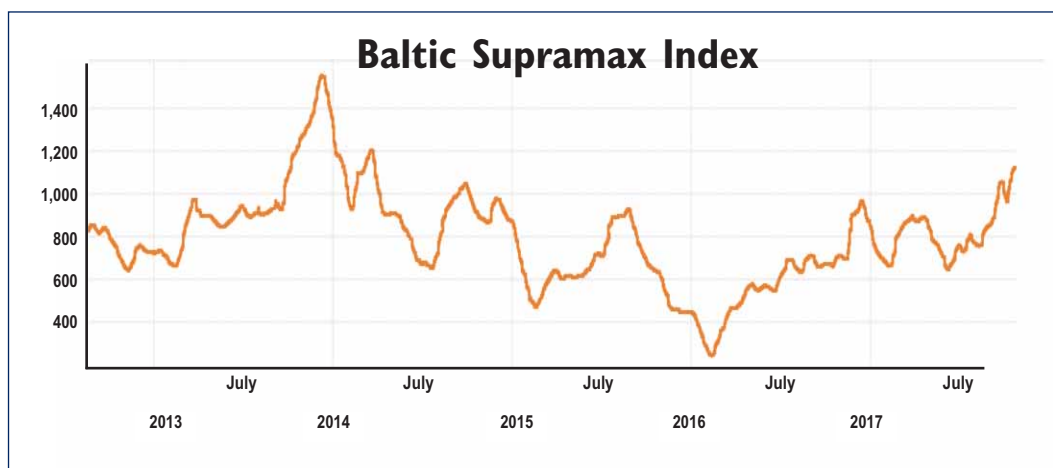
to encourage more scrapping, although not necessarily in the short-term.

ENLARGING EMPLOYMENT PATTERNS

Trading patterns show that typical features offered by Handymax bulk carriers ensure wide employability. Almost all dry bulk commodity trades are accessible, with only a few limitations. However, major proportions of global iron ore and coal movements do not normally employ Handymaxes, because the bigger Panamax, Kamsarmax and Capesize bulk carriers can be accommodated on many routes. Preference for these larger sizes reflects greater economies of scale, usually providing cheaper transport.

One of the most prominent users of Handymaxes is coal trading. Both main parts, steam coal and coking coal, often use bigger ships but Handymax size cargoes amount to huge volumes. In total, seaborne coal trade is the second largest global dry bulk commodity trade after iron ore, amounting to a massive quantity exceeding 1,100 million tonnes last year, comprising well over one-fifth of all global dry bulk cargo movements.

Coal trade remains extensive despite negative influences which prevented growth in the past two years and resulted in the annual world total declining. Weakening import demand in a number of



countries caused consecutive falls of 6% in 2015 and under 1% in 2016, after vigorous growth over many years. During 2017 signs of reviving growth have emerged. Movements consist of steam coal (used chiefly in power stations, and also in other industries), and coking coal (used in the steel industry). Steam coal is the largest category, comprising over three-quarters.

Shipments from Indonesia, mainly steam coal, utilize Handymaxes extensively. Indonesia is the world's largest exporter of this coal type, with a total estimated at about 311mt last year. That annual volume is the equivalent of about 6,000 Supramax cargoes, although many individual cargoes are larger. Much of this trade comprises short-haul shipments to China, which limits the vessel employment duration on a single voyage, restraining demand.

China's huge steam and coking coal imports together regained momentum in 2016 after a sharp downturn, and have continued to strengthen this year, benefiting Handymax involvement. Coal imports (including lignite) rose by 25% to reach 256mt last year. Conversely in India, also one of the world's largest importers, annual volumes have fallen in the past two years. An 11% decline to 196m was seen in 2016 and another reduction may follow, with negative implications for bulk carrier employment.

Global trade in grain and soya also provides numerous cargoes for Handymaxes. This market segment is characterized by highly variable and unpredictable changes in geographical patterns and quantities. During the past crop year ending mid-2017 global trade in wheat and coarse grains, and also in soyabeans and meal, increased solidly. The current 2017/18 year ending mid-2018 could see further increases.

According to International Grains Council calculations, world trade in wheat plus corn and other coarse grains was 7mt or 2% higher in crop year 2016/17 ending June, compared with the previous twelve months, reaching 352mt. World trade in soyabeans and meal was 10mt (5%) higher in marketing year 2016/17 ending September, at 205mt, based on US Dept of Agriculture estimates. Additional soyabeans but lower grain imports into China was the most notable change among importers in the recent period.

The versatility of Handymax bulk carriers enhances their suitability for carrying grain cargoes. A constantly changing global pattern of trade is clearly visible. Many large variations from year to year in the volumes available in exporting countries and variations in quantities required in importing countries, often reflecting the latest harvest fluctuations, frequently benefits Handymax usage. Port and storage limitations in many countries also provide opportunities.

Over the twelve months ahead, wheat and coarse grains imports into the Middle East area, North Africa and the European Union may rise, but China's purchases are expected to continue falling as a result of excessive corn stocks. Conversely China's soyabeans buying could continue on an upwards trend, accompanied by additional soya imports into a number of other countries.



Handymaxes are widely employed carrying cargoes in the 'minor dry bulk trade' category as well. Many elements of this commodities group are actually large, collectively amounting to massive annual volumes. The commodity range is extensive and in 2016 the overall total appears to have been over 1800mt. After apparently minimal growth in the past couple of years, a pick up now seems to be under way.

Steel products (coil, sheet, plate and other items), and forest products form the biggest individual minor bulk trade components, although not all quantities are carried by bulk carriers. Big volumes are contributed by the bauxite/alumina (aluminium raw material), fertilizer raw materials and semi-finished fertilizers, and cement trades accompanied by large quantities of ores and minerals such as nickel and manganese ore.

Exports of steel products from China is an especially prominent example, a huge trade frequently employing Handymaxes. This trade weakened last year amid a

strengthening domestic market and pressure to cut shipments to some foreign markets. The annual total of China's steel exports to all destinations declined by 3% in 2016, down to 108mt. Another decrease seems likely in the current year.

FREIGHT MARKET PICK UP

Improved freight rates for Handymax bulk carriers have been seen this year, amid signs of a reduction in surplus capacity both in this size group and others. Slowing growth in the world fleet of Handymaxes has unfolded, coupled with a stronger performance in some of the commodity trades employing these ships. Consequently, the market imbalance has begun to diminish.

Following a rebound in the second half of last year from very depressed levels earlier, further progress in the upwards trend has occurred during 2017. The Baltic Supramax Index (calculated by the Baltic Exchange), a useful indicator of the sector's freight market progress, recently reached around 1,000 points, after remaining mostly within a 700-900 band in preceding months. These levels are much higher than the first half 2016 band below 600 points and down to 243 at its lowest.

What are the prospects for this market sector over the next twelve months or so? Although the Handymax size group is a distinct market segment, it is not isolated from the bulk carrier market as a whole. Over-capacity is still substantial but there are now clearer signs of a better balance evolving across the bulk carrier size groups. An imminent, possibly sharp further slowing in fleet growth could ensure that trade and vessel demand expansion matches or exceeds capacity enlargement during the next twelve months.

There are still many uncertainties, both on the demand and supply sides of the dry bulk freight market outlook. Despite a brisk revival of global seaborne trade momentum this year, key elements of the commodity flows carried by Handymax bulk carriers — coal, grain and soya, and minor bulks — remain difficult to predict. Nevertheless, more controlled fleet growth in the Handymax and other vessel sizes could enable a sustainable solid improvement in the market balance and freight rates to become firmly established.

Nemag grabs: use of prototypes enables continuous development and optimization

INNOVATION

The dry bulk terminal operator environment is changing quickly. This calls for innovative solutions to address these new market challenges, including enhanced safety, increased productivity, reduced maintenance costs and reduced labour costs, to name just a few.

The strong drive for innovation is an important, if not the most important, pillar of Nemag's success. One of the innovation goals set in 2009 was to develop the most optimal grab by means of virtual prototyping. Developing new grab types and making significant design changes has traditionally been a slow, expensive and high-risk process. It is a complicated process and predicting the performance of a new grab design is difficult. This traditionally led to step-by-step development based on empirically acquired results known as the play-it-safe approach.

VIRTUAL RAPID PROTOTYPING

Nemag wanted to accelerate this engineering process by substituting the slow learning-by-experience method with virtual rapid prototyping. The company therefore launched a ground-breaking research and development project in 2009. The goal was to create



NEW FASTER LIGHTER STRONGER



The new nemaX® grab for iron ore, >10% higher productivity than all comparable clamshell grabs, way stronger and the lowest maintenance cost ever.

Want to know more?

nemag.com/nemax

nemag 

a validated software design tool capable of predicting the combined behaviour of grab and bulk material.

In close collaboration with Delft University of Technology and the TATA Steel Plant in IJmuiden (NL), Nemag initiated a PhD research project and developed special simulation software to analyse and visualize the interaction between the grab and bulk material. This resulted in the Virtual Prototyping Software System, which provides valuable insight into the behaviour of grabs in material in a virtual environment and also helps to optimize the lifespan of wear-induced parts in the grab.

A REVOLUTIONARY NEW GRAB MECHANISM

All available data, experience and knowledge was combined and this resulted in the development of a revolutionary new and unique grab for iron ore: the nemaX®.

This new generation of grabs combines the lowest deadweight and the highest payloads with the shortest closing time. The result is a 10% productivity increase, lower maintenance costs and considerable time savings during the trimming phase.

ABOUT NEMAG

Nemag, a family business founded 93 years ago, is a popular partner for the handling of dry bulk materials

and has a strong reputation around the world. Nemag provides a full range of grabs and various types of quick-release links and rope pear sockets. Whether it is the handling of coal and iron ore, loading and unloading wheat, silage, scrap materials, minerals, biomass or other bulk goods, Nemag has a sufficient and reliable solution.

The aim is always to reduce handling costs per tonne of dry bulk materials transferred for steel plants, power stations, OEMs and commercial terminal operators.

In addition to customized grab solutions, Nemag has also successfully introduced a fully standardized series of

clamshell grabs for mobile harbour cranes such as Liebherr and KONE-Gottwald cranes. The very competitive standardized solutions with short lead times and extremely productive properties are used by the biggest and most successful bulk handling companies in over 60 countries.

The key to the company's success lies in its innovative capacity and its development of new products for the dry bulk industry. This, in turn, has led to several innovations, such as the invention of the scissor grab type, specialized rubber-lined lip sealing systems for handling powdered cargo, the patented Nemag quick-release link and the

Nemag rope pear socket, and the introduction of a new generation of environmentally-friendly clamshell grabs. For the latter, Nemag was awarded the IBJ Innovation Award in 2014 by the *International Bulk Journal*. So far, Nemag is the only grab manufacturer to receive an award in this challenging category.

Alongside innovation, customer support and a very intensive after-sales service are of paramount importance to both Nemag and its customers. A global network of specialized representatives supported by Nemag specialists is available to support customers.





Ballast water treatment system launches



Coldharbour unveils BWTS for big bulkers at Kormarine

Coldharbour Marine, a UK-based manufacturer of inert gas generators and ballast water treatment systems, launched a new version of its inert-gas based GLD™ treatment plant, designed specifically for large bulk carriers, at marine trade exhibition Kormarine, in October. The company's unique technology for bulk carriers is based on existing treatment systems for tankers and gas carriers but will be configured differently.

In a standard type Coldharbour BWT installation inert gas is sent to GLD (gas lift diffusion) units mounted inside the ballast tanks. There are challenges with this arrangement on bulkers insofar as the wing tanks and heavy ballast cargo tank arrangements do not lend themselves to this kind of installation.

The alternative, developed by Coldharbour in conjunction with several ship owners, is to mount a bank of GLD units inside the machinery space and to then circulate water from/to the ballast

tanks for treatment. The GLD process is unaffected by this change, but it means that tanks of any size and configuration can now be treated using the proven, reliable GLD process. As with the standard arrangement, treatment takes place during a section of the ballast voyage, rather than during uptake or discharge. No intake filtration is required. This guarantees that not only will the ballasting process be unaffected, but also that the ballast water discharged at the load port will avoid the problems of organism regrowth during long ballast legs, thereby ensuring compliance with IMO/USCG discharge standards. "A completely new system is essential for big bulk carriers, and in particular one which enables bulker operators to avoid operational delays, financial penalties and, in the worst case, possible off-hire periods due to BWTS issues," declared Andrew Marshall, Coldharbour Marine CEO. "That is why we have tailored our technology to meet the

demands of these vessels. We are delighted to be unveiling this exciting development at Kormarine where we will be talking both to dry bulk operators and shipyards about our new technology which we believe breaks new ground."

"These large ships have very specific requirements because of the huge volumes of ballast they require and the nature of their ballast operations makes using other solutions challenging," Marshall explained. "With the ballast water convention coming into force, and Port State Control bodies gearing up to enforce the regulations, the financial penalties of making a poor choice of ballast water treatment installations, particularly for large bulk carriers, could be catastrophic."

During ballast voyages, bulk carriers need ballast water for stability but also to make sure that ships' propellers are properly immersed. Upper wing tanks are used, as well as lower wing tanks, because carrying ballast higher in the ship raises its

centre of gravity for safe seakeeping (see 'The ship science', below).

Since the IMO's Ballast Water Convention lays down strict discharge standards, ballast water now shipped in upper wing tanks must be treated before it can be discharged. However, Marshall points out that there is no technology available today that can treat large volumes of ballast water as it is taken on board during and after cargo discharge whilst still guaranteeing that ballast water discharge standards will be met when the vessel arrives at the load port, probably at the end of a long voyage.

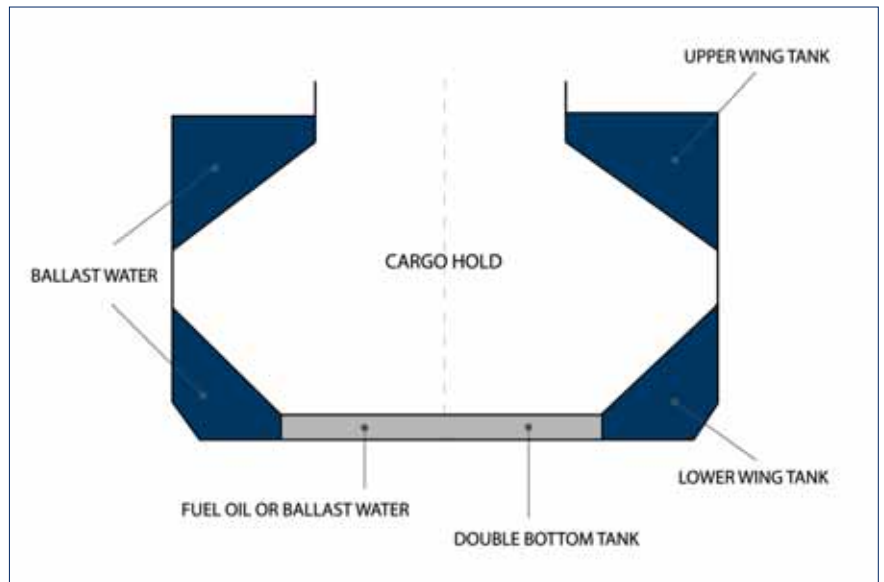
Marshall does not believe that the "regrowth" issue has been properly addressed either by the IMO or US Coast Guard type approval processes. No treatment system is completely effective, he argues, so regrowth on longer voyages is inevitable. This is supported by the overwhelming body of scientific data. Therefore, Coldharbour's technology, optimized as it is for the large long haul vessels, employs a treatment process that takes place during a part of the voyage, rather than during uptake or discharge.

"The regrowth test for IMO is only five days after treatment, whilst the much vaunted USCG TA actually only tests for one day! Some of these large bulkers have ballast legs more than ten days and in extremis as long as 42 days. Even if a relatively small number of marine organisms survive the initial treatment process, they will have plenty of dead organisms to feed on over a long ballast voyage," he commented. "If ballast water fails to meet the discharge standard, there will be delays and penalties, and possible long-term reputational damage.

"That's why we sat down to think about the particular challenges faced by the operators of these vessels, and we feel that the Kormarine arena will provide an ideal opportunity to talk about it. After all, most large bulkers are built either in South Korea or China, and Asia is the world's largest consumer of bulk cargoes, especially iron ore."

THE SHIP SCIENCE

Bulk carriers are designed and built principally for the carriage of dry commodities including iron ore, coal, grain, phosphates and bauxite. The majority of the fleet consists of ships in the so-called "Handysize", "Handymax" and "Supramax" categories ranging from 30–60,000 dwt. However, on long-haul routes, Capesize vessels and even larger very large ore carriers are often deployed to move large



volumes of dense cargoes, including iron ore and coal.

For these vessels, ballast water plays an essential role in their safe operation when they are not loaded. This is because ballast water is vital in ensuring a ship's stability and ultimately guaranteeing the safety of her structure and her crew. Large volumes are required to ensure hydrodynamic efficiency and full propeller immersion.

Iron ore is the single largest dry bulk



*Andrew Marshall,
Coldharbour Marine CEO.*

cargo. It is very dense at approximately 2.5 tonnes/m³ and relatively small volumes soon take a ship down to her maximum permissible draught. Alternate hold loading is frequently used as a technique to minimize longitudinal stress on a bulk carrier's hull girder, but when a vessel is not loaded, huge volumes of ballast are required for safe operation.

Satisfactory stability is essential in ensuring that a ship rights itself as it rolls in a seaway but it must be carefully controlled to prevent cargo shifting in the holds and

excessive accelerations which cause discomfort for passengers and crew. A ship's GM, or metacentric height as it is known — the distance between its vertical centre of gravity and its metacentre — is the key element in making sure that a ship is stable. For this, a positive GM is required — in other words, a vessel's centre of gravity must always lie below her metacentre.

However, the size of the GM determines a ship's seakeeping characteristics. If it is too big, a large righting moment at small angles of heel will make the ship "stiff" and uncomfortable. Large accelerations can affect safety and cause damage to equipment and cargo. A smaller GM, on the other hand, gives a small righting moment which results in a "tender" ship — one which rolls more slowly without excessive accelerations.

Bulk carrier operators, therefore, like to use the upper wing tanks (see diagram), sometimes also known as upper hopper tanks, for ballasting purposes because this raises a ship's centre of gravity and reduces the GM. Traditionally, ballast water from these large tanks is released directly overboard without treatment. Now, the treatment, pumping, piping and power systems required to treat large volumes of ballast to comply with the IMO's Ballast Water Convention discharge standard pose a major economic and operational challenge for ship operators.

The issue is further complicated by the fact that most system technologies treat ballast water as it is pumped on board. No single system is completely effective, however, and large bulk carriers deployed on long-haul routes may be subject to "regrowth" during a ballast voyage. This could well mean that discharge standards at the next loading port cannot be met. **DC**

Redcar Bulk Terminal secures major new contracts



A ship discharging its cargo at Redcar Bulk Terminal.

In early October, Redcar Bulk Terminal (RBT) in the UK announced it has secured a series of major new contracts.

The terminal, on the south bank of the River Tees, has announced a long-term deal with Javelin Global Commodities to handle hundreds of thousands of tonnes of imported coal for use in the power generating sector.

RBT has also agreed a multi-year contract to handle large quantities of granulated blast furnace slag for construction materials supplier Hanson. The steel-making by-product is ground into a fine powder for use as a cement replacement in ready-mixed concrete.

The deals are among a number RBT has secured in recent months and they come as the terminal continues its growth following the investment by British Steel which secured a 50% stake in the business earlier this year.

The terminal had previously been used as an import facility for iron and coal before the collapse of SSI in October 2015. However, RBT continued to operate and has now started to show marked growth as it handles and stores a wide range of cargoes such as coal, pet coke, granulated blast furnace slag, aggregates and scrap.

RBT General Manager Garry O'Malley said: "The transformation of this business is remarkable, underlined by our fine start to the year and the number of new contracts we've secured.

"Through the dedication of our

employees, and the strong customer partnerships we've developed, the business is growing significantly and starting to realize some of its undoubted potential.

"It's exciting to know this is just the start for Redcar Bulk Terminal and there's great scope to increase our customer-base, shipments and capabilities."

A total of 79 people are employed at the terminal, which operates a 320 metre long quay capable of accommodating vessels up to 17m draught.

And O'Malley said: "We're delighted to be working with businesses like Javelin Global Commodities and Hanson as together we feel we can have a positive impact, not only on the Teesside economy but the wider economy of the North of England.

"Strong partnerships like those we enjoy with Javelin Global Commodities and Hanson give me every confidence we'll continue to attract more new customers and become the bulk terminal of choice for importers and exporters alike."

British Steel's CEO, Peter Bernscher, said: "We've been greatly impressed by the team at Redcar Bulk Terminal and the results they're now delivering.

"I'd like to thank them for their efforts thus far and I've great confidence in their ability to continue growing the business."

Javelin Global Commodities CEO, Peter Bradley said: "We are delighted to be able to continue to support the turnaround at RBT. The partnership of Javelin and RBT going forward will play a key role in coal

imports to the power generation and cement industry in the UK in their need for low cost, flexible quality and quantity fuel supply arrangements."

Hanson's communications director David Weeks said: "Following the closure of the SSI works we now rely solely on imported slag to feed our Teesport grinding plant. The relationship with RBT will be critical to our business in the future."

ABOUT REDCAR BULK TERMINAL

Redcar Bulk Terminal Limited (RBT) is situated on the South Bank of the River Tees on the North East coast of the United Kingdom.

The terminal is a member of the Association of Bulk Terminal Operators.

RBT operates a 320-metre-long quay which can accommodate vessels up to 17 metres draught and is equipped with two ship-unloaders which can operate on grab or hook for bulk or conventional cargoes respectively.

It is HMRC-approved for the storage of un-cleared goods and enjoys direct rail access to the National Rail Network along with excellent road links to both the A19 and A1(M) roadways.

The facility operates 24 hours a day all year round and the terminal is equipped to handle rail traffic with separate wagon load and offload bulk handling equipment.

Key imports include coal, petroleum coke, granulated slag and aggregates while key exports include metallurgical coke and furnace-ready scrap.

Cochin to add floating cement terminal

Gujarat-based Sanghi Cements has indicated a willingness to establish a floating cement terminal at the Indian port of Cochin. This will help expand its coastal movements to South Indian markets.

The offshore terminal will consist of an anchored vessel with a bagging installation on board. Not only will it be able to mix the raw material in the vessel itself, but thereafter bag it.

At present, cement production consists of importing clinker and mixing it at shore-based plants in the ports.

The floating solution will be significantly cheaper than establishing a land-based terminal. According to Sanghi Cements, the business will generate around 300,000 tonnes of cement annually at the port.

At present, Cochin handles annual traffic of around 25.01mt (million tonnes), although is engineered to handle up to 74.6mt.

According to the port's deputy chairman, AV Ramana, once the project becomes operational, Cochin Port will be the first major port in India to have a floating cement terminal. However, Sanghi Cements has similar facilities at the minor ports of Kutch and Navlakhi.

The deputy chairman also revealed that the port is in the process of commissioning more automated cement bagging units. Three are currently operated respectively by Ambuja, Ultra-Tech and Zuari Cements, while Penna hopes to go live by November this year and Malabar Cements by March 2019. Combined, the five terminals will have an annual capacity in the region of 3mt.

Cochin is also seeking to increase the coastal movement of steel, which could mean imports of 500,000 tonnes by 2022. Rashtriya Ispat Nigam Ltd could well bring steel materials from Vizag to Cochin to service the states of Kerala, Western Tamil Nadu and South Karnataka.

As of October, this traffic was expected to amount to 4,000 tonnes per month.

Barry Cross

King's Lynn inaugurates new bulk store terminal

A new bulk store terminal has been inaugurated at the UK's Port of King's Lynn at a cost of £2.2 million. The new terminal, which was built on behalf of Associated British Ports (ABP), forms part of a rolling programme of infrastructure upgrades at the port.

The facility contains four bays: St Edmund's Bay, True's Bay, Savages Carousel and Howard's Bay, the latter named after a deceased ABP employee Michael Howard, who passed away in 2008. The new warehouse can store both grain and other

agribulks, enabling different cargo areas to be re-organized.

The new facility is also fitted with solar panels, which aim to make port operations more sustainable.

In total, ABP is investing £3.3m investment in the port, which also includes the purchase of a new crane.

Sir Henry Bellingham, MP for North West Norfolk, said: "The very substantial investment by APB in this state of the art bulk terminal is the latest in a programme of new builds and upgrades at Lynn docks

over the past four years. This really does underline ABP's commitment to both West Norfolk and this wider region as we play our part in boosting Britain's trade."

Andrew Harston, Short Sea Ports Director, said: "Constructing new facilities in a way that minimizes their impact on the environment is important to us. That is why the new terminal is equipped with solar panels to provide a clean energy generating capacity and the latest generation of energy efficient lighting systems within the facility itself." *BC*

Port inks lease with International Raw Materials

In mid-October this year, the Port of Longview Board of Commissioners entered into an agreement with International Raw Materials (IRM) to lease the Port's Bridgeview Terminal. IRM previously operated at the port from 1981–2001.

IRM, headquartered in Philadelphia, PA, proposes maximizing throughput of existing terminal infrastructure — focusing primarily on the export of bulk minerals, fertilizers and grains. While it operates several West Coast facilities, IRM plans to make Longview its flagship location for dry-bulk cargo exports.

"IRM appreciates the opportunity to

return to a Port and a community that played a significant role in our company's history and intends to grow and sustain commodity volumes through the facility and increase job frequency and revenue," said IRM Vice President Tim Mahoney. "We have immediate intentions to improve existing components of the bulk loadout facility, while working to expand the on-site rail footprint."

In April of 2016, the Board of Commissioners adopted the Strategic Business Plan as a roadmap to generate jobs and economic growth for our region. By signing with IRM, the port is working in fulfillment of its goal to

maximize use of under-utilized assets, as identified in the Plan.

"Based on their previous operating record at the Port, I'm confident IRM will successfully operate Bridgeview Terminal," said Commission President Doug Averett. "I'm looking forward to a long-term partnership that will bring additional economic vitality to our region."

The port sought a new operating tenant for Bridgeview following the expiration of its contract with Kinder Morgan. This included issuing both a Request for Interest and for Proposal to ensure maximized use of the terminal.

Keeping bulk at the forefront in France and Belgium



Jay Venter

De Keyser Thornton Group: quality ship agency services in all major Belgian ports

De Keyser Thornton Group, affiliate of NAXCO GROUP, was founded in 1853 and is the oldest and largest privately owned agency. Its head office is located in Antwerp and the agency covers all major ports in Belgium.

Belgium is situated in the west of Europe, bordered to the north by the Netherlands, to the east by Germany and the Grand Duchy of Luxembourg and to the south and the west by France. Although its surface area of 30,528km² makes it a small country, its location has made it a key entrance for Europe. Antwerp port has become one of Europe's largest sea ports.

GLOBAL SERVICES

De Keyser Thornton will be very happy to assist customers with the following matters:

- ❖ pro forma D/A;
- ❖ stevedoring rates for both import and export for all commodities;
- ❖ recommendation of ship chandlers, sludge removal and other suppliers;
- ❖ pilots, tugs;
- ❖ port duties;
- ❖ medical care for crew members;
- ❖ immigration, transport to and from the airport and to and from the vessel;
- ❖ full assistance during control by port state control and certificates renewal;

- ❖ ship repairs; and
- ❖ advice about port regulations (vessel, cargo or crew related).

SPECIFIC BULK SERVICES

De Keyser Thornton has several bulk vessels for its main client, carrying fertilizers, in port every day, year round. These vessels often exchange place at the same berths, directly physically linked to the loading and storage facilities — really adhering to the just-in-time principle.

De Keyser Thornton co-ordinates pilots, tugs, locks, stevedores, all in perspective of 24/7 operations of the fertilizer plant. Vessels are loaded either

with loading arms (majority) or grabs.

Next to its fertilizers, De Keyser Thornton services malt vessels on a monthly basis and several steel vessels per month.

Due to the nature of trade in which one of its principals is excelling De Keyser Thornton is a specialist in IMO 1, military and strategical cargoes. The company has all the permits, relations and expertise to handle these operations and port calls in the smoothest possible way. It has a dedicated husbandry team, 24/7 and is available for reporting/boarding/ interventions at all times. Furthermore, De Keyser Thornton offers experience, knowledge, long-lasting relations within the port and up-to-date IT support, which translates into cost and time efficient passage of the vessel in port.

BULK CARRIERS

The dedicated team of DKT services bulk vessels for several owners, operators, cargo owners and traders in the port of Antwerp.

It handles approximately 400 bulk vessels per year and deals with the following commodities: grains, metals,



fertilizers, project cargoes, and so forth.

CLIENTS

DKT serves the in-house lines (Empros, UAL, Bahri, SCI), together with owners, brokers, forwarders – charterers, producers & traders.

Due to its wide scope of activities and types of vessels, De Keyser Thornton actually targets all owners or stakeholders interested in a swift and economical handling of their vessel in Antwerp.

Destination or origin are irrelevant to DKT, its field of expertise is the port of Antwerp, where it contributes to schedule integrity of the vessels and profitability of all voyages starting, ending or transiting its home port.

PARTNERSHIPS

As a member of Naxco Port Agency Network, De Keyser Thornton is regularly audited to ensure that the highest service standards in the industry are achieved.

Euroports loads, for export, a vessel with the deepest draught of any that have docked at its Terminal 1207

Euroports, has just completed a major job for a number of its key customers in Antwerp, loading to capacity the *Salta*, GMB Maritime Liner Services GmbH, at its Terminal 1207 at the Left Bank in Antwerp.

At the terminal, which has a storage capacity of 1mt (million tonnes), Euroports handles a large range of cargo types, from paper products to steel and other metals, wind turbines, and fruit. The challenge this time was to load all the cargo onto the *Salta* in time for its scheduled departure date, 25 September.

“This vessel has the largest draught of any that Euroports has ever loaded at this terminal”, said Joeri Tielemans, the company’s Commercial Director for Belgium and France. “That’s thanks to the new 18-metre-deep lock here in Antwerp, which we’re really delighted with, because it gives our customers so much more flexibility.”

The loading operation passed off without any problems: when the *Salta* weighed anchor, bound for various ports in the Middle East and the Far East, it was at its maximum draught of 13.9m — full and down. That meant it was carrying 53,000 tonnes of cargo, with a total volume of 64,000m³. The cargo included 30,000 tonnes of steel slabs, loaded at ZN, 8,000 tonnes of steel coils, 20,000m³ of cast-iron pipes, 6,000 tonnes of pulp in bales and reels and a few smaller shipments of steel.

Michael Koch, Managing Director at GMB, was pleased, but hardly surprised, that everything went as planned: “This was a big job, with a diverse cargo, but we knew we were in good hands with Euroports: over the years, they’ve built up a solid track record, safely and efficiently loading an enormous variety of goods bound for destinations across the globe.”

Joeri Tielemans of Euroports sees the partnership with GMB blossoming in the future. “Our customers know we will handle their cargo expertly at port, and that it’s in safe hands once it’s aboard GMB’s ships. We think we make a great team, so we’re looking forward to strengthening our relationship with GMB in the months and years ahead.”

ABOUT EUROPORTS

One of the largest port infrastructure companies in Europe, Euroports develops, operates and manages global maritime supply-chain solutions for numerous international customers in various industry sectors. Each year it handles more than 50mt of bulk, breakbulk, liquid and containerized goods. The company’s mission is to be the partner of choice in delivering the highest-quality solutions to customers in its target industry sectors.

Agena Tramp appointed by ArcelorMittal Logistics as port agent in Fos-sur-Mer



ArcelorMittal Logistics chose Agena Tramp as its port agent in Fos-sur-Mer.

Agena Tramp has extended its co-operation with ArcelorMittal Logistics this year: ArcelorMittal Logistics has appointed the company as agent in Fos-sur-Mer, South of France. Agena Tramp already is one of its port agents in Dunkirk. This expansion increases the volume of vessels handled by year. In total, it handles around 600+ calls a year just for ArcelorMittal Logistics. ArcelorMittal imports iron ore and coal and exports steel products all over the world. Fos-sur-Mer is its second-largest steel plant in France. Its business operations extend from the mining of iron ore and coal to the production of the full range of steel products and services.

Agena Tramp is an affiliate of NAXCO GROUP, which celebrates its 50th anniversary in 2017. The Group is a key international player in the shipping industry and provides shipping, forwarding and logistics, NVOCC and port and marine services. NAXCO's headquarters are based in Paris and there are 40 proprietary offices worldwide.

ABOUT AGENA TRAMP

From its origins as a local company in 1972, AGENA TRAMP has grown to become a recognized French ship agency for all types of vessels.

The first years were dedicated to liner activities with first class ship owners showing confidence in the company's pioneer port agents whose professionalism and dedication were recognized in the market. Today Agena Tramp's marine services therefore cover a wide range of countries through its own network. Agena Tramp is a member of two international networks: Multiport and Naxco Port Agency, so it can provide its services worldwide.

Agena Tramp's philosophy is to serve the shipping industry through dedication, professionalism, independence, loyalty and expertise. With headquarters located in Le Havre and offices in Dunkirk, Montoir de Bretagne, Paris, Bordeaux, Marseilles and Fos-sur-Mer, Agena Tramp's covers all of France: from the north to the Mediterranean, including the Atlantic. Its employees throughout France provide port and marine services.

SERVICES

The shipping agent is the essential link in the International Maritime transport chain.

Agena Tramp's teams, available 24/7, manage all aspects of port agency and marine services: cargo clearance; cash to master; crew change; dry-dock and repair supervision; husbandry; offshore support; port agent for ship-owners, operators, charterers and traders; port information; project cargo and any handling; protective agent; ship agent; ship supply; spare parts delivery; stevedoring; survey.

COMMODITIES

Agena Tramp offers maritime services for a diverse range of vessel segments. In 2017:

- ❖ 60% of the company's business was related to dry bulk activity: grain, ore, coal, steel, fertilizer.
- ❖ 40% was shared between liner and cruise, liquid and heavy lift/project cargoes.
- ❖ Dry bulk is Agena Tramp's main activity. It is largely involved in wheat, iron ore, sunflower pellets, soybean meal pellets and coal, but also handles all types of dry bulk cargoes

BULK ACTIVITY

Agena Tramp has developed experience and know-how in the handling of dry bulk carriers in all important ports located in France. It offers great expertise and experience for cargoes requiring special attention during loading, transportation and discharge.

SERVICES:

- ❖ line-up sent on regular basis;
- ❖ regular reports on activities during loading and discharging;
- ❖ strict control of the stevedores;
- ❖ strong local expertise;
- ❖ solid relations with services providers and port authority;
- ❖ 24-hour service; and
- ❖ cost control and quick dispatch of the DA.

MAJOR CLIENTS

Agena Tramp represents ship owners and charterers. Its customers in the dry bulk industry are: grain traders, mineral importers and exporters, coal importers, steel producers and fertilizer producers. From small to big companies, Agena Tramp can respond quickly and reliably to their requests. It is able to satisfy customer demands from every part of the world.

MAJOR COMPETITORS

Dry bulk is a competitive sector and Agena Tramp competes with local as well as global companies. With its own offices and employees based at major sea and river ports, Agena Tramp is one step ahead in terms of services and responsiveness. The company believes its reputation, experience, connection and a national presence is what sets it apart from other companies in the sector.





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Efficiency, Quality, Reliability,
Quality, Reliability, Efficiency...* 😊

HAROPA strengthens its leadership in fertilizer trade

HAROPA has reconfirmed its position as the top French port for handling fertilizers. Trades reached a total of 2.21mt (million tonnes) in the course of 2016 and, during recent months, several events have taken place which have strengthened the position of HAROPA – Port of Rouen.

In September 2017, Borealis group and HAROPA – Port of Rouen inaugurated the refurbished 'Quai de Grand-Quevilly'. This upgraded facility will increase exports of dry fertilizers from Rouen by accommodating larger vessels. "The Quai de Grand-Quevilly will enable us to increase our export sales and thus meet the requirements and expectations of our French and international customers in a better way," Markku Korvenranta, Executive Vice-President of the trade of base chemicals at Borealis, said on the occasion.

A NEW PLANT IN ROUEN

The month of September also saw the coming-on-stream of the new plant of the Belgian group Tessenlo in Rouen. The plant started to produce the Thio-Sul® (ammonium thiosulphate), a liquid nitrogenous sulphur fertilizer for large-scale farming, tree cultivation and market gardening, in September 2017. Built within Borealis site in Grand-Quevilly near Rouen, the plant is the first European unit of the group.

"We have succeeded in starting our new plant one year only after the beginning of the construction work. We are still extending our presence on the market of liquid fertilizer solutions for precision crop management. The plant which employs about 20 staff serves the European and



The Quai de Grand-Quevilly at the Port of Rouen (photo: J.F. Damois).

world markets", Geert Gyselinck, Business Unit Director Tessenlo Kerley International, explained.

RECOGNIZED EXPERTISE IN THE TRADE

In addition to the industrial equipment, the HAROPA fertilizer hub in Rouen is equipped with modern facilities that make it possible to receive, store, mix, bag and ship any type of fertilizers. Bolloré Ports, Cap Invest, Euraports, Sea Invest and Surveyfert operators for dry fertilizers and Rubis Terminal and SeaTank for liquid fertilizers have facilities dedicated to the trade and offer importers, producers and traders competitive expertise and service.

This leading position is lastly illustrated by the launching of the first futures market contract for nitrogenous fertilizers by the Euronext group in November 2016, the delivery point being at the independent stockist Rubis terminal set up

in the Port of Rouen.

As a major stakeholder in the development and protection of the Seine estuary, HAROPA – Port of Rouen, a West-European port for grain export, accommodates 3,000 vessels and 6,000 river convoys every year, which generate traffic of 27 to 30mt. In the heart of the HAROPA complex, Rouen bases its uniqueness on the capacity to handle all types of traffic, notably industrial trades, through the expertise of its operators and the diversity of its terminals which stretch from Honfleur to the Rouen Normandy Metropolis.

ABOUT HAROPA

HAROPA, the fifth-largest port complex in Northern Europe, is a joint venture between the ports of Le Havre, Rouen and Paris. It is connected to every continent owing to a first-rate international shipping offer (linking around 700 ports worldwide). It serves a vast hinterland the centre of which is in the Seine valley and the Paris region forming the biggest French consumer market area. With around ten Normandy and Paris area partner ports, the 'one-stop' hub now forms in France a global transport and logistics system, capable of providing a comprehensive end-to-end service. HAROPA handles over 120mt of cargo by sea and waterway each year. HAROPA business represents 160,000 jobs.



Aerial view of the Quai de Grand-Quevilly (photo: J. Refuvielle).

Axereal raises €150m to develop its malting and food processing business



Axereal Group, a major European cereal collector and the world's fifth-largest maltster, announced on 5 July 2017 that it had raised €150m to finance its growth projects. To raise these funds, two financial investors, Temasek and Unigrains, and minority shareholder Tereos subscribed to a capital increase of the group's malting subsidiary.

This growth primarily concerns the Group's malting business unit. Axereal subsidiary Boortmalt's strategy is to support its brewer and distiller customers as they grow, by increasing its production capacities, boosting volumes

exported from Antwerp and becoming directly involved in producing barley and malts in fast-growing geographies such as Africa and Asia.

"The involvement of investors focused on emerging markets will be a concrete advantage as we take our growth projects forward. Singapore-headquartered Temasek, and Unigrains, specialized in the agri-food sector, bring proven expertise on the valorization of our malt business and in accessing international markets, most notably in Asia" said Boortmalt CEO Yvan Schaeplan.

"Our aim is to reinforce our cooperative Group, which is made up of two pillars, agriculture and food processing, by further adding value through downstream processing activities. Axereal can now pursue its growth targets and continue to offer its co-operative members a secure and efficient service, without losing its place as majority shareholder. By investing in food processing, we are both ensuring access to the cereals and barley market for our members and creating value," said Axereal Chairman Jean-François Loiseau.

GAC acquires Ahlers agency arm in Belgium

GAC has expanded its operational footprint in Belgium by acquiring the port agency business of Ahlers Belgium NV.

Ivo Verheyen, the GAC Group's Vice President – Europe, says: "The GAC family in Belgium, throughout Europe and around the world welcomes the Ahlers Belgium agency team aboard. With them, we look forward to expanding our services in and around the Amsterdam–Rotterdam–

Antwerp (ARA) region.

"For the last three years, GAC Belgium has specialized in agency and dry bulk services at all of the country's ports. With our new colleagues, we are determined to continue to deliver the highest levels of service and local knowledge that our clients can rely on."

Roel Vanmaele, Managing Director of Ahlers Belgium NV, adds: "This transfer is

part of a drive to sharpen Ahlers' focus on supply chain management and logistics. With its global network and local relationships, GAC is extremely well positioned to serve the port agency business in Antwerp. Our two companies have worked successfully and productively together for a number of years and will continue to do so in areas of joint interest."

Cavotec reels set to power major Australian coal handling application

Global engineering group Cavotec is supplying an advanced cable reel system and a hose reel unit for installation on a FAM stacker/reclaimer that will be used at the Abbot Point coal terminal in Queensland, Australia, one of the country's largest coal handling facilities.

The stacker reclaimer will be the fifth such machine at the terminal, and will have a stacking capacity of some 6,000tph (tonnes per hour), and an impressive reclaiming capacity of 8,000tph.

Cavotec and FAM have a long-established relationship and often work closely on bulk handling projects all over the world. According to Cavotec, the customer valued the group's local presence in Australia, enabling it to provide timely service and maintenance.

To meet specific customer requirements for this order, which was placed in April 2016, Cavotec Australia designed and manufactured the cable reel and hose reel systems with cylindrical drum bodies that withstand the harsh operating environments of large-scale bulk handling applications, while maintaining high levels of operational efficiency.

Cavotec is a global engineering group that manufactures power transmission, distribution and control technologies that form the link between fixed and mobile equipment in the ports & maritime and airports & industry sectors.



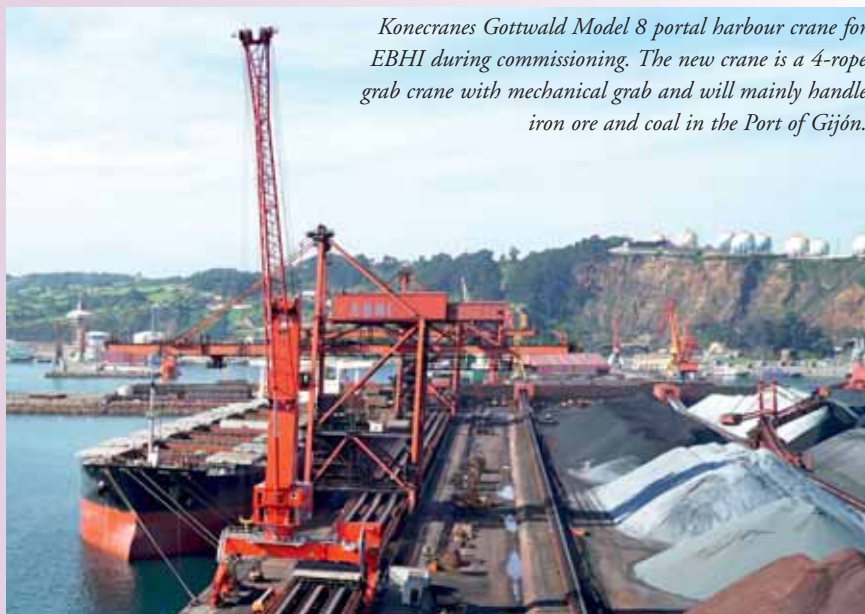
Konecranes delivers portal harbour crane to Spain

On 16 October, 2017, the Spanish bulk terminal operator European Bulk Handling Installation (EBHI) in the port of Gijón put a Konecranes Gottwald Model 8 portal harbour crane into service. The crane, originally ordered in October 2016, will mainly be used for iron ore and coal unloading. This is the first portal harbour crane delivered by Konecranes to Spain.

The new machine is the first Konecranes Gottwald portal harbour crane purchased by EBHI. It will help the terminal to continue increasing its handling volume.

José Manuel del Arco, Managing Director, EBHI said: "Our handling rates have increased sustainably in the past few years. To serve this increasing demand over the long-term, we are now opting for bulk handling technology from Konecranes. We were particularly impressed by the short delivery lead-time for the crane, the high handling rates and the very eco-efficient electric drive system, which uses power from our terminal's mains supply."

Giuseppe Di Lisa, Sales and Marketing Director, Mobile Harbor Cranes, Konecranes: "Our business in Spain is developing very well these days. We are proud that EBHI, another leading terminal, has decided to adopt our portal harbour crane technology. Around fifty examples of this technology are working around the world in large bulk terminals that supply



Konecranes Gottwald Model 8 portal harbour crane for EBHI during commissioning. The new crane is a 4-rope grab crane with mechanical grab and will mainly handle iron ore and coal in the Port of Gijón.

raw materials to power stations and feedstock to industrial plants."

Konecranes Gottwald portal harbour cranes bring together field-proven mobile harbour crane technology and portal designs. The machines are particularly suitable for integration in the complex infrastructures of bulk terminals. The new Konecranes Gottwald portal harbour crane for EBHI, a Model 8 crane in a four-rope-grab variant, offers a maximum lifting capacity of 100 tonnes with a powerful 63-tonne grab curve and an operating radius

of up to 50m. The portal has a track gauge of 22m and a clearance height of 6.125m.

Konecranes is a group of Lifting Businesses™, serving a broad range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2016, group (comparable combined company) sales totalled €3,278 million. The group has 16,800 employees at 600 locations in 50 countries.



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ORTS GmbH



Alex Stewart International accredited to ISO standards

Alex Stewart International has announced to the industry that its head office and principal laboratories in Liverpool, England, United Kingdom — AS International Corporation Ltd — have been accredited by the United Kingdom Accreditation Service (UKAS) to ISO 17025 Standards.

The methods which have been accredited are as follows:

- ❖ Determination of Silver (Ag) in Copper Concentrates by Acid digestion;
- ❖ Determination of Cobalt (Co) in Cobalt Hydroxides and Carbonates;
- ❖ Determination of Cobalt (Co), Copper (Cu), Manganese (Mn) and Nickel (Ni) in Concentrates;
- ❖ Determination of Copper (Cu) in Concentrates Minerals and Ores by Electrolytic Deposition; and
- ❖ Determination of Copper (Cu) in Concentrates, Minerals and Ores by Potentiometric Titration.

Alex Stewart's experienced laboratory technicians and chemists are highly trained to carry out qualitative and quantitative metal testing and analysis by traditional and modern instrumentation and by following internationally recognized methods and procedures for base metal ores and concentrates.

These include copper, lead, zinc, tin, iron, ferro alloys, cobalt, nickel, manganese and also precious metals such as gold, silver and platinum group metals. This is in order to ensure that its customers' contractual specifications are protected by providing fast and accurate results.

Other ISO-certified Alex Stewart International laboratories include: Alex Stewart Agriculture Ltd (UK); Alex Stewart International Argentina S.A.; Alex Stewart Assayers del Peru; Alex Stewart International Chile; Alex Stewart Environmental Laboratory Services Norway; Alex Stewart

Agriculture do Brasil; Alex Stewart Agriculture China; Alex Stewart International Dubai; Alex Stewart International Ukraine; Alex Stewart International India; Alex Stewart International Rwanda; and Alex Stewart International Zambia.

Alex Stewart Agriculture is a UKAS ISO/IEC 17025: 2005 accredited company providing world class FOSFA, GAFTA and UKAS-approved inspection and analysis services. It is supported by the A. Norman Tate, Huson and Hardwick and Food Test Laboratories for the facilitation of the international trading of soft commodities including animal feed, oilseeds, oils & fats, biomass, grains and cereals, fertilizers, raw and refined sugar, water, and also food products. Alex Stewart International and Alex Stewart Agriculture are fully committed to providing a world class reliable laboratory analysis service to all of their customers.

Third Dino for logistics service provider, Wessem

Logistics service provider Wessem Port Services Group in Stein, has bought its third Dino mobile bulk truck loader from Van Beek. There is a good reason for this, says Wessem's commercial director; Peter van Gemert. "We are very pleased with it, because of its flexibility, ease of cleaning, the relatively low investment and its value retention."

Wessem was founded in 1968, and its operational activities include transport, storage and trans-shipment and processing of dry bulk goods, such as powders and granules. The company serves the chemical industry, road/construction, recycling companies and the traditional manufacturing industry.

MORE FLEXIBILITY

Wessem started searching for a new loading method because its clients

began asking for greater flexibility in the storage and processing of dry bulk goods. "For example, they asked whether we could load the goods from big bags into silo trucks or vice versa", says Van Gemert. "This is something we must be able to respond to satisfactorily, which we can now do with the Dino."

Loading was previously done using only self-built systems. "But, they were not mobile, harder to clean and needed a lot of maintenance. Because we anticipated a strong growth in our clients' needs, we decided to look for a specialist in this field".

DINO MEETS ALL REQUIREMENTS

At the time, Wessem Port Services had compiled a comprehensive list of requirements, which still applies. "The system had to be mobile, because we have a variety of bulk goods over several warehouses in our dock areas. This also meant that we needed a system that was easy to clean, so that it could be quickly deployed for a different product, without the risk of contamination between products.

Furthermore, the loading speed had to

be at least the same or greater than 50m³/h, which is what most fixed systems can achieve. The Dino was the only system that met all these requirements".

PERIPHERALS

An important additional benefit of the Dino for Van Gemert is that peripherals can be added, such as dust extraction, shoot, grid, stairs or a break screw. "This allows it to be used for a range of activities".

ONE, TWO, THREE

Wessem bought its first Dino in 2011. The second followed more than a year later and now, after a few years, the company has gone on to purchase its third Dino. The company is using the third Dino specifically for fertilizer, the other two load a variety of mineral products. "The ease with which these machines can be cleaned is a huge advantage to us. We can quickly expose the screw and clean it with air or water".

Every one of the Dinosaurs now loads multiple cargoes daily. "A Dino is a very good investment for us when you see what it can do", continues Van Gemert. "To keep pace with the developments regarding our company growth, we expect to further increase the number of Dinosaurs at our site."



Continental acquires South African tech company to further develop its services for the conveyor industry

- ❖ Strengthen sensor expertise for permanent and predictive maintenance competence;
- ❖ Basic foundation for offering new services to current and new customers;
- ❖ Hardware and software knowhow for early detecting damages in conveyor belts; and
- ❖ Dedicated and experienced team to be welcomed in the group

The technology company Continental has recently acquired Advanced Imaging Technologies (PTY) Ltd., based in Pinetown, South Africa, which is known for its fundamental work for x-ray and magnetic imaging-based systems used for early detecting damages in fabric and steel cord conveyor belts.

“With this acquisition we added technical sensing knowledge and R&D competence to strengthen our competence in the area of predictive maintenance. At the same time it is a strategic cornerstone to enlarge our service capabilities in industries such as mining,” stated Hans-Jürgen Duensing, who is responsible for the ContiTech division on the Continental Executive Board.

Advanced Imaging Technologies (Pty) Ltd was founded in 2004 to provide scientific consulting services to South African industry and commerce, both in the private and public sectors. The

company has specialized in developing innovative and cost-effective solutions to scientific and technical challenges experienced by large and small-scale industry and commerce. It was agreed that the purchase price would not be disclosed.

Conveyor belts keep the globalized cycle of mining and industry moving. “If a belt system experiences an extended downtime, the entire production chain often collapses, intensive maintenance and often repair work is required. Monitoring systems help our customers to detect damages early and thereby reduce downtimes and save maintenance costs,” explained Hannes Friederichsen, head of the business unit Conveyor Belt Group.

Advanced Imaging Technologies (Pty) Ltd. offers a wide variety of scientific and technical skills and expertise in the areas of image and signal processing, hardware and software development, advanced data analysis, x-ray imaging, embedded systems and system integration. “From the data obtained by the monitoring systems, our customers can benefit from innovative service offers,” said Friederichsen and added: “In the last years, Dr. Michael J. Alport and his dedicated and experienced seven-employee strong team did an excellent job. We are very pleased to welcome them to our family.”

PREDICTIVE MAINTENANCE: AVOIDING DOWNTIME AND SECURITY AROUND THE CLOCK

Up until now, technicians have had to inspect an individual conveyor belt while it is stationary or running at a reduced operating speed. The advantage of permanently installed monitoring systems is that damages to conveyor belts can be detected early, whilst the system is running, and hence be repaired in good time. This leads to operators benefitting from less time consuming and less expensive downtimes.

The technology developed by Advanced Imaging Technologies for international bulk-handling market uses innovative magnetic sensing technology which has been validated by extensive x-ray imaging measurements. It provides continuous online condition monitoring of steel cord-reinforced conveyor belting and reduces the risk of belt failure by providing data that is used for timely planned maintenance, thus reducing costly downtime. This technology provides a high resolution, easy-to-interpret, magnetic image of damaged or broken steel cords for the verification of potential alarm conditions. At the same time, it gives operators real-time web interactive access to review the damage locations and their severity. In addition, the splice integrity and damage severity can be monitored over time so enabling a comparison with the historical data.

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Dinnissen Process Technology wins ISO certification

Dinnissen Process Technology specializes in the handling and processing of bulk materials. It offers complete processes for the milling, sieving, weighing, mixing, dosing, drying, expanding, extruding, vacuum coating, packaging and transporting of powders, grains and granulates.

ISO CERTIFICATION

Within the markets where Dinnissen operates, customers place high demands on process and technology knowhow and applied solutions. Dinnissen plays a leading role here as a supplier and sets itself goals to safeguard this position. In addition to continuously innovating customer-centred products and solutions, Dinnissen has worked hard in recent months and achieved its goal of full ISO 9001:2015, ISO 14001:2015 and ISO 27001:2013 certification.

QUALITY

“As an organization we’ve shown continued steady growth for years,” says Operational Director Wouter Kuijpers. “This has convinced us that our success has resulted from customer focus, ongoing innovation and striving for quality.” Among other things, this comes from the long-standing relationships that Dinnissen maintains with its customers. In the past, there were various reasons for not deciding to go for ISO 9001 certification. However, owing to the standard’s new ‘High Level Structure’ (HLS), now is the moment to demonstrate that the processes within Dinnissen meet the requirements of ISO 9001:2015. For existing and future customers, this certification will endorse the fact that quality and continuous innovation are fundamental to Dinnissen’s DNA.

ENVIRONMENT

Dinnissen’s environmental management system is an important tool for formalizing principles and monitoring progress. This way of working should lead to the



organization being raised to a higher level in the environmental field. Dinnissen sets a high priority on the environment. This is evidenced, *inter alia*, by the fact that an environmental management system has been set up in accordance with the requirements of the ISO 14001 standard. However, managing environmental risks and reducing environmental impact are not separate tasks; they form part of Dinnissen’s day-to-day operations. This is why environmental management is integrated within the ‘High Level Structure’ quality management system.

INFORMATION SECURITY

The general sharing of information is playing an increasingly important role in today’s society. The expectations within Dinnissen are that information security will therefore become an increasingly important aspect, not only for society but also for business operations. The management of Dinnissen has chosen not to wait until it is forced to take measures by the market but to react pro-actively. “In order to demonstrate to stake holders such as customers, suppliers and employees that we take this very seriously, we have

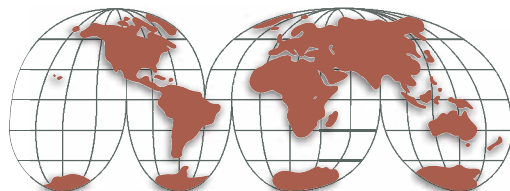
certified our information security management system in accordance with the requirements of ISO 27001: 2013,” says Wouter Kuijpers.

Obviously, the Dinnissen organization must continuously comply with statutory requirements, covenants and guidelines in the area of quality, environment and information security. However, Dinnissen goes one step further. “As an organization we want to be and remain a reliable partner for all stake holders. The ISO certification will contribute to this end,” states Wouter Kuijpers.

ABOUT DINNISSEN

Dinnissen Process Technology operates internationally with 180 employees and has 70 years’ experience in bulk materials technology, machine development, processing, engineering, control, automation and service. It strives for innovation and market development, aimed at developing (custom-made) products for its customers. Production is under its own management. Improving ergonomics, efficiency and hygiene play a key role in this. Dinnissen is active in the chemical, pharmaceutical, food, pet food, feed and aqua feed industry.





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Conveyor systems tracking technology

DATA POINTS FOR SAFER, MORE DEPENDABLE OPERATION

As bulk handling equipment suppliers continue to make use of new and evolving technologies to develop 'smarter' conveyor systems, a major global manufacturer has introduced data tracking with QR codes on its belt cleaners and other components. Customers benefit from regularly-scheduled inspections by factory-trained and MSHA-certified technicians, providing operators with easy access to a wealth of data on the application, operating environment, service life and condition of conveyor components, updated on every belt cleaner maintenance visit. By avoiding the common 'run it until it breaks' approach to conveyor maintenance, a Martin Engineering proprietary smart phone app gives technicians and customers a tool that helps maximize performance and service life — while minimizing carryback and spillage — to improve safety and reduce unscheduled downtime.

Currently being implemented in select markets around the world, the new tracking programme captures a wide array of information to create a detailed record on all components. Date codes are imprinted on the blades during manufacture — very important for urethane because it has a limited shelf life — and technicians also affix tags on existing equipment to begin monitoring condition and recording observations.

Conceived as part of Martin Engineering's factory-direct 'Mr. Blade' programme, technicians perform regularly-scheduled inspections and adjustments, with an 18-point operational assessment from head pulley to tail pulley and a report for each visit. The visual inspections include the condition of pulleys, belts and idlers, as well as belt tracking, sealing, support and containment. This constant vigilance contributes to greater safety, efficiency and dependability of the conveyor systems, minimizing hazards and unplanned outages.

"Periodic reviews often reveal developing problems before they become a failure, such as worn idlers, leaking seals or excessive spillage," explained Chris Schmelzer, Director of the Wear Components Business Group for Martin Engineering.

"The data tracking programme will help us work with our customers to make better-informed decisions about what equipment to use in specific applications, more accurately predicting the expected wear life," said Schmelzer. "The goal is to



Martin Engineering has introduced data tracking & analysis codes on conveyor belt cleaners.

help ensure that all components are properly serviced and replaced during scheduled outages, before a major breakdown occurs and stops production."

With the new tagging and capture ability, component data can be recorded and analysed in much greater detail than ever before. Every inspection a technician makes will be logged in, along with operational factors such as the material being handled, conveyor speed and remaining wear life, as well as visual observations and other info. The overall goal is to deliver more effective control of bulk material, improving predictive maintenance scheduling and contributing to a lower total cost of ownership.

The tagging programme allows the company to maintain detailed information about the product's date of manufacture, installation and service history, giving customers access to the data through a smart phone or other device. "Eventually we will have enough data points to make more accurate predictions about the

performance and wear life of individual blade designs and materials of construction under specific operating conditions," Schmelzer said. "Defining average wear life is extremely difficult because of the number of variables, but having this information will allow us to compare blade performance in similar applications and come up with a range and standard deviation."

Data tracking and analysis have been in use by manufacturers of sophisticated equipment for several years, but the new programme developed by Martin Engineering is believed to be the first of its kind for conveyor components. The company already has plans to expand the asset tagging programme to its air cannons and other equipment over time.

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 (available free online) is an internationally-recognized resource for safety, maintenance and operations training — with an estimated 10,000 copies in circulation around the world — and employees take an active part in ASME, SME, VDI, CMA and CEMA. The company also 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, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK.



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Lumut Maritime Terminal to switch to Fuchs material handlers to boost operational efficiency



Lumut Maritime Terminal SDN BHD will soon switch from a blend of modified excavators, wheel loaders and truck cranes to purpose-built Fuchs material handlers for vessel loading/ unloading, bulk material stockpiling and truck loading/ unloading. The seven-machine order that replaces all existing handling equipment at the terminal includes three electric Fuchs® RHL880 XL-Trac and four wheeled MHL350F material handlers. All Fuchs equipment is expected to be in operation at Lumut Port by mid-2018.

“In order for Lumut Port to be the most efficient terminal in the industry, we must use the most efficient equipment for loading/unloading operations of dry bulk, break bulk and liquid bulk goods,” says Mubarak Ali, CEO for Lumut Port. “We expect a 30% increase in material handling flow by switching to the purpose-built Fuchs material handlers,” says Mubarak.

Tasked with vessel loading/unloading, the Fuchs RHL880 XL-Trac handlers will be equipped with a 24m cranked boom to help reduce material handling time. The Fuchs Applications Center will

modify the machines to include an electric drive concept with 90m of cable and Fuchs Powerpack for efficient travel along the 180m length of the quay. With a 3.3m undercarriage height, the handlers are built with a 3.7m pylon riser to boost upper structure height to 7m. The hydraulically height adjustable cabin gives the operator a maximum 13m eye-level operation, and the cabin’s independent 2.2m forward movement delivers excellent visibility inside vessel.

Supporting port operations in the stockyard will be four 35-tonne class MHL350F handlers, offering a 16m reach to more efficiently stockpile bulk materials than the modified excavators and wheel loaders. The diesel driven units feature a mobile undercarriage with solid rubber tyres and quickly move around the stockyard at speeds reaching 20kmph.

The hydraulically height adjustable cabin offers an elevated eye level of 5.6 m, allowing the operators to see over the sides of high-wall trailers for more efficient loading/ unloading. An intelligent overload system allows the machines to work inside the warehouse facilities,

which have limited roof heights.

“We are excited to work with Lumut Maritime Terminal and honoured that they have selected Fuchs to equip the port facilities with modern, purpose-built material handlers to boost operating efficiencies,” says Andreas Gruber, business manager for Fuchs, a Terex brand.

“In addition to boosting material handling efficiency by 30%, we have calculated the machines will deliver Lumut Maritime up to a 70% fuel/energy savings compared to operating the modified excavators.”

ABOUT LUMUT MARITIME TERMINAL SDN BHD

A Royal Malaysian Customs Gazetted Port, Lumut Maritime Terminal is a river port located along the banks of the Dindings River. It is strategically located off the Straits of Malacca, on the west coast of Peninsular Malaysia, in Perak. The terminal is an integrated common user port facility accepting break bulk, dry bulk and liquid bulk cargo and is International Ship Port Security code compliant.

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Siwertell road-mobile 10000S.

Louise Dodds-Ely

Siwertell strengthens cement operations with repeat road-mobile unloader order

Siwertell, part of Cargotec, has received a repeat order from a company based in the Middle East region for a second 10 000 S Next Generation road-mobile unloader. The unit has been ordered in response to an expansion in white and grey cement operations and will support the company's existing road-mobile unloader. The order was booked in Cargotec's second quarter 2017 order intake.

The trailer-based, diesel-powered Siwertell 10 000 S Next Generation unit is fitted with dust filters and a double bellows discharge system, which allows for a rated unloading capacity of 300tph (tonnes per hour); an increase in through-ship capacity of up to 30% compared with a single loading bellows system.

"In the cement bulk handling business

Siwertell stands for reliability and therefore we believe that by choosing our units, the customer chooses the best tool in the business," says Jörgen Ojeda, Director, Siwertell Mobile Unloaders.

Siwertell's road-mobile unloaders are based on unique screw conveyor technology with totally-enclosed conveying lines for environmentally-friendly and cost-efficient operations. The unique screw conveying system ensures continuous high capacity operations and reduced unloading times. Siwertell's unloaders also achieve cost efficiency, consuming just 0.18 litres fuel/tonne during an average cement handling operation.

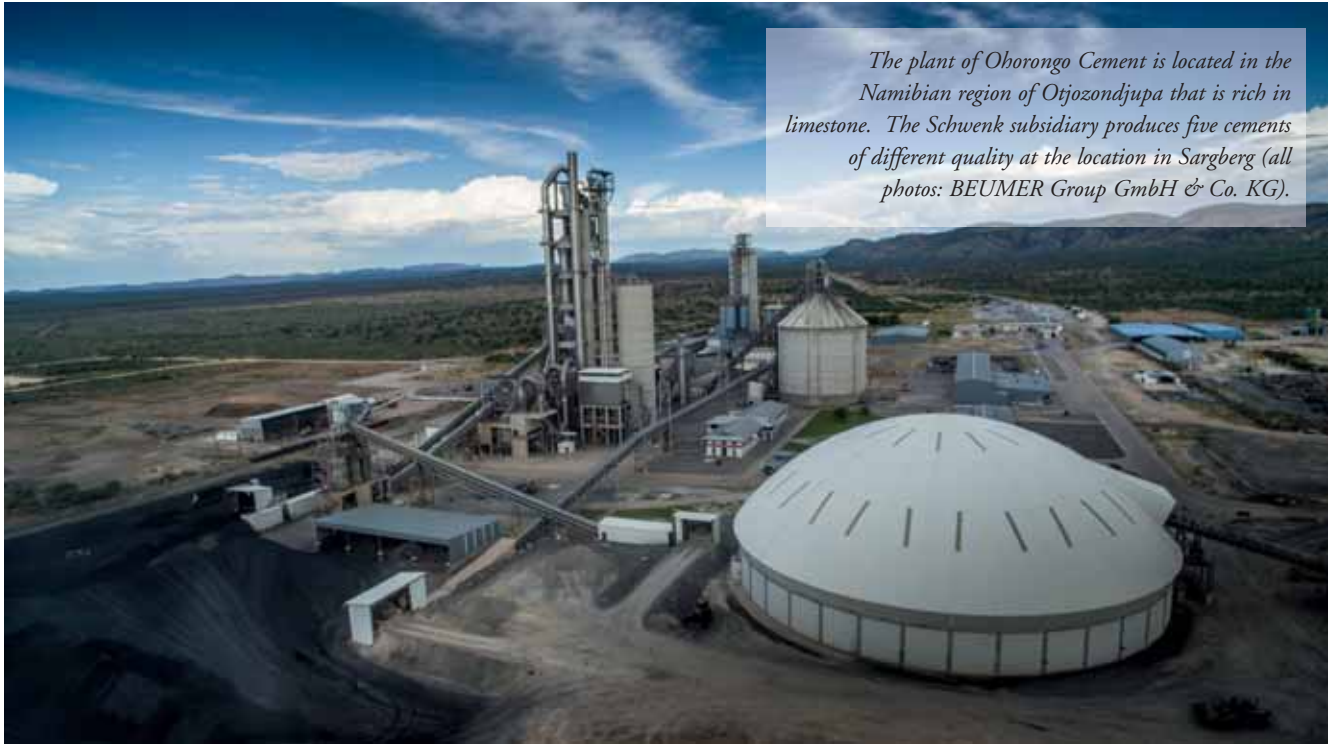
Available in three models — 5 000 S, 10 000 S and 15 000 S — the unloaders were originally developed to handle

cement, though they can comfortably handle a wide variety of dry bulk materials including: alumina, sulphur, grain, feedstuff, biomass and fertilizers.

ABOUT SIWERTELL

Siwertell ship unloaders and loaders are based on unique screw conveyor technology, in combination with belt conveyors and aeroslides, and can handle virtually any dry bulk cargo, such as alumina, biomass, cement, coal, fertilizers, grain and sulphur. Siwertell's product portfolio includes ship-unloaders, mobile ship unloaders, ship loaders, conveying systems and complete bulk terminal solutions, all of which are designed to ensure environmentally-friendly and efficient cargo operations.

Greater than the sum of its parts



The plant of Ohorongo Cement is located in the Namibian region of Otjozondjupa that is rich in limestone. The Schwenk subsidiary produces five cements of different quality at the location in Sargberg (all photos: BEUMER Group GmbH & Co. KG).

COUNTRYSIDE OHORONGO DECIDES ON THIRD PACKAGING LINE, SUPPLIED ENTIRELY BY BEUMER

Ohorongo Cement (PTY) Ltd., part of Schwenk Zement KG, is the only cement manufacturer in Namibia, Africa. Its mission is to satisfy the national demand for high-quality cement. Up to now, the company has used two packaging lines to transport the material quickly, and above all, safely on to trucks, enabling delivery to customers up to 1,000km away. This, however, was no longer sufficient, and in order to increase the throughput of the sometimes very fine cement, BEUMER Group supplied and installed a third line entirely from its own product line — and in a very tight timeframe.

Otavi, the nearest small town, is 20km

away. Tsumeb is north of it. One single road runs through the wide open planes. Schwenk Zement built its facility in the Namibian region of Otjozondjupa which is rich in limestone. Ohorongo Cement, or simply Ohorongo, is a wholly owned subsidiary of Schwenk Zement. The plant produces five different cements, to which Manfred Pirker, plant manager, emphasizes: “Our building material is of particularly high quality.”

DECISION FOR THE RIGHT PARTNER

After the clinker is produced, it is milled into cement. It is then made available either as loose product delivered into a bulk tanker, or in 2,000kg big bags, or filled into paper bags. “We use 50kg bags in this

plant,” explains Pirker. “After the filling, they are stacked on pallets and covered with a stretch film.” For this process, the plant has used two packaging lines, for which BEUMER Group supplied and installed one BEUMER paletpac high performance layer palletizer per line and packaging systems of the BEUMER stretch hood product lines. “But we could not cover the growing demand for cement anymore,” says Pirker. “We urgently needed to increase our throughput.”

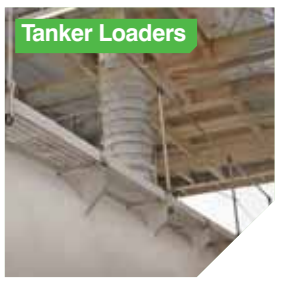
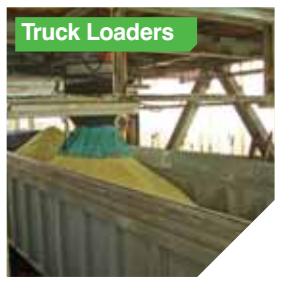
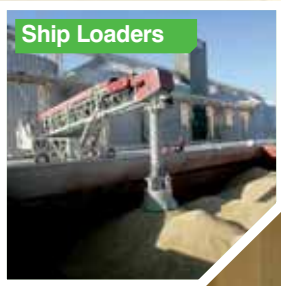
Ohorongo has had very good experience with the two existing packaging lines. The responsible management therefore knew from the start that only BEUMER Group, the single-source provider for filling, palletizing and packaging

The third packaging line was installed in an extension to the existing building built specifically for the third packing line.



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technologies, was to become its partner for supplying and installing the third packaging line. Pirker says: "We were convinced by the very good service and support on site over the years."

A HOT ISSUE

Beckum, the headquarters of BEUMER Group in Germany, received the inquiry from Ohorongu at the end of 2014. Both companies quickly agreed on the scope and scheduling, and signed the contract without delay. Unlike the first two packaging lines, this contract also contained a BEUMER fillpac bag filling system.

Hermann Krumkamp, Senior Project Manager at BEUMER Group, remembers: "We immediately started with the project execution at the beginning of 2015. We had to consider the local climatic conditions, among other things." In the desert regions, day temperatures can reach 40° Celsius and more. "This may influence the flow characteristics of the cement as well as the elasticity of the stretch film," explains Krumkamp. The machines were designed accordingly. The engineers also had to adapt the system to the newly built extension to the existing building. The containers with the new machines arrived at Ohorongu Cement in August. "We had to wait with installation, however, for the new building for the third packaging line to be completed", says Krumkamp. The specialists started with installing the machines in November 2015.

FILLING PROCESS: NOT TOO MUCH, NOT TOO LITTLE

As the produced cement is particularly fine, BEUMER Group installed a BEUMER fillpac R rotary packing machine with eight filling spouts that operates according to the impeller filling principle. Krumkamp explains: "The weighing electronics are



Ohorongu opted for the filling system of the type BEUMER fillpac R rotary packer with eight filling spouts that operates according to the impeller filling principle.

unique. This is because the product is filled according to the gross weight principle, i.e. the bags are weighed during the filling process. The BEUMER fillpac R is therefore equipped with a calibration facility integral with the weighing equipment." The weighing electronics of the machine ensure exact filling of the bags. A special software enables each filling spout to constantly, with every rotation of the packer, compare the weight and make necessary adjustments to maintain consistent and accurate bag weight of the packed product.

The impeller filling system is characterized by its speed and maximum material throughput.

BEUMER Group also included a BEUMER bag placer with bundle magazine of the latest technology to further increase the efficiency of the filling system. Servomotors drive the application unit and the suction gripper automatically, precisely and with high levels of energy efficiency. The gripping system and the application

unit apply the bag from the bag bundle safely onto the filling spout. 2,400 bags per hour can be applied like this with high precision.

GENTLE PALLETIZING IS ENSURED

BEUMER Group installed a BEUMER paletpac 3000 layer palletizer for fully automatic, reliable and most of all fast palletizing. This system precisely stacks 50kg bags layer by layer in a five-bag pattern onto the pallets. Krumkamp explains: "The system includes a twin-belt turning device, so the bags can be turned to the required position quickly, gently and without affecting their dimensions. Regarding the positioning accuracy, this device offers an immense advantage when compared with conventional turning processes." The system component moves the bags without deforming them from a mechanical viewpoint. Two parallel belt conveyors are used instead. They turn the bags by moving at different speed. They also move the bags into the required position very gently. The intelligent control of the twin-belt turning device takes into account the dimensions and weights of the bags in order to achieve an exact positioning preset by the respective packing pattern.

PACKED FAST AND SAFELY

Roller conveyors transfer the completed bag stacks to the packaging system BEUMER stretch hood A. Krumkamp explains: "We have completely redesigned this machine from the ground up. It is even more easy and safe for the user to operate than the existing systems. In order to facilitate the work for the maintenance personnel and to ensure high system availability, the system no longer needs a service platform. Maintenance work, such



The BEUMER bag placer with Bundle magazine increases the efficiency of the filling system.

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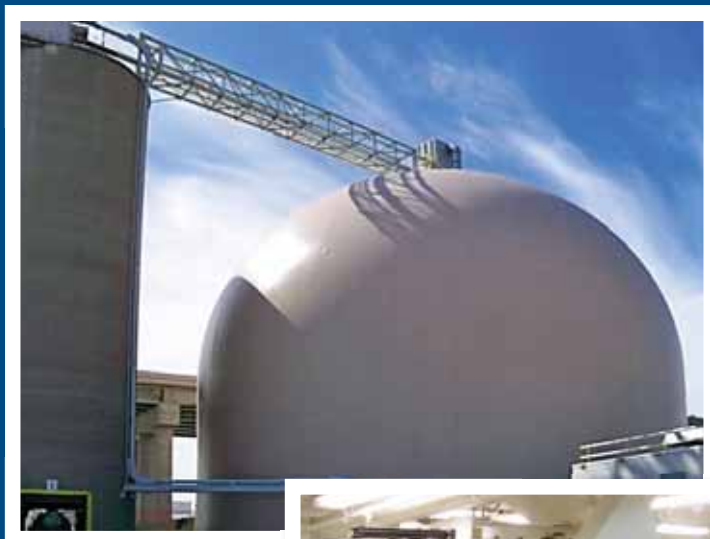
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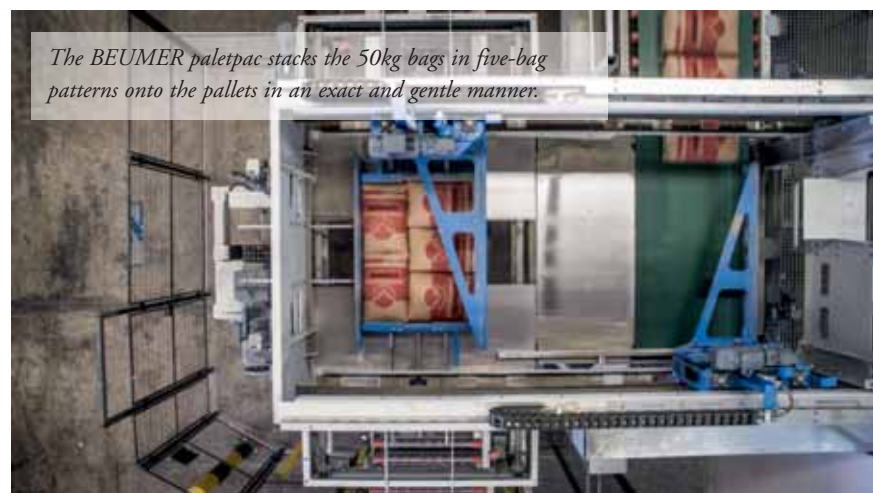
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as changing the blades or the sealing bars, is handled at floor level. Additional benefits include the compact design, resulting low machine height and a small footprint. Mr. Pirker says: "This means that the BEUMER stretch hood A fits perfectly into the new hall."

A film transport system, which is particularly gentle on the material, delivers the previously cut and sealed film hood into the system. On its way to the stretching unit, the sealing seam on the film hood cools down so that it can be stretched without losing time. This allows for the elimination of energy-consuming cooling units and efficiency-reducing cooling times. This means that the pallets can be packed in a shorter cycle time. Hermann Krumkamp



Palletizing and packaging process: BEUMER Group supplied a BEUMER paletpac 3000 and a BEUMER stretch hood A.



The BEUMER paletpac stacks the 50kg bags in five-bag patterns onto the pallets in an exact and gentle manner.

plant manager, is happy: "A packaging line that is customized to our specific requirements has been built." The tight timeframe could only be held because all people involved in the project collaborated intensively. The cement manufacturer was convinced of BEUMER Group's sophisticated technical planning, the fast development as well as optimal adaptation of the systems.

THE BEUMER GROUP

The BEUMER Group is an international leader in the manufacture of intralogistics systems for conveying, loading, palletizing,

is delighted: "We handle 60 pallets per hour. This number can be increased if required."

But there was something to consider regarding the packaging: "Unlike transportation in Germany, in Africa the material may need to travel by truck not only a few hundred kilometres, but often up to a thousand kilometres," Pirker says. In addition, high temperatures soften the material of the film. Pirker explains: "We use film of 80 and 100 micrometers in thickness in order to obtain the required transportation safety."

Ohorongo put the systems into operation in May 2016. Manfred Pirker,



Roller conveyors transfer the palletized bags to the BEUMER stretch hood A.



High requirements for packaging: The finished pallets are loaded onto the truck beds. A long journey awaits them. The client can be up to 1,000km away.

packaging, sortation, and distribution. With 4,000 employees worldwide, the BEUMER Group has annual sales of about €750 million. The BEUMER Group and its subsidiaries and sales agencies provide their customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, post, and airport baggage handling.

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Repositioning clinker cooler air cannons for safer maintenance and longer equipment life

Consistent material flow is an essential part of the cement production process. Each step, from the introduction of raw materials to the loading of the final product for transport, has unique issues. A common problem occurs where clinker discharges from the kiln and falls into the clinker cooler. Chunky material tends to cling to the static cooler grates and/or cooler curbs, building upon itself and eventually creating a super-heated formation known as a 'snowman'.

Air cannons are commonly used to remedy this phenomenon, but if they experience clogging from backflow — or if they are set in an environment that is too hot to properly maintain them — accumulations inevitably form. Material buildup can lead to inefficient operation due to the restriction of air flow from the cooler to the kiln, damaging the kiln discharge seal and creating what's known as 'false air', which can cool the burning zone. These issues increase the cost of operation through higher fuel consumption. Worse yet, it can damage the kiln's nose casting, bull nose refractory or even completely choke off clinker flow from the cooler to the kiln, causing excessive unscheduled downtime for repair.

This issue troubles cement producers all over the world, but the operators at HeidelbergCement's Lehigh-Hanson



In operation since 1905, the Lehigh-Hanson plant is the oldest continuously operating cement manufacturer in the state.

Cement Plant, located in central Alabama, worked closely with Martin Engineering on an innovative air cannon configuration to resolve it. The design prevents material buildup and allows safe cannon maintenance at any time, resulting in longer equipment life, less unscheduled downtime and a lower cost of operation.

"Our cannons were located close to cooler walls where the ambient conditions were very hot and dusty, making it difficult to keep the equipment functioning reliably," said Mike Schutt, Production Manager for Lehigh Hanson. "Our new air cannon arrangement has been a great success, and I have no doubt it could be effectively applied to many cement kiln operations around the world."

COOLER CONCERNS

Built in 1905, the Lehigh-Hanson facility is the oldest continuously operating cement plant in the state. Making Type I/II Portland cement, ASTM C595, and Type N & S masonry, the plant produces a total of 800,000 tonnes (882,000 tons) of product per year.

With a 24-hour production schedule, 160 tonnes (175 tons) per hour of raw material is passed through the kiln, reaching approximately 1,900°C (3,500°F). The viscous semi-molten clinker discharges into the cooler onto a sloped static grate and flows to a moving grate system that keeps the cooling material progressing toward the breaker and clinker storage.

Snowmen formed at the discharge point



4.5 inch (11.5mm) pipes lead down to holes drilled into the concrete floor, then continue under the subfloor.

when the river of semi-molten material came in contact with the static grate, causing the solid clinker to adhere to the surface and begin to build upon itself. Reaching up to 20 feet tall in as little as a single shift, the buildup could stretch back into the kiln and cause serious problems that result in excessive downtime and an increased cost of operation.

“Damage to the kiln seal raises our fuel costs, but if there’s significant damage to the nose casting or cooler bull nose, we’re forced to shut down the entire system and rebuild the refractory, which means days of lost production,” Schutt explained. “It seemed practical at the time to place our air cannons next to the cooler hot wall where the kiln discharges, but the environment made it nearly impossible to do maintenance on them, which increased the chance of buildup. It was not a sustainable situation.”

WHEN PREVENTION CREATES MORE PROBLEMS

To prevent such accumulation, plants commonly install air cannons. Connected to the plant’s compressed air system, the cannons deliver a powerful shot of air across the vessel to prevent buildup and ensure the material flows through the cooler.

Lehigh-Hanson’s first solution had five cannons with standard OEM piping leading directly to problem areas on what operators dubbed the ‘hot wall’, which was located right next to the hottest part of the cooler. The area had an average sustained temperature of 65°C (150°F) to 74°C (165°F), which made maintenance during operation impossible. Even during short downtime events for emergency repairs, high-heat personal protection suits were still required.

“The configuration of our blasters was pretty standard, but allowed too much backflow into the pipes and cannons,” said Schutt. “It became burdensome to maintain.”

Fine particulates from discharged clinker would migrate up the air cannon discharge pipe. Clinker dust would also settle within the cannon tank, diminishing the tank’s capacity and decreasing the power and effectiveness of the shot.

According to Schutt, the company attempted to improve operation by testing another blaster configuration. Technicians removed the five-cannon/straight-pipe arrangement and replaced it with a massive single tank with five pipe outlets. This solution had several flaws, one being that the position of the floor-mounted tank underneath the discharge zone caused

Valves face outward for convenient maintenance, requiring no tank removal to service them. Workers are able to access the tanks in a safe and comfortable area with ample room to work.



more maintenance issues and required more labour. This position also led to the plenum boxes being filled with dust and fines faster, reducing the equipment life. Moreover, the frequency and power of the configuration diminished quickly, forcing operators to monitor the cooler system closely through cameras.

“The system broke down so often, we finally just had to leave it and monitor the material buildup until the very last minute, then shut down the system for maintenance,” Schutt said. “This allowed us to get the most production possible, but it caused at least a day of unscheduled downtime a few times per year.”

Similar to the cleaning process in the preheater tower, personnel wearing hot suits would open the hatches to the cooler and knock down formations and adhered material using pressurized water. Due to the grueling nature of the work, the size of the job and the heat, the process took at least full shift to complete.

RETHINKING CLINKER COOLER BUILDUP

Lehigh-Hanson brought in Martin Engineering Product Specialist Mike Masterson to help find a solution. The expectations for the project required the system to:

- ❖ be 100% reliable and 100% accessible.
- ❖ eliminate material buildup within the cooler;
- ❖ withstand a 24/7 production schedule;
- ❖ reduce or eliminate backflow;
- ❖ be safely maintained with minimal exposure to heat;
- ❖ decrease the amount of unscheduled downtime; and
- ❖ reduce the amount of equipment failure.

The new air cannon configuration was introduced by Masterson in response to plant layout and conditions. “We worked closely with the contractor to finalize the design and implement the plan,” said

Masterson. “It’s exciting to be part of a new solution.”

Completed over a week by a team of four people during scheduled plant downtime, the design lifted the cannons away from the discharge area and up to a preexisting platform several meters away. Five cannons were connected to five U-shaped pipes that curved 90° from the cannon, ran vertically 10 feet (3m) down and through holes drilled into the concrete floor of the plant’s cooler maintenance platform. They then curved 90° again and travelled horizontally for 20 feet (6m) under the platform to the kiln’s discharge area, where they split toward different entry ports for maximum coverage. Special nozzles made out of refractory material — purchased by Lehigh operators from a refractory supplier — distributed the surge of air toward the areas of likely buildup.

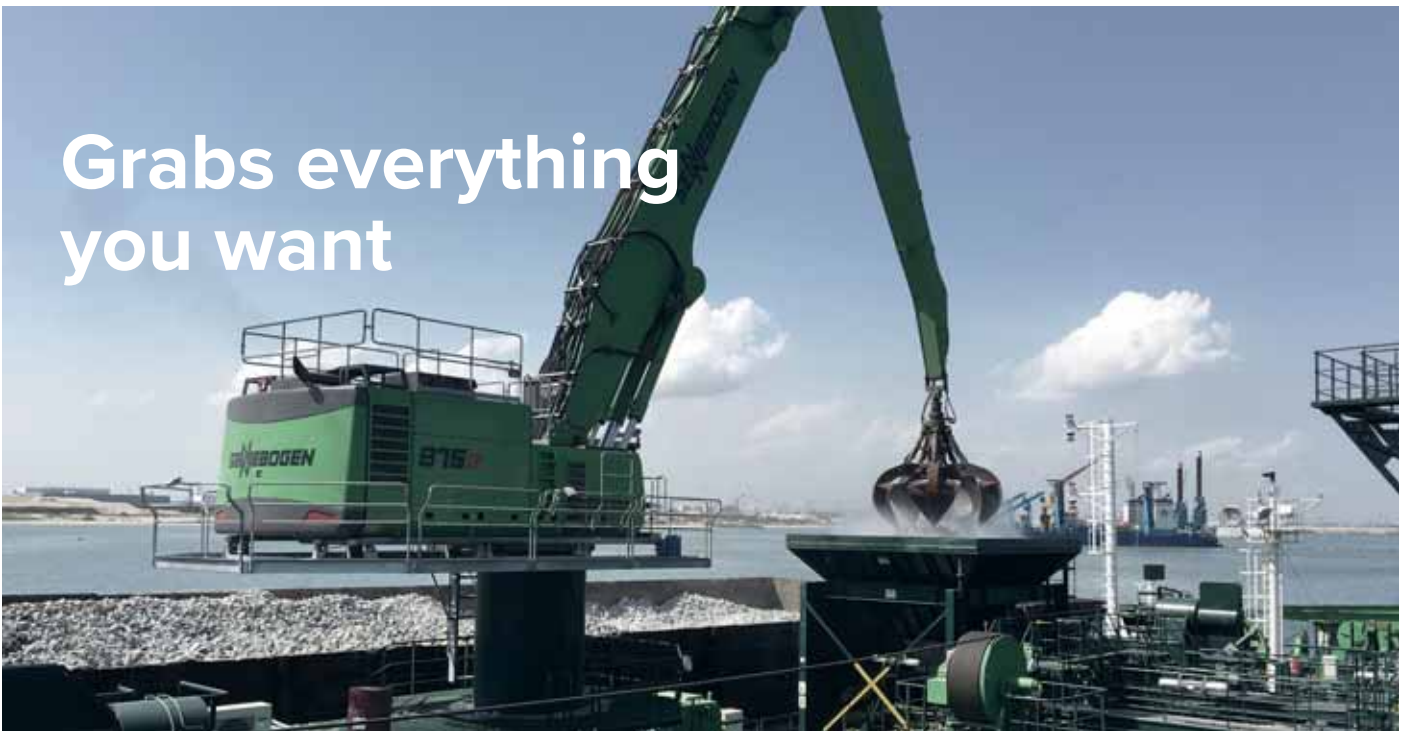
Being set well away from the hot wall and the kiln’s discharge zone allows the cannons to be serviced without workers wearing the special equipment needed for hot areas. The U-shaped pipe design directs the powerful shot of air and limits the amount of material backflow. Fugitive fines entering the pipe are obstructed by the curvature, the distance and the long vertical climb needed to reach the cannon.

INNOVATIVE SOLUTIONS REQUIRE INNOVATIVE EQUIPMENT

The biggest challenge for the design was the distance the air had to travel before entering the chamber. The longer the distance, the more it would lose velocity and thus deplete the effectiveness of the shot once it reached the chamber. The solution to this problem was installing larger individual cannons using a positive firing solenoid valve.

“Previously, the cannons could be smaller because they were closer to the cooler,” said Masterson. “But since the air

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After five years of service, the cannons continue to operate at a high level of reliability.

has to travel further, we installed the powerful 150-litre Hurricane™ Air Cannons. They hold an enormous capacity and deliver enough pressure to carry the air all the way down the pipe system and still pack a serious punch at the end.”

Connected to the existing compressed air system and weighing approximately 130 lbs (59kg) each, the Hurricanes supply more force output with less air consumption at half the size of other designs. Each unit fires a shot of air at up to 120PSI (8.27BAR) from a pressurized tank through the long pipes and spreads the airstream across the area of buildup.

Linked to the plant’s logistical software in the central control room, the cannons are set on a ten-minute firing cycle with one discharging every other minute. To prevent unintentional firing due to drops in pressure, which can throw off the sequence and diminish the effectiveness of the system, the cannons are equipped with a positive-acting valve. To trigger discharge, the valve requires a positive signal from the solenoid in the form of an air pulse. Able to be located up to 200 feet away from the cannons, the solenoid panel also allows operators to fire manually if needed.

Though the valves at Lehigh-Hanson have not yet needed replacing, they require periodic maintenance and inspection. Previously, workers donned hot suits and protective gear to enter the area where the cannons resided, and they were required to remove the entire cannon from the manifold for valve service. Reported to

have been one of the most unpleasant projects in the plant, at least two workers were needed to perform the maintenance and, due to the heat, they were only able to remain in the area for about five minutes at a time.

The Hurricane’s valve faces outward, opposite the pipe end, and is serviced without removing the cannon tank. A single technician simply detaches the air and solenoid connections, removes the eight bolts from the valve assembly and slides it out for inspection and maintenance.

“The design reduces the amount of time and labour needed to maintain the equipment,” said Masterson. “And by eliminating the need for heavy lifting, it improves safety.”

THE STANDARD MOVING FORWARD

“After five years of constant operation, the results have been better than we ever expected,” said Schutt. “Since installation, we have had a significant reduction in downtime due to snowman formation. Not having to get near the hot wall or put on special equipment has definitely made a difference in the morale of the maintenance and production staff.”

By moving the cannons away from the hazardous area, the lack of heat exposure has reduced the impact on the equipment itself, increasing the life of the valves and the tank. Setting the tanks in an easily accessible and safe area means that workers can inspect the equipment more often and perform maintenance on a single

cannon without downtime.

The cannons no longer experience buildup from backflow within the tank, allowing them to operate at full capacity. However, according to Schutt, there are some issues with abrasion on the air cannon pipes coming off the hot wall. The company has installed pipes with a different abrasion resistant alloy. So far the change has been a success.

“Overall, we are very satisfied with the design and the equipment,” Schutt concluded. “I can see this configuration becoming a standard design across the cement industry.”

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 (available free in print and online) is an internationally-recognized resource for safety, maintenance and operations training — with an estimated 10,000 copies in circulation around the world — and employees take an active part in ASME, SME, VDI, CMA and CEMA. The firm also 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, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK.

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Bedeschi cements its reputation in the market with recent contracts



SEMEN PADANG

Bedeschi Spa has been successfully delivering crushing and handling machines for the cement industry, steel plants, coal and other industrial processes for over 50 years. Fifteen years ago, Bedeschi added a marine division producing a wide range of shiploaders and unloaders for on-shore

installations. In particular, in Indonesia Bedeschi recently completed the delivery of a shiploading unit for Semen Padang.

This SHL type machine, rail mounted, with slewing and luffing boom, can load clinker and cement at maximum rated capacity of 1,500tph (tonnes per hour) on vessels of up to 40,000dwt.

This unit was engineered by Bedeschi to fit in the existing jetty rails, layout and conveyor system.

The machine features a complete aspiration system on tripper loading point and hold loading telescopic chute, able to comply with tightest environmental requirements applicable to port areas.

Vassiliko shiploader.



One of the two Bedeschi shiploaders built for Medcem Cement at Yesilovacik Port in Turkey.



NEW CLINKER EXPORT TERMINAL FOR VASSILIKO CEMENT

Another specific project is based in Vassiliko (Greece), quoted as an example of alternative technology related to the information above, since it's a rubber mounted shiploader which clearly demonstrates Bedeschi's ability to understand the client's requirements and to offer high-level engineering solutions. For Vassiliko Cement Plant, ten years ago Bedeschi developed a circular limestone storage facility. Recently, Bedeschi was also awarded a contract to develop a clinker export terminal.

The system will be installed in the port terminal of the cement plant equipped with a shiploader on tyres and with surface feeder. The trucks arrive on the dock, and discharge the material on the surface feeder directly connected with belt conveyors to the shiploader.

The entire system moves along the quay to optimize the loading of vessels. The capacity is up to 550tph, and it is possible

that this will be increased in the future to 800tph.

In order to safeguard the environment in and around the port, Vassiliko opted for a receiving track surface feeder, a closed system with closed cover and negative pressure. There is no dust created during unloading operations, and the belt operates at a low speed. The drop from the chute is not high, and there is negative pressure between the unloading chute and the belt.

CASE STUDY YESILOVACIK PORT, EREN HOLDING, TURKEY

Bedeschi supplied raw materials handling machines for Medcem Cement, a newly establishment manufacturing company within Eren Holding, located in Mersin, Turkey. Bedeschi was also awarded by Eren Company a contract to supply two shiploaders, for clinker and cement, and one ecohopper for receiving and delivering coal at a capacity of 1,200tph. The shiploaders are designed for loading at a rate up to 1,400tph onto vessels of up to

40,000dwt. The shiploaders are slewing and travelling type. The machines will be installed in the new Yesilovacik harbour terminal, located a few kilometres away from the Medcem Cement factory, and that will become the connection point for the raw materials and final product import/export operations. Commissioning of the Medcem Cement facility took place at the end of 2014. The machine is now under commissioning for a plant with a production capacity of 10,000tph of clinker.

CONCLUSION

Investments into eco-friendly and innovative equipment are essential for the complete modern port environment. Because port infrastructures — which include the space necessary for operations — are expensive, Bedeschi is able to help the client by providing compact, functional, and eco-friendly machines, taking care of all the pollution aspects and contemporary able to guarantee the perfect filling of vessel cargo holds.

Powder storage silos – dangers remain on many sites

Silo protection expert Hycontrol explains the requirement for comprehensive silo pressure safety equipment and the dangers facing sites with insufficient protection.

INTRODUCTION

Despite clear information about the risks posed by silo over-pressurization, and a recent spate of incidents including a fatality in Europe and several injuries, cement storage silos are still frequently under-equipped in terms of pressure safety equipment.

Silo protection expert Hycontrol has worked hard to educate site staff, managers and executives. The company has collated data from sites across the UK. According to



A blocked filter can lead to disaster.

MD Nigel Allen, the results are deeply unsettling.

“On a sample of 25 silos, we recorded nearly 1,000 pressurization incidents,” says Allen. “When one considers that there are around 4,000 cement silos in the UK alone, the scale of the problem becomes clear. Many powder silos are disasters waiting to happen, putting lives at risk.”

“Companies just don’t seem to understand the consequences,” he says. “If an ‘event’ occurs, over-pressurization could easily rupture a silo or eject the filter housing from the top. Indeed, we are aware of several incidents like this that have happened recently.”

WHAT CAUSES OVER-PRESSURIZATION?

If air can enter a silo and exit via its filter venting unit without restriction, then there will be no over-pressurization issues. Over-pressurization only ever occurs when the volume of air entering the silo exceeds the volume of air able to escape. There are two likely causes for this: either the airflow out of the filter unit is restricted, or the airflow into the silo is greater than the system is capable of exhausting.

Delivery tankers are pressure-tested vessels typically capable of withstanding up to 2 bar (29psi) pressure and can offload at 13,000m³ (459,000ft³) per hour. Consider that storage silos, by contrast, are only designed to withstand the weight of material stored in them and can rupture at pressures as low as 1–2psi above atmospheric. A typical silo air filter can only discharge air up to 1,700m³ (60,000ft³) per hour.

WHAT ARE THE RISKS?

The dangers and possible consequences resulting from insufficient silo protection include:

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❖ **danger to staff:** the most dangerous outcome is that the filter unit may be blown off the top and drop into the work-yard below, risking severe injury or even death for site personnel, contractors and drivers.

❖ **damage to silo:** over-pressurization can rupture a silo, resulting in extensive disruption and loss of production. Sites will be faced with either expensive repairs or having to replace the entire silo.

❖ **emissions into the atmosphere:** blown-out product can cause damage to the local environment. This can result in large fines and expensive clean-ups.

Additionally, even if limited silo protection is in place, staff members face further risk from working at height. Silo-mounted safety equipment requires regular testing, putting staff in danger from slips, trips and falls. According to figures from the UK Health & Safety Executive, falls from height were the cause of 37 UK workplace fatalities and an estimated 37,000 injuries in 2015/16 alone.

It is clear that insufficient silo equipment, the functionality of which can



Hycontrol's SHIELD.

at best only be tested by climbing the vessel, creates risk on sites. A silo safety system is only as effective as the last time it was fully tested. So what can be done?

EFFECTIVE SILO PROTECTION WITH SHIELD

The solution is an integrated approach to silo protection where the PRV, pressure sensor and high-level alarm are tested from ground level before each fill. Only when all these pass the checks should the safety interlock allow the inlet valve to open for delivery. Hycontrol achieves this in the new SHIELD Silo Protection System, featuring a single-button Ground Level Test (GLT) function.

It is important to distinguish this from a

lamp test. A lamp test will, as the name suggests, show that the alarm lights on the panel are working but this is not a test of sensor functionality. As such, these tests cannot be relied upon. Additionally, the SHIELD system records pressure events during the filling process with a time and date stamp. This allows managers to carry out effective predictive maintenance.

CONCLUSION

A silo protection system requires full functional testing of the pressure sensor, high-level sensor and PRV; silo filling auto shut-off linked to the control system; self-cleaning functions; time/date-stamped recording of pressure events, PRV lifts and high-level alarms; and filter air supply monitoring. These ensure the integrity of the silo system, minimizing risk.

Whilst there will always be restraints imposed by budget limitations, silo pressure risks cannot be neglected. The dangers are clear and irrefutable. Site owners can no longer ignore them; to do so invites unacceptable risks. The worst-case outcome is a filter being blown from a silo-top, causing serious injury and death. The consequences of ineffective silo protection cannot be stated any more starkly than this.

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TAKRAF shiploader successfully commissioned in Playa del Carmen, Mexico



TAKRAF USA team, consisting of Javier Alverado, George Dawidowski, Jurgen Lukas, George Morea, Thomas Gramling, and Chris Casper (source: TAKRAF).

Amidst the numerous five-star all-inclusive resorts in Playa del Carmen in Mexico, TAKRAF USA —part of the global mining, bulk material handling and minerals processing equipment supplier, Tenova TAKRAF — has erected and successfully commissioned a 6,000tph (tonnes per hour) rail-mounted shiploader at an important limestone mine's port facility.

The client, a NYSE-listed entity and amongst one of the largest producers of construction aggregates in the United States, is major supplier of limestone to North America, with the port typically loading approximately 20 Panamax (50–60,000dwt) sized cargo ships per month. The new shiploader recently loaded the required three ships without incident,

thereby successfully completing the performance requirement of the contract.

The shiploader was designed and procured from TAKRAF's Denver office with structural steel being fabricated in nearby Merida, Mexico. The new machine provides many improvements over the existing 30-year-old machine including upgraded capacity, up-to-date VFD controls,



The TAKRAF shiploader is now installed and working on site in Mexico (source: TAKRAF).



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improved redundancy, and numerous maintenance and safety enhancements.

“The TAKRAF team on site managed an unbelievable feat by removing the existing shiploader and preparing the new machine for operation in a mere three days — an incredible two days less than required by the contract”, said Tom Gramling, TAKRAF USA President. “This, together with the strong performance of our machine, resulted in the client expressing complete satisfaction with our service and how we operate. We strive to ensure that we work for the best interests of our clients and their operations.”



The new shiploader recently loaded the required three ships without incident, thereby successfully completing the performance requirement of the contract (source: TAKRAF).

ABOUT TENOVA TAKRAF

Tenova TAKRAF 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, more recently, the Tenova Advanced Technologies (formerly Bateman Advanced Technologies) brand of products into TAKRAF, its portfolio for the mineral processing and beneficiation sectors has been considerably enhanced.

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.



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Italian Equipment Manufacturers

RULLI RULMECCA



Jay Venter

Rulli Rulmecca Spa: committed to the market

THE COMPANY

Rulli Rulmecca Spa is a family owned company, based in Almè (Bergamo) Italy, and is the headquarters of the worldwide group RULMECCA. It specializes in the development, production and sales of belt conveyor rollers/idlers, motorized pulleys, fabricated pulleys and other components for the worldwide bulk handling industry.

Rulli Rulmecca has been working with conveyor components for the bulk handling industry since 1962. Today, as a global supplier of rollers and motorized pulleys, Rulmecca works internationally with leading OEMs, engineering companies and end-users in the major applications within the bulk materials handling market such as; coal and lignite mining, cement, quarries, tunnelling, power plants installation, ports, salt and fertilizers, sugar plants, recycling and demolition, crushing and screening etc.

THE MARKET AND RULMECCA'S COMMITMENT

Market demands for improved efficiency and higher throughput simply do not allow for maintenance stops or breakdowns.

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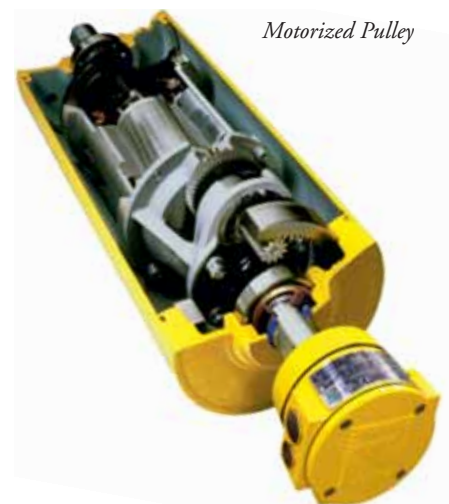
RULMECCA PSV roller

conveyor systems. The result of RULMECCA's total quality philosophy is evident in the expansion of the group as a major force in the global market.

From research and development to final product quality control, the RULMECCA Group's commitment to quality is always evident and present.

RULMECCA's focus on quality has led to a group-wide policy oriented towards continual investment in manufacturing and technology, in the quality of the materials used and in research and development.

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Fax: +39 035 4300391
e-mail: rulmecca@rulmecca.com

RULMECA - EUROPE

Denmark
RULMECA A/S
e-mail: dk@rulmecca.com

Finland
RULMECA OY
e-mail: fi@rulmecca.com

France
RULMECA FRANCE S.A.S.
e-mail: info.france@rulmecca.com

Germany
RULMECA GERMANY GMBH
Aschersleben
e-mail: de@rulmecca.com

Leipzig
e-mail: de@rulmecca.com

Great Britain
RULMECA UK Ltd
e-mail: uk@rulmecca.com

Italy
RULLI RULMECA S.P.A.
e-mail: export-it@rulmecca.com

Spain/Portugal
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Sweden
RULMECA A/S
e-mail: se@rulmecca.com

Turkey
RULMECA Taşıma Aksamları Tic. Ltd. Şti.
e-mail: turkey@rulmecca.com

RULMECA NORTH & SOUTH AMERICA
Canada
RULMECA CANADA LIMITED
e-mail: sales-ca@rulmecca.com

USA
RULMECA CORPORATION
e-mail: sales-us@rulmecca.com

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INDUSTRIAS RULMECA S.A.
e-mail: rulmecca@rulmecca.com.ve

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PT. RULMECA INDONESIA
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received a positive response from the market.

By focusing its efforts on the demands of the market and the needs of its customers, the RULMECA Group offers:

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- ❖ a market-leading product range within rollers and motorized pulleys distributed globally;
- ❖ a group-wide implemented quality system helps to ensure RULMECA is meeting and exceeding customer expectations;
- ❖ a continuously expanding and evolving product range;
- ❖ constant improvement in technical, design, and service; and
- ❖ a global market reach as a direct result of its ten manufacturing sales companies and eight sales companies.

Rulmeca Group expands global presence



The Rulmeca Group, is expanding its global presence in the conveyor pulley business for bulk materials handling.

Rulmeca's South African subsidiary, Melco Conveyor Equipment, has acquired CPM (Conveyor Pulley Manufacturers) located in Johannesburg with effect from 1 August 2017.

Carsten Spanggaard (MD of the Rulmeca group and chairman of Melco), confirms the importance of Rulmeca gaining strength in this product line and welcomes the agreement with the owners of CPM and the experience that the existing CPM team will bring to Melco.

"Our aim is to always be moving ahead and improving our product offering and service. Our priority remains with planned investments for the pulley business, and we welcome this wonderful opportunity" says Spanggaard.

The managing director of Melco, Danie O'Connell welcomes all existing employees of CPM into the Melco Team stating "It is

significant for Melco to make this agreement with CPM's owners and we are ready to invest in this business to improve further capacity and service to our customers".

O'Connell continues; "The product range of CPM's quality is already excellent. We shall invest in people, machinery and space to further build on existing strengths and ensure that the pulley range fits in well with our range of rollers, idlers and structure which are well integrated into the market."

Founders and owners of CPM, Doug Fenner and Othmar Hiebb, will remain with the business and state: "This is for sure the right move for CPM as a company and for our management and staff".

"Joining a larger group will give the stability and investments the business deserves and requires, and we are excited to stay and play our part in the integration ensuring the growth of the business together with the Melco team" confirms Fenner and Heeb.

CFS Handling delivers electro-hydraulic grab to Port of Augusta, Sicily



This CFS Handling electro hydraulic grab was delivered to the Port of Augusta, Sicily and started operating at the start of October 2017.

Civettini Italo & c sas — under the brand name CFS Handling — is a designer and manufacturer of bulk handling equipment. Its equipment is used in industry sectors including: ports, cement, steel works, scrap, coal, grain, zirconium, demolition, waste, shred material, turning chips, urban solid waste, paper, cast iron ingots, ores, slag, bales and so forth. The company's product range includes mechanical, hydraulic and electro-hydraulic buckets, as well as hydraulic and electro-hydraulic grabs.

CFS Handling's machines are characterized by the fact that they are made from wear-resistant building materials, such as Hardox 500 for the blades, or automatic greasing systems on the buckets. This decreases maintenance time, prolonging bucket life.

Negrini grapples and buckets fit for any job



The Negrini company, established in 1967, specializes in the engineering and manufacturing of a comprehensive range of grabs and buckets for rope machines and crawler-mounted cranes. The company manufactures a wide range of products, including:

- ❖ **Electro-hydraulic and hydraulic orange peel grabs** to handle rocks, waste for recycling and loose material. To be operated they require crawler mounted cranes and, in general, boom lifting machines.
- ❖ **Two- or four-rope orange peel grabs** to handle rocks and waste to be recycled. To be operated they require crawler-mounted cranes or, in general, boom lifting machines.
- ❖ **Electro-hydraulic and hydraulic clamshell grabs** for the handling of any loose material as well as for dredging work in confined areas such as near jetties or quays.
- ❖ **Dual-scoop grabs** to handle loose material, including the load inside ship cargo compartment. For operation they require two- or four-rope boom lifting machines or crawler-mounted cranes.

- ❖ **Radio-controlled single rope grabs** meant to handle any loose material. The dust and waterproof radio controls the opening of the bucket. They can be operated by any kind of crane.

- ❖ **Environmental hydraulic clamshell bucket** to load polluted mud, especially for sea or river ground. The two peculiarities of this + range of buckets are that at lifting the two sides copy the ground they come in contact with, hence leaving it flat so the digging depth is automatically controlled. Furthermore, the valves on the upper part allow water to flush away without releasing polluted mud in the water.

Negrini prides itself on the quality of its buckets and grabs, as well as the very accurate and skilful engineering work; in fact Negrini supports its clients by analysing the job to be done and, if needed, by adjusting the standard design of grabs and buckets to enhance their performance once in operation.

Innovative and state-of-the-art, the electro-hydraulic buckets of Negrini, are ideal solutions for single-wire electric-powered machines.

MAIN FEATURES OF THE EQUIPMENT

- ❖ Independent removable electro-hydraulic unit with 'visible' components.
- ❖ Independent control unit that works even when disconnected from the bucket.
- ❖ Oil filtration up to 3 microns, the standard filtrations are approximately 60 microns.
- ❖ The bucket can be used either transversally or lengthwise.
- ❖ It is possible to change valves with different shapes and sizes.

The buckets are available in different models, each one with different characteristics, like standard, low, with arms and subwater.

The buckets can be supplied with valves of different shapes: 'standard' valves, valves with opening windows to reduce load capacity, 'dustproof' or 'containment' valves to reduce material loss. Metal or rubber covers can be applied to reduce dust loss to protect the environment.

The new geometry of the valve allows the material to pass through without obstacles and allows constant evacuation



into the drain, without violently releasing the material.

Possible installation of covers and blades to reduce dust dispersion.

By replacing the valves Negrini can change the characteristics of the bucket; it will be possible to fit large valves for handling lighter materials, or smaller (but heavier and stronger) valves in the presence of hard and difficult to penetrate materials.

In the case of difficult materials, long special or commercial 'rippers' should be considered.

On request, the synchronization of the valves is achieved through an innovative hydraulic device. Teeth or connecting rods are excluded, eliminating wear, breakage and maintenance.

The exclusive Negrini synchronization system avoids maintenance and mechanical breakdowns.

If synchronization of the valves is required, it can be achieved through the equal division of the oil to the jacks, through an innovative hydraulic system, the jacks receive the same quantity of oil both in opening and closing obtaining the correct movement of the valves without using mechanical parts. All jacks have a slowing device to prevent the impact of 'limit switches' in the valve opening.

The pistons and hydraulic hoses are

protected from impact, all jacks have a slowing device to prevent the impact of 'limit switches' in the valve opening.

Full hydraulic piston and hose covers protects against accidents.

The most sensitive and difficult zone to inspect is the valve connection bushing. Negrini has inserted a large bushing that can be easily replaced. The bushing is protected by two commercial 'o-ring' type gaskets — these are blocked in place and do not allow dirt to enter, the pressure on the outside of the grease easily raises the gasket until it escapes, releasing the grease lubricating the walls and removing dirt.

By using an electropump and a specific distribution system, all the pins will be greased automatically, a quantity of grease will be sent to each pivot independently of the resistance created by dirt, distance, etc., every pivot will be lubricated as programmed. The user will be asked to check the grease level in the tank.

The pins will be lubricated by the automatic lubrication system, but when possible they will also maintain the traditional external lubricator to allow for manual emergency greasing.

The 'tower' tank allows for a strong inclination of the bucket without compromising its proper functioning, the extraction of oil in the lowest part of the tank will never be reached by air.

The complete tank control unit can be easily tested or maintained on the ground — it will not be necessary to disconnect electrical or mechanical parts before extraction, but only the hydraulic connections connecting to the bucket. The operation to remove the control unit from the bucket can take about one hour.

Negrini has inserted the heart of the hydraulic power station in a single metal block; by simply removing four screws it is possible to replace the entire valve unit. The operation can also be performed by personnel who are not particularly experienced. Oil filtration is up to 3 microns (standard filtration is about 60 microns).

The buckets can be equipped with standard hydraulic power stations (with solenoid valves) or with reversing motor, in which the solenoid valves will not control the opening and closing of the bucket but the reversal rotation of the motor, in one direction the bucket will open in the opposite direction will close. In both systems oil filtration will take place up to 3 microns (standard filtrations are about 60 microns).

The versatility of the project will allow the bucket to accommodate hydraulic power stations with different power supplies from the standard supply, in many cases the units will be replaceable.

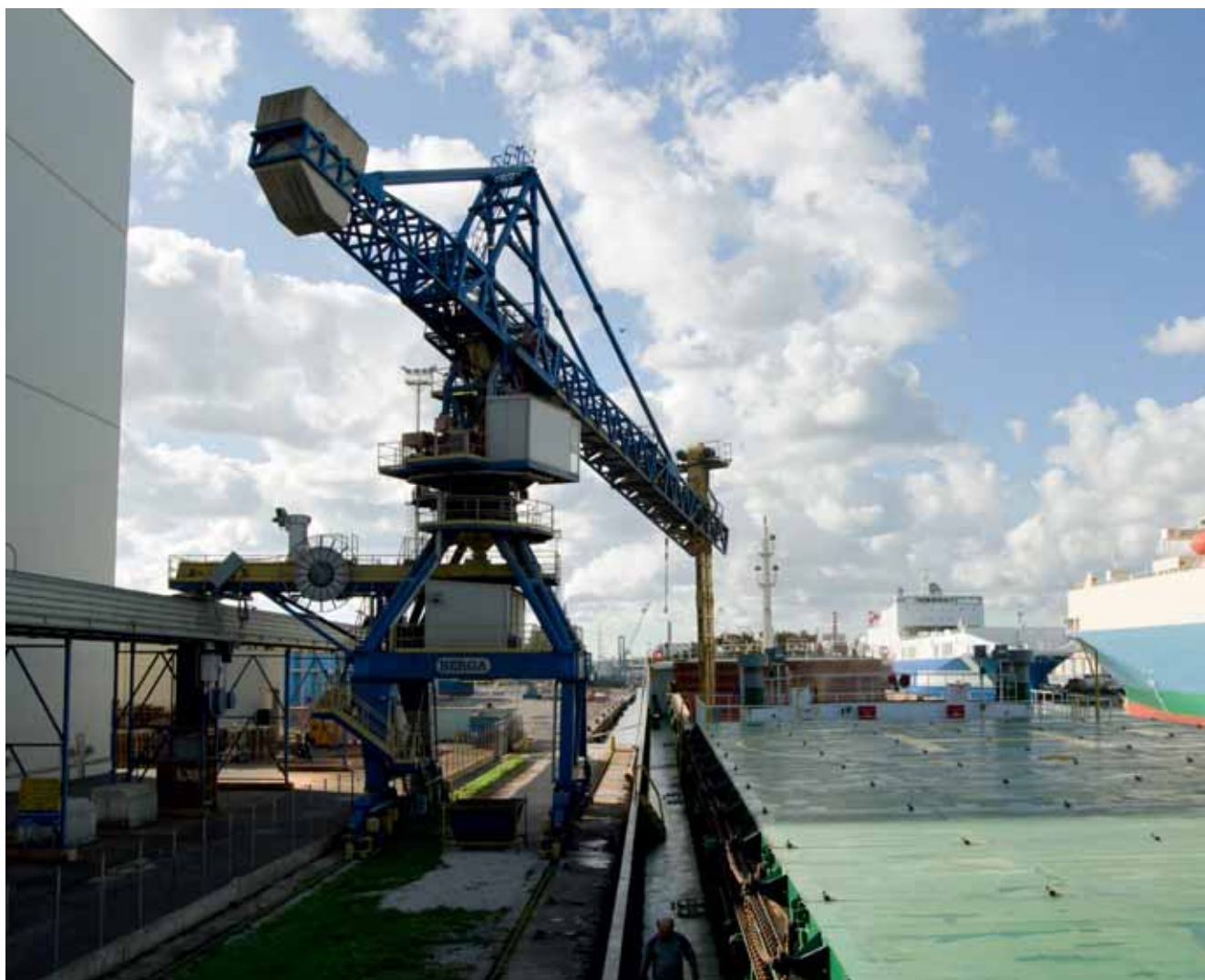
Sönmez Cimento, Bedeschi's shiploader undergoing commissioning

Further to the contract signed on June 2016 with Sönmez Cimento, Bedeschi's shiploader is now under commissioning and has been ready for performance testing since the end of October 2017.

The slewing, luffing and travelling shiploader has a loading capacity up to 1,000tph (tonnes per hour). The integrated cement plant will be based in Adana Yumurtalik Serbest Bölgesi (Turkey).

The machine is equipped with the latest eco-friendly systems and features and confirms the presence and success of Bedeschi in the Turkish area after the previous installation in Yesilovacik Port".

Golfetto Sangati: serving the bulk industry



Golfetto Sangati is an Italian company which develops, builds and installs turnkey plants of durum and wheat mills, maize mills, animal feed plants, rice mills, shiploading and unloading systems, storage for raw materials and finished products. It

is a strong industrial entity that responds to the market's requirements in a competitive way and with technologically advanced solutions which comes from extensive research, experience and expertise in all the processes.

Golfetto Sangati relies on more than 200 employees working in different departments, from the initial design development to the final building. The project team is an highly skilled group working in the company offices and in the manufacturing sites (35,000m²).

Golfetto Sangati has installed more than 5,000 plants in 130 different countries and since 2010 has been part of Pavan Group, a global specialist in the design and engineering of technologies and integrated product lines for cereal based food.

EQUIPMENT MANUFACTURED

Golfetto Sangati has developed advanced technologies for the cleaning, calibration, selection and storage of seeds and other free-flowing or not free-flowing commodities.

The company has considerable experience in the development of complete shiploading and unloading systems for harbours, with advanced expertise in the relevant technologies — from the first pneumatic towers to the latest mechanical systems.





The wide range of loaders and unloaders uses the best building solutions, offering fixed and mobile solutions, on wheels or tracks with handling capacities ranging from 200tph (tonnes per hour) right up to 2,000tph for ships of up to 120,000dwt.

PRODUCTS HANDLED

Free-flowing or non-free-flowing materials such as wheat, corn, barley, soybean, sunflower seeds, rapeseed, coffee, rice, soy meal.

ENGINEERING ACTIVITY AND DEVELOPMENTS

Some of Golfetto Sangati's most notable development and engineering activities include:

- ❖ anti-collision system specifically designed by Golfetto Sangati to prevent any risk of collision during the movements of the loader/unloader due to weather conditions or blind spots and preventing accidents due to human error (in particular for travelling collision, horizontal boom collision,



vertical boom collision and product hatch automatic detection);

- ❖ KICK IN KICK OUT system with self-regulating dust suppression system for shiploader — also for high-capacity shiploader (2,000tph);
- ❖ efficiency across vessel unloading higher than 70% of the rated capacity (tph);
- ❖ simple steel works design for fully equipped towers, from power connection point to loading/unloading point;
- ❖ low energy consumption during loading/unloading; and

- ❖ wide range of customizable technical and operational configurations.

RECENT NEWS

In 2017 Golfetto Sangati has been awarded some contracts for the handling of coffee in Italy and Canada, in particular including transportation, screening, cleaning, storing and loading of coffee beans.

During the last months, some new solutions for loading and unloading system have been studied for medium-size and small-size installation such as fluvial terminals.





DESIGNED, ENGINEERED AND BUILT WITH 90 YEARS OF EXPERIENCE AND EVOLUTION

Golfetto Sangati is an Italian company who designs, manufactures and installs turnkey plants for grain handling and milling. Part of the Pavan Group, is a strong industrial entity answering to the market`s requirements in competitive way and with technologically advanced solutions, originated from extensive research, expertise and know-how.

Golfetto Sangati is the owner of Berga brand: with more than 50 installations done and having a leading role in the technological progress from the first pneumatic unloaders to the latest mechanical loaders/unloaders, Berga is a point of reference for the design and construction of complete ship loading and unloading systems for ports.

The Berga product range, completely designed and assembled in Italy, is composed of handling and storage systems, loading and unloading systems on wheels or tracks with handling capacity ranging from 50 to 2000 t/h.



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DemcoTECH tailings disposal system

The fixed downhill conveyor is equipped with a low speed regenerative electric-hydraulic braking system to prevent the conveyor from running away.



DemcoTECH delivers system to Lihobong in fast track contract

Carrying out a fast track contract, materials handling and niche process plant specialist, DemcoTECH Engineering, designed and supervised construction and commissioning of a materials handling system for the disposal of dry tailings at Lihobong Diamond Mine in Lesotho in less than a year.

The contract, covering design, engineering, supply, erection and commissioning supervision, was awarded to DemcoTECH by Turnkey Civil Lesotho, on behalf of diamond-producer Firestone Diamonds, which holds a 75% interest in Lihobong, with the remaining 25% owned by the government of the Kingdom of Lesotho. The contract brief called for a system to dispose of between 3mt (million tonnes) and 4mt/year of dry tailings, and capable of withstanding the extreme weather and rugged mountainous conditions at high altitude in Lesotho, while at the same time being completely routable or extendable.

The first route comprised of downhill conveyor, transfer house and mobile slewable stacker, which became operational in November 2016, just eight months after the contract award in March 2016. The second or main route was operational by

February 2017. These tight contract deadlines were met despite the challenges posed by access to and working in the high altitude location of Lihobong (2,600m above sea level), the requirement for special engineering solutions, inclement weather and the demanding terrain.

DemcoTECH designed advanced features into the system, including a belt storage system, enabling the entire system to be extended by 60m within a 24-hour time period. The tailings disposal system consists of a fixed downhill conveyor rated at 700tph (tonnes per hour), which is equipped with a regenerative electric-hydraulic braking system to prevent the conveyor from running away. In addition, a 20m mobile slewable emergency boom is part of the standby route, while other components of the system include a 120m-long retractable conveyor, a 450m-long extendable conveyor inclusive of the belt storage system and a slewable 15m mobile stacker that is 4-wheel driven. This allows the machine to be self-propelled.

The ability of the 450m-long extendable conveyor's belt storage system to extend the conveyor by 60m increments reduces the number of belt splices, thereby reducing the standing time when the head

station, also mounted on a pontoon, is pulled for repositioning using mobile equipment such as a front end loader. The head of the conveyor feeds onto a mobile, self-propelling slewable stacker, mounted on rubber tyres and equipped with hydraulic drives, which can be repositioned by remote control.

DemcoTECH has a well established track record in Southern Africa and in working in similar challenging, high altitude environments such as at Letšeng Diamond Mine in Lesotho. Contracted first in 2008 for the tailings disposal system at Letšeng Diamond Mine, DemcoTECH has continued to service the mine's expansion initiatives, with its most recent work focused on upgrading part of the mine tailings materials handling capability. In addition to upgrading the ROM stacker as a turnkey contract, DemcoTECH completed the conveyor design and expansion layout to increase the tailings dam to handle the expanded throughput.

While DemcoTECH is a local South African based operation, it has also seen considerable success internationally. It has recently been awarded a contract for a sulphur handling system in Malaysia, following the successful completion of

The 4-wheel driven mobile slewable stacker is being fed by the 450m-long extendable conveyor inclusive of the belt storage system.



other offshore work which has included the detailed design for an import terminal at Port of Ploce in Croatia, handling both iron ore and coal, though to the very large contract for the multimillion-dollar iron-ore import/export facility in Lumut, Perak, Malaysia. Taking a number of years to complete, this giant complex for Brazilian major mining group Vale included an ore storage yard and a marine terminal with a 60mt-a-year capability.

ABOUT DEMCO TECH

DemcoTECH Engineering is a specialist bulk materials handling and niche process plant company, offering services from concept design through to project completion to the power generation, cement, mining, metallurgical, manufacturing and port handling industries. Services include conceptual design, feasibility studies, design, engineering, procurement, expediting, construction and commission-

ing. Plant supplied by DemcoTECH includes troughed conveyors, air-supported conveyors, pipe conveyors, rail-mounted slewing boom stackers, pivot boom conveyors and mobile conveyors. After-sales services include spares, maintenance, refurbishments and operational readiness packages covering procedures, systems and workplace tools required to successfully operate and maintain a new or upgraded plant. **DCi**



Overview of Liqhobong Conveyors.

Importing dry bulk materials with SAMSON Eco Hoppers

*SAMSON Eco Hopper on rails
(photo: SAMSON).*



The worldwide demand for Eco Hoppers is growing as stakeholders involved in the import of dry bulk materials are increasingly being held to account for the ecological and health implications of fugitive dust, writes Karl Woodhouse, SAMSON Materials Handling Ltd. Ely, UK. Port operators are working under strict guidelines to reduce dust levels and by employing Eco Hoppers, rather than simple hoppers, material throughput remains high without adding to environmental pollution.

DESIGNED TO FIT EXISTING PORT OPERATIONS

SAMSON Materials Handling designs and manufactures Eco Hoppers for the economical and ecological importation of dry bulk materials. Eco Hoppers receive material directly from grab cranes which can be situated either on the ship or on the

quay. Eco Hoppers provide a flexible solution to importing bulk materials as they can be rail- or wheel-mounted, allowing the operator to manoeuvre them off the quay when not in use.

Each Eco Hopper is designed to take into consideration the material specifications, the type and size of the grab, the reception hopper dimensions considering the dust control requirements, filter sizing, discharge options, framework, mobility and any specific features required.

Depending on the layout of the port and the material process, the discharge of the material can be made directly to a belt conveyor, into a truck for further transportation, or via a Samson® Material Feeder.

This third option is particularly useful for more cohesive materials that are

difficult to handle and liable to block the hopper.

WHAT KIND OF MATERIALS ARE SUITABLE FOR ECO HOPPERS?

Eco Hoppers are designed to suit virtually any bulk material including: clinker, slag, gypsum, limestone, iron ore, bauxite, coal, copper concentrates, fertilizers, sulphur, biomass, bentonite, nickel ores, soda ash and many others. The exact configuration of the Eco Hopper, discharge options and special features are tailored to suit the material and port configuration. Any naturally dusty material or material which becomes dusty due to particle degradation during transport can benefit from Eco Hopper import. SAMSON Eco Hoppers are used extensively in the cement industry, particularly for clinker import due

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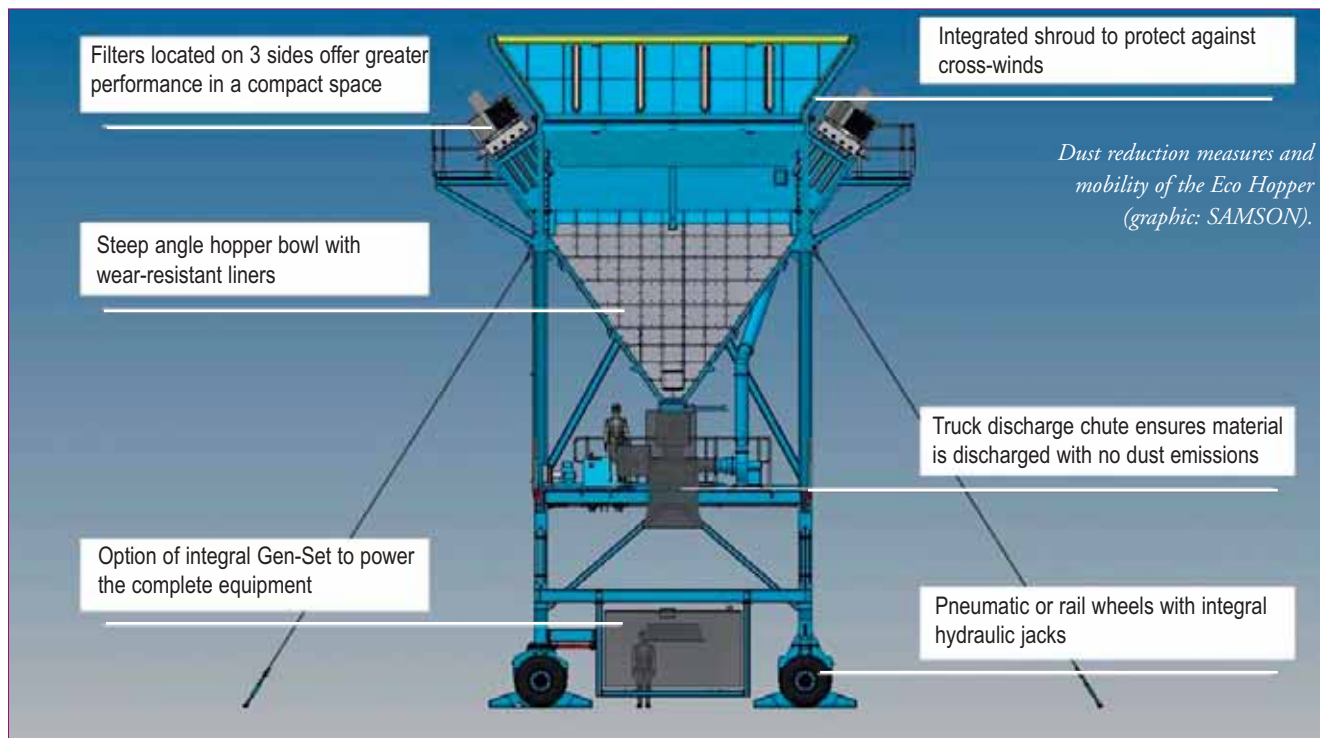
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- Screen Media



to their multiple dust control measures.

MULTIPLE FEATURES TO REDUCE THE SPREAD OF DUST



SAMSON Eco Hopper Inlet Grille (photo: SAMSON).

The SAMSON Eco Hopper possesses a variety of measures to reduce dust emission. The inlet of the Eco Hopper is topped with a metal grille and surrounded by a sturdy metal shroud. Whilst protecting

the hopper from grab impact, this configuration also reduces the effects of crosswinds. Integral filters are positioned around the top of the Eco Hopper in order to extract dust from the localized area and any extracted product is returned to the material flow which in turn reduces waste. The material then enters the lower section through

a dust retention feature called Flex-Flaps. The Flex-Flap system is a series of pressed steel sections attached to vertical rubber flaps. As material passes through the Flex-Flaps the displaced air from the lower

chamber rushes up and closes the flaps, keeping the dust contained within the Eco Hopper. At the discharge point (usually to onward conveyors or through a telescopic truck loading chute) further dust reduction measures such as seals and filters are also employed.

COMMERCIAL ADVANTAGES OF ECO HOPPERS

There are many advantages to the use of SAMSON Eco Hoppers for the importation of dry bulk materials particularly in industries where product demand and supply can fluctuate. Mobile equipment is very important for multi-purpose berths. Dry bulk importers can take advantage of changing market conditions; locate the equipment where needed and quickly set-up for each operation. The Eco Hopper can be quickly inserted into the material reception process without the downtime associated with installing fixed equipment. Investments in Eco Hoppers are also a



Discharging various bulk materials (photo: SAMSON).



Discharging clinker into SAMSON Eco Hopper (photo: SAMSON).

prudent option for multiple-stage developments so, as import facilities evolve, the Eco Hopper can be relocated to a different quay and/or used elsewhere within the port.

The SAMSON Eco Hopper was conceived to be operational as quickly as possible once on site. The modular, scalable Eco Hopper design enables easy local assembly or it can be delivered fully assembled. Once commissioned, regular operation of the Eco Hopper requires minimal pre-preparation allowing the port to react quickly and maximize the operational time.

The dust limitation and waste reduction measures of the SAMSON Eco Hopper design increases the proportion of successfully conveyed material, thus reducing waste and resulting in increased revenue.

By reducing dust emissions in the localized port area operators do not need to spend as much time and money in cleaning up their surrounding facilities. Cleaner facilities improve the efficiency of the overall process as well as the working environment for port personnel.

CONTINUOUS DEVELOPMENT AND INNOVATION

The SAMSON Eco Hopper is designed to be incorporated into the client's existing infrastructure providing a reliable and easy-to-use import method.

While total throughput rates are limited to the performance of the grab crane delivering the material, understanding the client's process and responsive engineering can improve the discharge capabilities and maintain high outputs. SAMSON has developed a variety of methods to discharge efficiently to trucks and ongoing conveyors.

SAMSON Eco Hoppers have an increased filter area to improve dust containment yet this is contained in an incredibly compact filter design. This means that the overall hopper size is relatively small, which frees up valuable space on the quay.

Space and manoeuvrability are also important factors in positioning filters which are situated on three sides of the hopper leaving the sea side free avoiding any obstructions for operation of the grab.

As Eco Hoppers become more efficient in terms of dust reduction and space-saving design they must remain simple to set-up and operate. SAMSON Engineers design for functionality in daily operation and accessibility for preventative maintenance to make the entire process as easy as possible for the end user.

WORLDWIDE SUPPORT

SAMSON Eco Hoppers are in operation worldwide by companies such as LafargeHolcim in the Philippines and

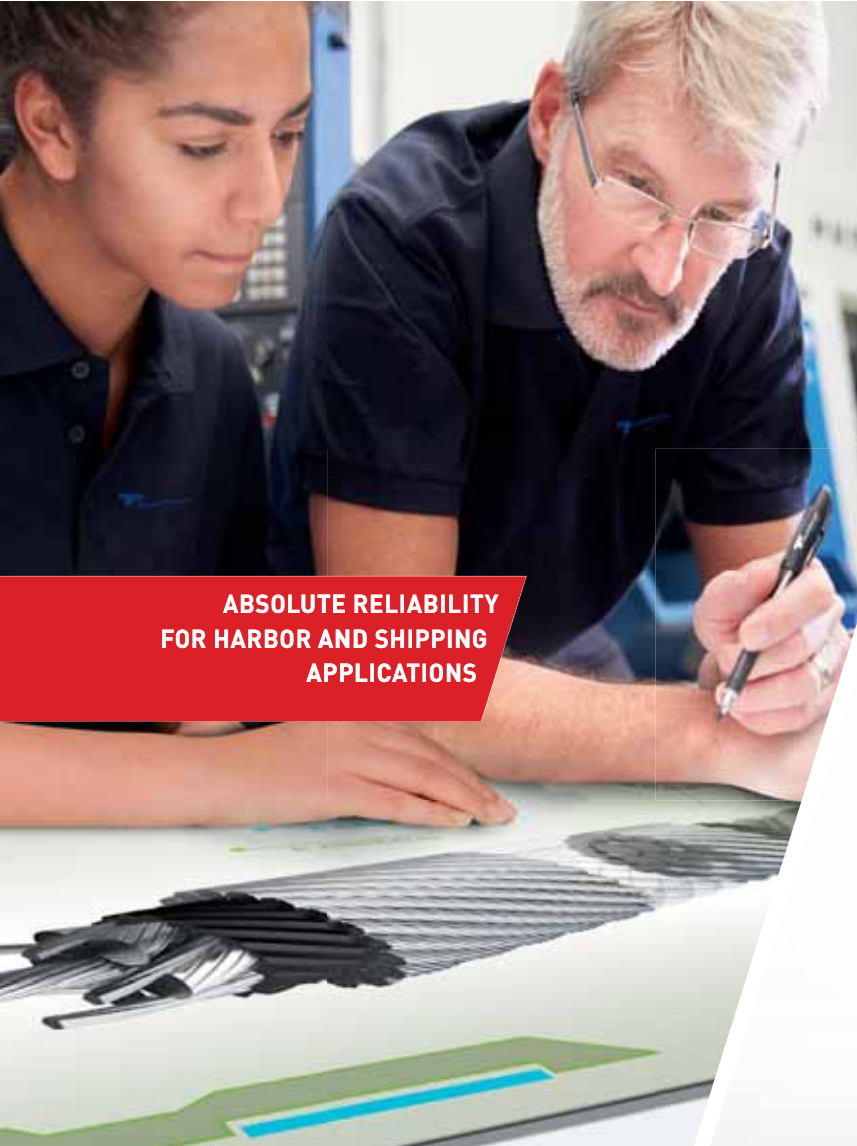
Vietnam, Cement Industries (Sabah), Jurong Port Singapore, SEA-invest in the Ivory Coast and Cimento Apodi amongst others. SAMSON Materials Handling Limited has also designed four Eco Hoppers to be used by the Kenya Port Authority at the Port of Mombasa for its port expansion project currently in manufacturing to be delivered early next year.

SAMSON Materials Handling is part of the AUMUND Group of companies which is active worldwide in the sphere of conveying and storage of bulk materials. Eco Hopper users can be assured of support wherever they are based as the AUMUND Group operates service centres and warehousing for spare parts in Germany, the USA, Brazil, Hong Kong, the UK and Saudi Arabia and has almost 60 dedicated supervisors to tend to clients' needs across the globe.

CONCLUSIONS

SAMSON Eco Hoppers are in use worldwide to provide an environmentally respectful solution to importing dry bulk materials.

Mobile Eco Hoppers provide a host of commercial and environmental benefits to port operators giving them the flexibility to react quickly to evolving market demands. Because of this more and more ports are considering the addition of Eco Hoppers to their import facilities. DCi



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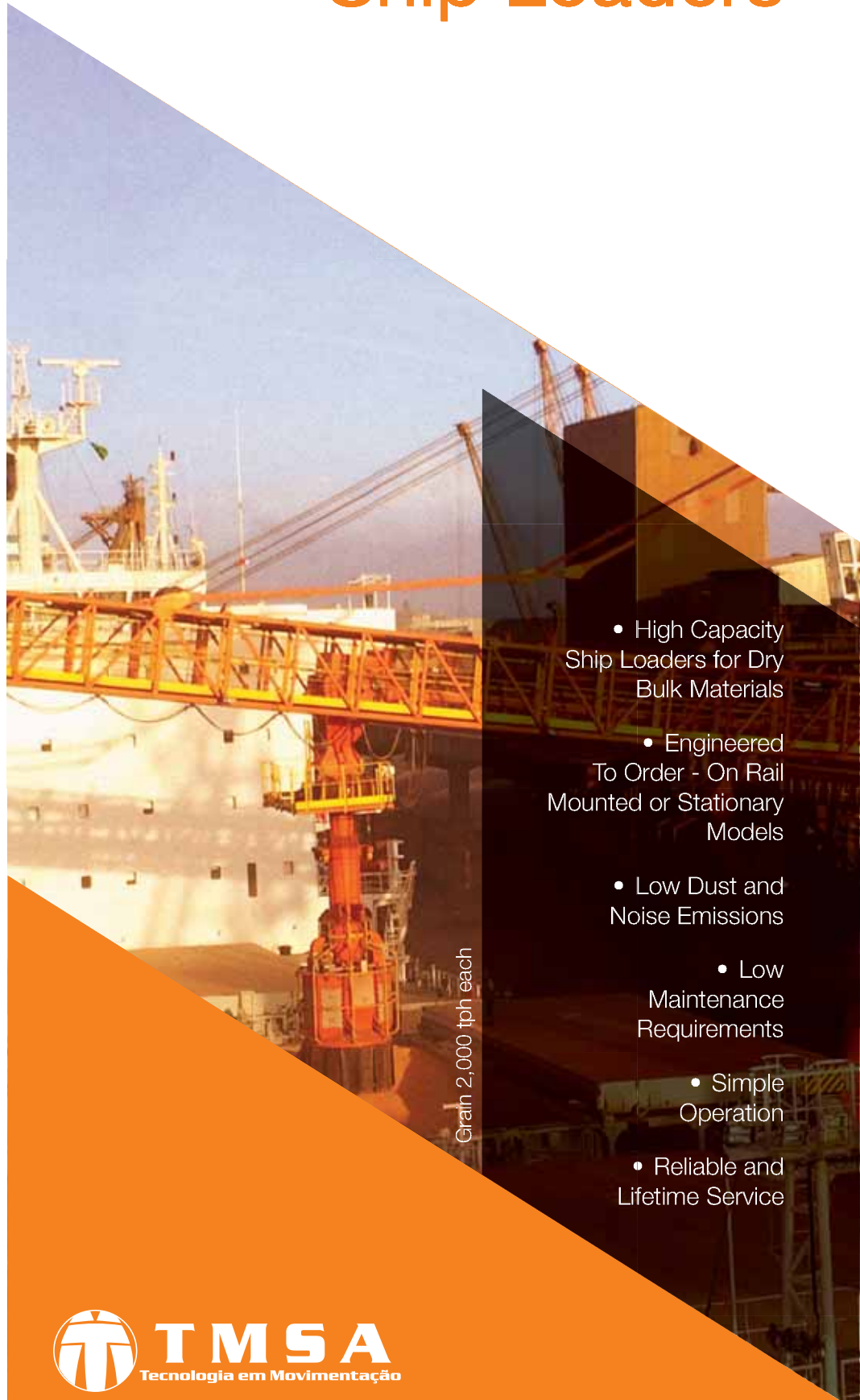
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Fertilizer handling

spreading far and wide

AMECO ET scraper for urea installed at Engro Fertilizers in Dabarki, Pakistan.



AMECO offers expertise in the moving and storage of fertilizer cargoes

AMECO'S ORIGINS

The origins of the French equipment manufacturer AMECO lie in the fertilizer and mining industry. When it was founded, in 1932, the company was part of the Alsatian potash mines. It went from providing them with maintenance services, to supplying them with conveyors, and eventually delivering all types of equipment to fulfill their material handling needs.

To this day, the fertilizer industry remains an important market for AMECO. Its stockyard solutions are able to handle a wide range of solid fertilizers:

- ❖ nitrogen fertilizers (e.g. ammonium nitrate, ammonium sulphate, urea);
- ❖ phosphorus fertilizers (e.g. phosphate rock, superphosphate);
- ❖ nitrogen-phosphorus-potassium (NPK) fertilizers;
- ❖ potassium fertilizers (e.g. potassium chloride, potassium sulphate); and

- ❖ sulphur fertilizers (e.g. calcium sulphate/ gypsum).

The fertilizer industry is known for its strict environmental regulations. These regulations are mainly focused on limiting harmful emissions. AMECO's indoor storage solutions aid fertilizer manufacturers in controlling such emissions and thus complying with such regulations. AMECO offers solutions for both longitudinal and circular stockyards. The latter are particularly interesting where space is limited.

CUSTOMER SUCCESS IS AMECO'S SUCCESS

One of the largest fertilizer manufacturers in the world, Engro Fertilizers, Pakistan, has been equipped with two AMECO machines: an AMECO conical rotary scraper, and an AMECO elevator travelling (ET) scraper. AMECO supplied and

commissioned this equipment to make the handling of Engro's urea operations more reliable, which in turn has led to greater efficiency and lower operational costs.

ABOUT ENGR0 FERTILIZERS

Engro Fertilizers Limited, a subsidiary of Engro Corporation, is a major fertilizer manufacturing and marketing company having a vast portfolio of fertilizer brands optimized for local cultivation needs and demand. Engro is the first company to have setup a urea production facility in Pakistan, a landmark event in the agricultural sector of the economy. This, together with the fact that urea is the most widely used fertilizer in the country, gives Engro a special standing in the domestic fertilizer market.

Engro's fertilizer manufacturing facility in Daharki has been experiencing ongoing

EQUIPMENT DIMENSIONS

	Density	Capacity (ton/h)	Arm length (mm)	Blade width (mm)	Chain speed (m/s)	Motor chain drive	Travel speed (m/min)	Slewing speed (rpm)	Net weight (kg)	Ballast (kg)
Rotary scraper	0.72	160	12,570	700		2 x 18.5		1.4	11,000	
Elevator travelling scraper	0.75	120	18,750	1,000	0.7	22	1.5–8	0.044	60,000	50,000

expansion and has set up the world's largest single train urea plant with a capacity of 1,300,000 tonnes, making Engro Fertilizers poised to become the leading urea manufacturer in the country.

This dynamic company is driven by a vision to improve productivity and lifestyle for thousands of farmers across Pakistan, and AMECO is humbled to be part of this goal of tradition and trust.

AMECO'S EQUIPMENT SUPPLIED

ROTARY SCRAPERS FOR PRILLING TOWERS

Fertilizers such as ammonium nitrate, urea and NPK are commonly manufactured as prills. Prills are formed by allowing drops of the melted prill substance to congeal or freeze in mid-air after being dripped from the top of a tall prilling tower.

AMECO's rotary scrapers are designed

to reclaim fertilizer prills efficiently from the bottom of prilling towers and can be flat prilling tower reclaimers or conical prilling tower reclaimers, designed specifically to fit the shape of the tower floor.

The rotary scraper is composed of a structural boom with scraping blades that rotate around a central point. Rotation is activated by means of a slewing drive, designed as a dual drive system. This system ensures that the scraper can continue to operate, even if one of the drives is undergoing maintenance.

The reclaimer rotates at the bottom of the tower and loads the prills onto a conveyor belt located below a trough installed inside the tower floor.

A conical rotary scraper for urea was installed at Engro Fertilizers in Dahaki,

Pakistan. Engros rotary scraper works around the clock reclaiming the urea prills falling from the tower directly into a downstream conveyor. In this case, the discharge point into the downstream conveyor is located on the centre of the prilling tower base, adjusting to the tower floor by adopting the same angle.

AMECO is a major supplier of rotary scrapers, especially for urea granulation towers, delivering its bulk handling equipment in fertilizer production plants throughout the world.

ELEVATOR TRAVELLING (ET) SCRAPER

The machine begins operating at the end of the stack and, by a pivoting action, lifts the material from the heap and takes it away by means of an underground conveyor or by a bucket elevator fitted to the machine.



AMECO conical rotary scraper for urea installed at Engro Fertilizers in Daharki, Pakistan.

The ET scraper pivots a few degrees left and right at the summit of the stack. As soon as the rake chain leaves the stack, the pivoting action stops, the scraper arm is lowered to a few degrees and the pivoting action is resumed in the opposite direction.

The main advantage of this reclaimer lies in the fact that the stocking area can be used to its maximum. It is designed to reclaim bulk materials from a reclaimer travelling in the pile right up to the roof of the stockyard.



AMECO conical rotary scraper for urea installed at Engro Fertilizers in Dabarki, Pakistan.

AMECO'S SERVICES

Design, engineering and manufacturing for customers are at the heart of AMECO's operations. The company is committed to supplying its clients with excellent after-sales services, wherever they may be in the world. Its service offering includes the following:

- ❖ oversee, organize and co-ordinate the erection, commissioning and/or start-up of AMECO-supplied equipment by a third party contractor.
- ❖ complete erection, installation, and commissioning of equipment from unpacking to the handover;
- ❖ maintenance services by a multilingual team of inspectors and engineers,
- covering all its customers worldwide, including inspections, refurbishment, preventive maintenance and repairs.
- ❖ ensuring clients always have the right spare parts available, not only at the right time and place, but also at the right price; and
- ❖ keeping long lead items in storage for emergency parts.

Monolithic domes: safe fertilizer storage

Fertilizer has always been a commodity in the dry bulk storage industry that has proved difficult to keep, writes *Stewart Ulrich*. The biggest issue storing this commodity is its corrosive properties, often ruining handling equipment. This has long caused headaches and racked up dollars for companies replacing such equipment. There is a storing structure in the industry solving this problem: the monolithic dome.

Monolithic domes are foam-insulated concrete structures which include energy efficiency and storm resistance among their qualities. These structures have been built in locations across the world and for many different purposes: homes, schools, churches, and gymnasiums. Many are built in disaster-prone areas due to their ability to withstand storms such as tornadoes, hurricanes, and earthquakes.

Bulk storage is also a major function of these concrete domes. A variety of different products are stored in monolithic domes, including cement, fertilizer, ammonium nitrate, coal, grains, fruits, vegetables, pesticides, and more. These structures provide a safe and maintainable space for these commodities to be stored.



All photos: monolithic domes storing fertilizer at the El Dorado Chemical Company's facility in Bryan, Texas.

By creating a concrete space around the commodity, they are protected from the outside world. Gary Clark, vice president of sales at the Monolithic Dome Institute, testified to the strength and storage capability of a monolithic dome. "The domes are so immensely strong that with proper design, they are one of the few buildings where you can store ammonium nitrate," he stated.

The reason a monolithic dome is an effective storage structure for fertilizer is because it is insulated. Clark stated that because these domes are insulated buildings, "the fertilizer stores better." He compared it to putting hot water into an insulated water bottle. After time, the water will remain hot inside the bottle. It is the same with fertilizer in a monolithic dome. "As temperature changes, fertilizer

changes properties,” Clark stated. It can harden up and require time to break it up. Another possibility is for the fertilizer to liquefy, which can eat away concrete. “By keeping fertilizer in an insulated monolithic dome, the product stays in a pure state,” Clark said.

Another issue is the corrosive nature of fertilizer, which can ruin the handling equipment. Apart from insulating the structure, another way to combat the corrosiveness is to air-condition the Monolithic Dome. The goal is to moderate the temperature and keep it at a temperate rate. “An air-conditioned building means we lower the humidity inside and remove the moisture,” Clark stated. Doing that removes the corrosiveness of the fertilizer, which means the equipment will last longer. “That is worth thousands,” Clark stated.

Another way to safely store fertilizer is with a monolithic dome blend plant. Instead of a dome that is completely open for storage, these buildings are different. There is an open central area of the dome,



but these structures have different sectioned-off areas around the edge of the dome. The purpose of these separate areas is to be able to store different types of fertilizer without mixing and cross-contaminating. Clark compared it to a box of chocolates, with each compartment holding a different type of the commodity. A small front-end loader is used to retrieve different types of fertilizer from the compartments needed to blend fertilizer for a specific need.

One such plant was built in 2010 in Bryan, Texas for the El Dorado Chemical Company. This facility has two monolithic domes — a large blending plant and a smaller dome for use as a warehouse for various bulk chemicals. The blending plant is a monolithic dome measuring a diameter of 95 feet and a height of 33 feet. It contains eight storage bins and handling equipment.



This type of set-up for a company is valuable and can save money on replacing equipment. The fertilizer product is held well and is less corrosive when stored in this manner. Clark reported that the people at the company are pleased because their equipment is not corroding as fast. Much of the equipment is still in pristine

condition. “In a dome like this, the building is going to last a lot longer,” Clark stated. “The equipment is going to last longer, saving the company a lot of money.”

Storing fertilizer and related commodities safely has become a priority in recent years. One reason for this push was an

incident that occurred a few years ago. In April 2013 a fertilizer plant in West, Texas, USA containing 30 tonnes of ammonium nitrate exploded, killing 15 people and damaging 150 buildings. Since then,

monolithic domes have been built to hold commodities like ammonium nitrate.

The first monolithic dome was a storage dome built in 1976 to hold potatoes. Since then, more than 500 storage domes have been built. They are located in nearly every state in the United States and more than 20 countries around the world.

David B. South, co-inventor of the monolithic dome, started his interest in dome building more than 40 years ago. By 1976, he and his brothers Randy and Barry built their first dome. That project resulted in a patent for the process and launched an innovative construction system for monolithic domes. Several domes have been built around the world, and the uses include homes, schools, churches, and sports facilities.

The Monolithic Dome Institute was founded to promote the dome building industry as a whole. Its purpose is to educate about and promote monolithic domes around the world. Headquartered in Italy, Texas, USA, it holds twice-yearly workshops on how to build domes. The organization also offers concept evaluations and feasibility studies for those interested in building a monolithic dome.



Siwertell wins new fertilizer unloader order for operations near the Arctic Circle



Siwertell, part of Kalmar Business Area within Cargotec, has secured a contract for an ST 490-M ship-unloader from Norway's leading mineral fertilizer producer, Yara International. The new unit will join a long-serving, existing Siwertell unloader at the company's Glomfjord site, ensuring the continued efficient, safe and clean unloading of various fertilizers. The order was booked into Cargotec's fourth quarter 2017 order intake, with delivery planned for June 2019.

"Yara was one of Siwertell's first customers, taking advantage of our unique screw-type unloading concept in 1979," says Peter Göransson, Sales Manager & Senior Advisor, Siwertell. "Its wealth of experience operating a Siwertell unloader, combined with our ongoing support and aftercare were big influences in Yara's decision to once again invest in Siwertell's proven technology.

"Our diverse and lengthy experience with bulk handling systems was also an important factor in winning this contract," he adds.

The new unloader will predominantly handle various types of rock phosphate discharging ships of up to 20,000dwt and maintains a continuous rated discharge of 600tph (tonnes per hour), with a peak

capacity of 700tph.

Norway's stringent environmental regulations meant that in addition to high discharge capacities, Yara needed an installation designed to meet these requirements as well. "Siwertell's screw-type ship-unloader was chosen for its environmental credentials, which include high levels of efficiency and a totally enclosed conveyor system, eliminating dust emissions and spillage," explains Göransson.

"This technology is the only safe and acceptable discharge method that can be used in sensitive marine environments such as a Norwegian fjord, where very strict environmental regulations are in force and air and water pollution is totally out of the question.

"These environmental restrictions, combined with the prevailing high winds at the site, limited the number of options for mechanical ship-unloaders," adds Göransson. "After evaluating other screw-type ship-unloaders, Siwertell's mechanical screw-type ship-unloader with its totally enclosed conveying system was the preferred choice."

Designed to work in the harsh Arctic climate, the unloader is also equipped with an advanced electrical control system,

including the Siwertell monitoring system, known as SIMON; a PC-based human machine interface (HMI), which offers quick trouble-shooting, easy unloader start-up, an analysing tool for problem-solving, a preventative maintenance guide and remote access by Siwertell engineers. A collision protection system against objects on the quay, as well as a CCTV system for safe operation is also included in the unloader delivery.

Using steel structures produced in southern Europe and equipment built in Sweden, the unloader will be erected and commissioned at a southern-European port before being transported by heavy-lift vessel to Glomfjord.

Siwertell ship-unloaders and loaders are based on unique screw conveyor technology, in combination with belt conveyors and aeroslides, and can handle virtually any dry bulk cargo, such as alumina, biomass, cement, coal, fertilizers, grain and sulphur.

Siwertell's product portfolio includes ship-unloaders, mobile ship-unloaders, shiploaders, conveying systems and complete bulk terminal solutions, all of which are designed to ensure environmentally friendly and efficient cargo operations.

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Port of Riga moves towards containerized bulk handling solutions

RIGA UNVEILS 2017 THROUGHPUT STATISTICS: BULK INCREASES WHILE OVERALL VOLUME FALLS

Over the first three quarters of 2017, the Port of Riga has handled a total of 25.5mt (million tonnes) of cargo, 5.1% — or 1.4mt — less than during the same nine months of 2016. The Port of Riga is a multi-functional port handling both dry and liquid bulk, as well as general cargo. Dry bulk is the largest cargo segment of the Port of Riga, amounting to 63% of cargo handled by the port over the first nine months of 2017. As compared to the same period of the previous year, the amount of dry bulk handled by the port has increased by 2% (the volume of general cargo has increased by 9.6%, while the turnover of liquid bulk has dropped by 32.9%).

The Port of Riga maintains its leading position among the ports of the Baltic States in terms of handled volume of dry bulk. The Port of Riga is the second-largest dry bulk port in the entire Baltic Sea,

behind the Russian port of Ust-Luga, which has been developing extremely fast in recent years due to the Russian policy of transferring cargo of Russian origin only to its own ports.

Over the first three quarters of this year, the Port of Riga has handled a total of 16mt of different types of dry bulk. According to Q3 2017 results, the largest group of dry bulk at the Port of Riga is coal, mineral fertilizers, wood pellets, grain and grain products, metals and wood chips.

Coal is a transit cargo at the port of Riga, which is 100% received by rail from Russia. The Russian transport policy in recent years envisages transferring all cargo only to its own national ports and fully closing cargo transit via the Baltic States' ports. However, despite this policy, this year's volume of coal handled by the Port of Riga has increased by 2.5% compared to 2016. Overall, 9.3mt of coal were dispatched from Riga this year.

The second-largest group of dry bulk at the port of Riga is mineral fertilizers. Mineral fertilizers are handled at two specialized port terminals and are 100% received in transit from Russia. Over the first three quarters of this year, the Port of Riga has handled 1.8mt of mineral fertilizers, which is 12.3% less than a year before.

As compared to the previous year, the total volume of dry bulk timber handled by the port over the first nine months of this year has increased by 9.7% and 1.8mt of cargo has been dispatched from the port. Dry bulk timber is an export product of Latvia and an increase therein also suggests an increase in the Latvian wood processing sector. An increase in handled cargo, compared to the previous year, has been registered for woodchips (+13.5%) and sawn timber (+77.9%), while stagnation after the fast growth of the previous year is seen in the wood pellets segment (-4.5%).



Containerized dry bulk handling is often called a revolution in dry bulk logistics and the Port of Riga is the first port in Europe to use the technology.

Grain cargo in Latvia is both of local origin and received in transit from neighbouring countries, i.e. Lithuania, Russia and Belarus. Taking into account the unfavourable effects of this year's weather conditions on crop harvesting in Latvia, handling of grain products at the port was actively commenced only in the second half of September. Despite that, 261,800 tonnes of agricultural products were handled in September, a new monthly record. Overall, the volume of grain products over the first three quarters of the year has remained at the same level as the previous year.

Over the first three quarters of this year, the total volume of dry bulk metals (ore, metals, scrap metal and ferroalloys) has increased.

PORT OF RIGA INTRODUCES NEW AND INNOVATIVE DRY BULK HANDLING TECHNOLOGY

As part of its ongoing development of the terminal, and in order to increase the effectiveness of cargo handling, the company Riga Universal Terminal Ltd. (RUT) has introduced a new technology: containerized dry bulk handling. This technology is often called a revolution in dry bulk logistics and the Port of Riga is the first port in Europe to use it.

The company RUT is currently using the containerized handling method for handling

wood pellets on large dry bulk ships. Pellets are delivered from warehouse to pier in special-purpose open-top 20-foot containers. Using a portal-frame container lift equipped with a revolutive system (revolver), the entire contents of a container are delivered onto the ship by turning the container over into the holds.

Atis Šulte, RUT Trade and Business Development Director: "The main benefit from introducing the new technology is significant optimization of terminal expenses and increase in performance. Now, we can perform dry bulk handling operations involving a significantly smaller number of machinery and human resources. Savings on resources amount to almost 50%. By introducing containerized cargo handling, we have become more competitive and can better adjust to customer requirements. Following the general tendency in cargo carriage, dry bulk ships handled at our terminal are becoming even larger. By means of the new technology, we are able to ensure fast and effective loading of large ships. By applying the new technology, we are able to load dry bulk and containers at the same pier, using one portal-frame lift. It allows us to quickly organize our work in the terminal and quickly handle any type of ship".

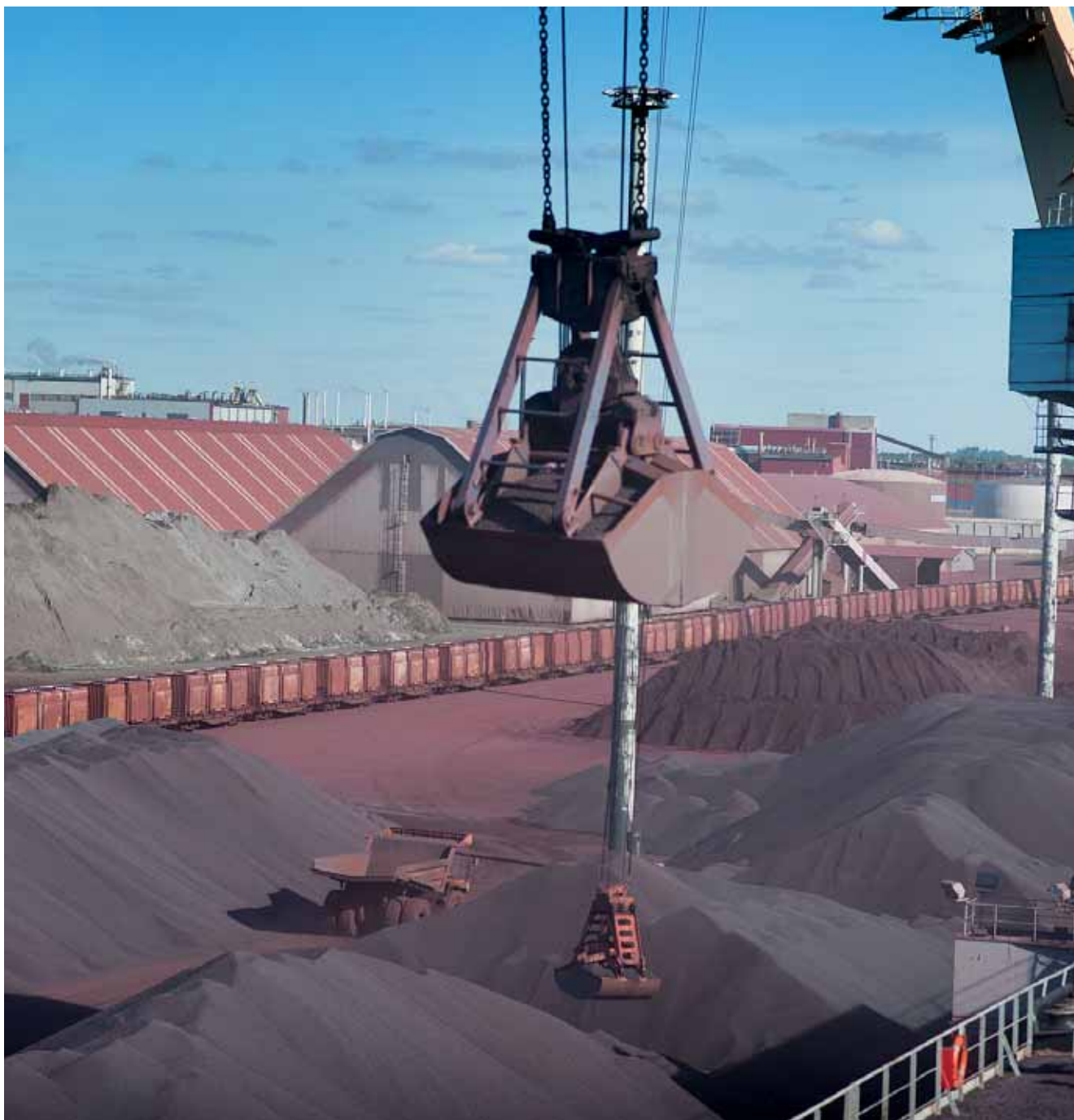
Containerized dry bulk handling is also

an environmentally-friendly technology. Cargo is practically poured into the holds, rather than above them, which reduces the amount of dust that ends up in the air. Likewise, spread of dust and cargo losses are reduced by handling a great amount of cargo within one lifting time.

This method of containerized dry bulk handling is used in the ports of Australia and South America, where it is used with the logistics of mining industry products, i.e. metal ore, coal, as well as grain. This technology is called a revolution in dry bulk logistics, since by using closed standardized containers, dry bulk can be transported from the place of extraction, stored at the terminal without unloading from the container and loaded onto the ship using the same container. As a result, no investments are needed for warehouses and the entire logistics chain from extraction to loading onto a ship can be optimized, using standardized containers and equipment which has been developed and is already used in container cargo logistics.

(For more details on RAM Spreaders' work in containerized bulk solutions, please see 'Flexible containerized bulk attachment works with multiple lifting equipment,' on p54-55 of the August 2017 issue of *Dry Cargo International*: Ed.)

Port of Kokkola: general port continues to grow and develop



The Port of Kokkola is the third largest general port in Finland. Cargo traffic through the port has experienced powerful growth thanks to development efforts characterized by long-term and thorough planning.

The most important success factors of the port are, among others, customer-friendly service, competitive pricing and investments in modern cargo handling equipment. The Port of Kokkola is the preferred and foremost port in Finland serving the mining industry. The expertise of the logistics required by the mining industry is based on a co-operation that goes back more than 50 years. In addition to the mining industry, the Port of Kokkola is an important actor in the transit traffic

from and to Russia.

The third significant customer group is the industry and the local trade in Kokkola. In the close vicinity of the port the industry concentration of Kokkola Industry Park (KIP) is established. This Industry Park is the largest concentration of non-organic chemical industry in Northern Europe. More than 60 companies are established in the area, employing more than 2,000 persons. Major investments have also been made in the Industry Park.

In the first half of this year, the increase in cargo transport in the Port of Kokkola is over 16%, driven by foreign exports.

This year, the Port of Kokkola has also achieved "The strongest in Finland" certificate. This kind of certificate is only

achieved by companies which obtain the high Rating Alfa credit classification. This certificate is only awarded to every tenth company in Finland. The classification is awarded by Suomen Asiakastieto Oy.

PORT OF KOKKOLA OPENED AN OFFICE IN MOSCOW

The Port of Kokkola is developing and expanding its activities in Russia and CIS countries. In early October this year, the Port of Kokkola LTD opened an office in Moscow. With the help of the Moscow office, the Port of Kokkola will develop partner relations with Russia, and will be able to respond quickly to the needs and demands of Russian clients.

Kauko Tanninen will be the representative of the Port of Kokkola in the

co-operation and development of partner relationships in Russia and the CIS countries.

Tanninen has more than 20 years of experience in Russia in many industries, including mining and logistics.

Tanninen describes the activities in Russia in the following way: "In Russia it is extremely important to dare and to establish business relations, to listen and discuss about arguments, to own and create many personal contacts. Here, the quality and honesty of Finland and the Finnish mentality are valued, and it is very important to create trust between the client and the supplier. When the services, which are offered, are good, then it is an honour for me to provide them — and Port Kokkola is an excellent example of excellent port services."



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Record results for the Port of Gdansk in Poland



Port of Gdansk end 2016 with a record in the use of land transport

Last year, the Port of Gdansk handled a total of nearly half a million trucks and almost 240,000 railway wagons. In comparison to 2015, this was a leap of 43% in the case of trucks, and of 24% in terms of the intensity of rail traffic. This result in terms of land transport traffic is the best ever for the Port of Gdansk.

After summarizing the 12 months of 2016, the Management Board of PGA (Port of Gdansk Authority) can announce record data relating to the use of overland transport. Last year, on average, one loaded truck was handled in the port every minute, and a goods train every 1.5 hours. Regarding the average load of both means of transport, it is estimated this was slightly lower than last year, but the differences are relatively small.

In comparison with the data from four years ago, truck traffic in the port in 2016 increased by 100%, and rail traffic recorded an increase of nearly 40%. The current dynamics confirm the large increase in the importance of Gdansk in the operation of overland transport.

MOST TRAFFIC IN THE OUTER PORT

In 2016, the Outer Port accounted for three-quarters of the traffic. The share of

individual means of transport in overland freight handling in Gdansk was 31% for railways, 29% for trucks and 40% for pipeline transport. The latter has seen an 8% drop in the share structure, with an increase of 5% in truck traffic and 3% in the share of rail transport in overland freight handling.

Truck traffic was mainly used to transport general cargo (containers) as well as bulk cargo such as aggregates, chemicals and grain. Rail was used to transport primarily coal, containers and loads of chemicals, including fertilizers.

Regarding coal, it should be noted that in the past year a change in the directional structure of freight handling has taken place. Although rail transport still dominated, the number of trucks picking up raw materials from the port and transporting them into the country increased by as much as 45%.

BENEFITS OF THE NEW RAILROAD BRIDGE ACROSS THE MARTWA WISLA

According to estimates collected from port operators, the newly built railway bridge over the Martwa Wisla was crossed by a total of more than 5,600 trains, which equates to more than 220,000 wagons. In making the calculations, the operators did not take into account trains which crossed

the bridge without goods. Average daily rail freight traffic amounted to around 15 trains a day, or more than 620 wagons a day.

The achievement of such a result is pleasing, all the more so because during two quarters only one track was in operation on the bridge. The second track was opened in the third quarter of 2016.

The bridge was most intensively used for the transport of containerized cargo, which in the past year increased by more than half in terms of tonnage in overland traffic. This automatically led to a rapid increase in the amount of land transport used to handle freight at the port.

PORT OF GDANSK AS A LOGISTICS HUB

Detailed analysis of overland traffic in the port clearly demonstrates the growing importance of Gdansk as the logistics hub of the country. Each day it handles over 1,300 trucks loaded with goods, and more than 650 full wagons, most of which usually travel to or from the port without load. Thus, in practice, this means almost double the traffic compared to average daily levels.

This year, the Management Board of PGA expects consistent growth in land traffic and is taking action to stimulate further development in this field. The aim of the Management Board of PGA is to create favourable conditions for the further

development of logistics operations in the port, which will translate into higher growth of transshipments, resulting in strengthening the position of the Port of Gdansk.

Record transshipments at the Port of Gdansk: higher than expected

Yet another record result in transshipments at the Port of Gdansk. After the first eight months of 2017, the result has improved by 3.7% compared to the same period of the previous year, and at the same time, is higher than predicted. By August, as many as 25,501,876 tonnes of various types of goods were transshipped at the largest Polish seaport. It is worth mentioning that the upward trend is particularly noticeable in the container transshipment sector.

In the period from January to August 2017, the Port of Gdansk exceeded the adopted transshipment plan by 0.7%. The volume of goods handled included mainly imported commodities (63.3%). This good August result is mainly owing to the transshipments of containerized general cargo, fuels (mostly oil), and coal. In August alone, over a quarter more general cargo was transshipped than in the same month of last year. Importantly, this year's first transshipment of ore took place as well. Between January and August 2017, a total of 25.5mt (million tonnes) of cargo was transshipped. It is a continuation of this year's trend of record transshipments — already within

the first half of the year, the Port of Gdansk recorded the best result in its history, achieving a value several percent higher than in the same period of 2016.

“In terms of transshipments, this year shows how dynamically the Port of Gdansk is developing. We owe high transshipment values primarily to general cargo, also of the Ro-Ro type. Within the last eight months, we have handled 373% more commercial vehicles than last year. We are particularly happy about exceeding the plans adopted for 2017. We hope that the coming years will bring even better results and that we will increase transshipments in the less popular categories, such as cereals,” says Lukasz Greinke, President of the Board of the Port of Gdansk Authority SA.

Even though, this year, many ports recorded fewer vessel calls for regular links, the Port of Gdansk handled a record volume of containers. Importantly, at the beginning of September, another super large container ship from the OOCL fleet was christened. OOCL Japan will sail regularly between Gdansk and the ports of the Far East. The shipowner's newest and largest container vessels will be gradually put into service both this year and in 2018. Everything seems to confirm that 2017 will be a record year in the container cargo group.

The Port of Gdansk is one of the largest and most important enterprises in Poland. It is one of the most thriving ports in the Baltic Sea. It is of fundamental significance to the national economy and constitutes a key international distribution hub.



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NK TEHNOLOGIJA plays vital role in coal terminal relocation project

Back in the year 2001, NK TEHNOLOGIJA started operations with a principal focus on servicing harbour cranes, providing all necessary repairs, maintenance, retrofitting, assembling and dismantling for brand new or used lifting equipment.

Since then, dry bulk commodities (coal, grain, fertilizers) handling terminals remain the company's major clients and NK TEHNOLOGIJA has improved and developed its scope of supply, now offering turnkey projects for designing, manufacturing, delivery and

installation of bulk handling equipment, such as shiploaders, mobile ecological weighing hoppers and tilting spreaders.

With the loyal customers all across the Baltics, including, but not limited to the sea harbours of Hamina Kotka (Finland), Tallinn (Estonia), Ventspils (Latvia), Klaipeda (Lithuania), Sankt

Petersburg, Ust-Luga and Kaliningrad (Russia), NK TEHNOLOGIJA pays tribute to the capital city of Riga, where the company has been residing since its very foundation, taking part in the local harbour's development programme of the Krievu sala industrial area.

This is a major infrastructure project

involving the relocation of the coal terminals further away from the tourists attracted by the city's downtown and residential areas. The project is supported by EU funds, and scheduled to be finalized by the end of 2018.

NK TEHNOLOGIJA is taking an active part in the Krievu sala project, developing technological concepts for the coal handling process improvement in the area, providing its expertise on the basic equipment selection and offering solutions on the environment protection issues.

The company's scope also includes the supply of the rail-mounted mobile shiploader with a tripper car, to handle the coal cargoes with a loading rate of 2,000 metric tonnes per hour. This brand new piece of a modern and high-capacity harbour machinery, contracted a year ago, had already been commissioned and handed over to the customer (the enclosed SLL2000 shiploader can be seen in the photographs).



Hydraulic drives – a perfect solution for bucketwheel reclaimers



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

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

HYDRAULIC DIRECT DRIVES AND THEIR USE

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

The advantages of using direct hydraulic drive systems for powering bucketwheel reclaimers are quite apparent. Its controllable variable speed optimizes the machine capacity, while overload protection and high starting torque

increases the availability considerably. In addition, the highly reliable drive system for the bucketwheel features such a low weight that the load on the slewing machinery significantly reduces. This leads to both higher uptime as well as less need for maintenance.

OPTIMIZING MACHINE STRUCTURE

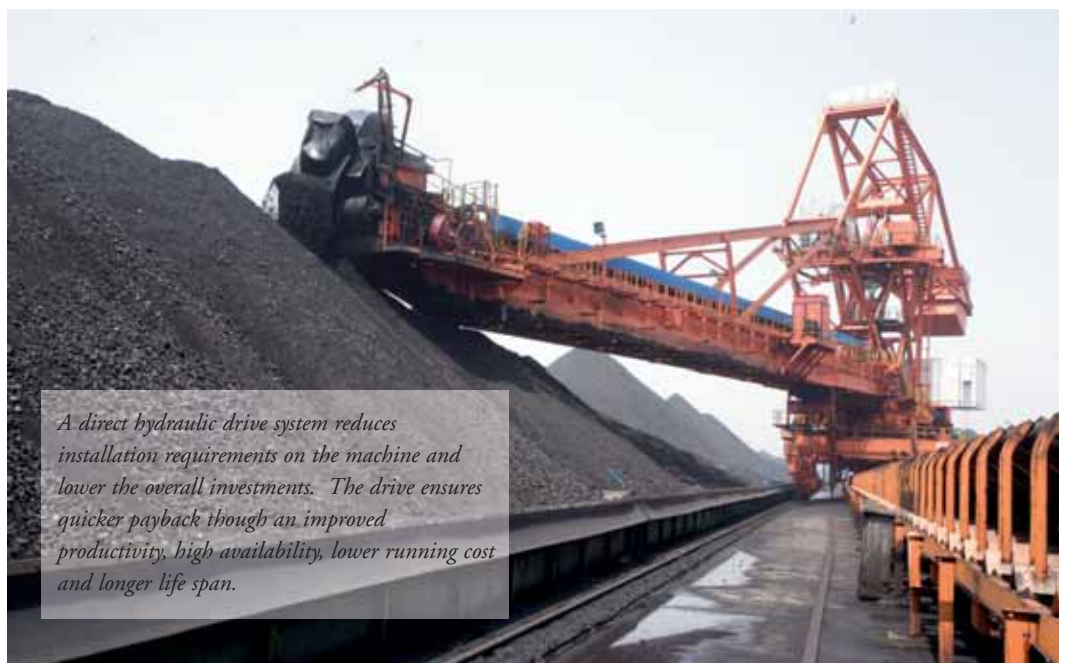
The weight of a hydraulic motor, attached directly to the bucketwheel shaft, is much less compared to that of an equivalent alternative drive that often consists of more components and a more complicated mounting. Evidently, this weight reduction on the end of a 30–60m boom have a significant influence on the overall machine design. The drive unit can be located on the boom, closer to the machine centre, or on

the slow deck.

Compounding the weight reduction with the low inertia of the drive and the subsequent reduction of shock loads, there are many heavy arguments for using a hydraulic direct drive system in the design of a bucketwheel reclaimer machine.

MEETING THE NEEDS

Another strong argument for using a hydraulic direct drive on a bucketwheel is the versatility offered by a variable speed drive. The ability to vary the bucketwheel speeds depending upon different materials and conditions means that capacity can be optimized. The possibility to monitor the bucketwheel torque condition and relate such information to the slow control offers considerable advantages.



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

How a direct drive system works

Hydraulic direct drive systems consist primarily of a hydraulic motor directly mounted on the driven shaft and a drive unit including a control system. The drive unit comprising a fixed-speed AC induction motor and a variable displacement hydraulic pump. This drive unit provides a variable flow of oil to the hydraulic motor in response to a control signal, enabling the speed of the hydraulic motor to be adjusted for every possible need.

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

reclaimers – both for new machines and for retrofit upgrades.

COMPLETE SCOPE OF DRIVE SOLUTIONS FOR ALL FUNCTIONS

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

KEY HYDRAULIC DRIVE BENEFITS FOR BUCKETWHEEL RECLAIMERS

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



Hydraulic direct drives offer unbeatable 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.

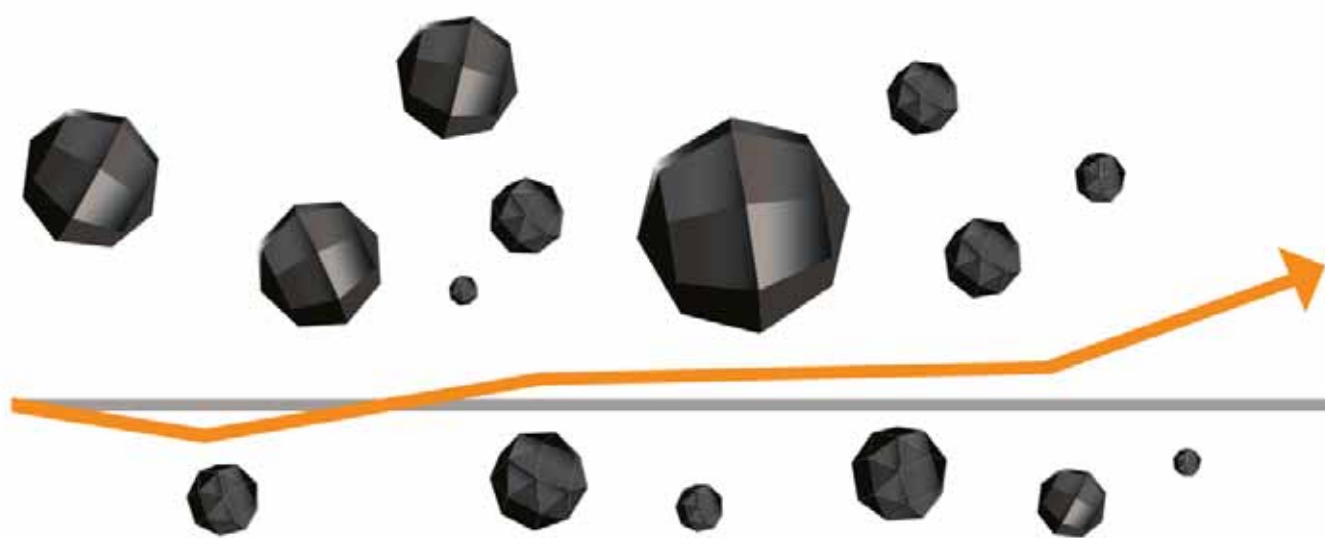
Hydraulic direct drives are well adapted to the general conditions in mining and materials handling. Partly due to their



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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 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.

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; and
- ❖ perfect load sharing when two or more hydraulic motors are used on one pulley or for multi-pulley conveyor design.



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Hempel unveils new coatings and primer for the shipping industry

HEMPEL LAUNCHES NEW GLOBIC 9500 SERIES

ANTIFOULING COATINGS: OUTSTANDING RETURN ON INVESTMENT AND FLEXIBILITY

At the end of October, major global coatings manufacturer Hempel launched two new premium antifouling coatings, Globic 9500M and Globic 9500S. The coatings offer customers a potential 2.5% reduction in speed loss. This equates to significant fuel savings and lower CO₂ emissions improving the operational efficiency of a vessel and minimizing the operator's environmental footprint.

This next-generation coating series builds on Hempel's proven Globic technology to deliver superior antifouling performance for new buildings and dry-dockings, delivering an outstanding return on investment and flexibility from outfitting through the entire docking interval.

Hempel's patented Nano acrylate technology is the strength behind the Globic range and provides a fine polishing control mechanism to bring the integral biocides to the surface at a stable rate ensuring a clean hull.

By combining the strongest binder and biocide package for premium performance at different trading speeds, Globic 9500M and Globic 9500S outperform other self-polishing coatings (SPC) particularly when slow steaming.

Henrik Dyrholm, Global Product Manager, Hempel A/S says: "Globic 9500M (M for maintenance) is designed to protect against slime as well as soft and hard fouling in all conditions. Globic 9500S (S for static) is designed to protect against hard-fouling even during extended outfitting periods. Together these two coatings deliver unparalleled anti-fouling protection offering our customers improved operational efficiency, flexibility and a high return on investment."

"Our Globic range has been very well received in the market and since its launch in 2005, over 25 million litres have been delivered worldwide with more than 5,000 vessel applications achieved. Our new coating series is the next step in high performance antifouling protection".

Additionally, the patented microfibres incorporated in the paint give Globic 9500M and Globic 9500S a best in class mechanical strength to avoid cracking and peeling. Globic's unique technology allows it to start working as soon as the hull meets the water for full and immediate antifouling protection, making it highly efficient even for slow steaming and long idle periods.

Globic 9500 Series at a glance:

- ❖ lasting protection against all kinds of fouling — designed for 60+ months docking intervals;
- ❖ suitable for all vessels at all speeds;
- ❖ incorporates proven patented Nano acrylate technology;
- ❖ patented microfibres for best-in-class mechanical strength to avoid cracking and peeling;
- ❖ outperforms other SPC, particularly during slow steaming;
- ❖ excellent colour stability; and
- ❖ Nano acrylate technology.

The new coatings incorporate specially designed water-activated Nano acrylate technology that uses nano capsules to control polishing. When seawater comes into contact with the nano capsules, it penetrates the hydrophobic outer shell. The hydrophilic inner core chemically hydrolyses and then expands which breaks through the outer shell, enabling controlled polishing. Consistent self-polishing and a constantly thin leach layer ensure uniform biocide release over the entire docking interval. Unlike other premium antifouling technologies, Nano acrylate technology provides immediate antifouling protection without the need for water friction.

Special microfibres reinforce the binder, providing a skeleton effect that gives the coating enhanced mechanical strength and makes it more resistant to cracking.

HEMPADUR AVANTGUARD 860 CHALLENGES

TRADITIONAL ANTICORROSIVE COATINGS

Also in late October, Hempel launched its new versatile activated zinc primer, Hempadur Avantguard 860. This product combines best-in-class corrosion protection, at the level of an inorganic zinc silicate, with the application benefits of an epoxy.

Hempadur Avantguard 860 is specifically designed to protect steel structures in moderate to severe corrosive environments. It is the first of its class, specifically developed to overcome the problems experienced with zinc silicate primers application, without compromising corrosion protection and boosting productivity.

In response to general industry concerns over curing times and application properties of zinc silicates, Hempel's new product, with a recoating interval of just one hour, offers at least four times faster drying than coating systems based on zinc silicates. Highly flexible and versatile, this new coating can be applied year-round and at temperatures down to 14°F/-10°C, and

with no restrictions on minimum relative humidity.

Oriol Osso, Group Product Manager, Energy, Hempel A/S says: "At Hempel we constantly push ourselves to better meet the needs of our customers. Owners of assets in harsh environments demand the highest quality in corrosion protection. Applicators want a product that will help boost productivity. Hempadur Avantguard 860, based on Hempel's proprietary activated zinc technology, delivers all this. We've further developed our ground-breaking Avantguard technology to reduce curing times and this saves time for applicators and for asset owners."

"This new product further redefines anti-corrosion coatings to deliver best in class protection at a level the market expects from an inorganic zinc silicate (IOZ) but with the added application benefits of an epoxy. Avantguard 860 is the true challenger to inorganic zinc silicates."

Hempadur Avantguard 860 is a SSPC Level I-compliant two-component activated zinc rich primer, that delivers excellent protection in severely corrosive environments. It incorporates Hempel's patented Avantguard technology offering a unique combination against corrosion, providing improved barrier, inhibitor and galvanic protections in a single coating for all-round performance.

HEMPADUR AVANTGUARD 860 AT A GLANCE:

- ❖ certified to the highest anticorrosive test requirements including NORSOK M-501 Ed.6 System I, ISO 12944-6 Part 5, and Level I type II in SSPC Paint 20 2002 standards;
- ❖ based on Hempel's advanced and proven Avantguard technology;
- ❖ fast drying: at least four times faster than zinc silicates — a three coat system can be applied in a single shift;
- ❖ high mud cracking resistance — two times better than coatings with inorganic zinc silicates;
- ❖ flexible application — wide application temperature range, can be applied in temperatures down to 14°F/-10°C; and
- ❖ no need for a mist coat as required for inorganic zinc silicates.

ABOUT HEMPEL

Since 1915 Hempel has been a world-renowned coatings specialist. Today, it has over 6,000 people in 80 countries delivering trusted solutions in the protective, decorative, marine, container, industrial and yacht markets.

NORDEN's customers benefit from faster response times

The nine new and independent teams in NORDEN's Dry Cargo Department have been in operation for a few months. "Our experience so far is very promising," says Gregers Blaabjerg who is Head of Supramax North America and who is motivated by the increased level of responsibility that comes with the independence.

Blaabjerg is in charge of Supramax North America — one of the nine new teams — which, with the new set-up in the department, is authorized to make decisions on its own resulting in increased responsibility and transparency regarding the results generated by the team. And transparency does not just apply when the team makes good results but also when the results are less attractive.

"The high level of independence is highly motivating for the team — including me. We have a very direct relationship with our customers and the business we make. I know that I and the team have full responsibility for the transactions we make. Each team is an independent profit centre. In the previous setup, there was a smaller degree of transparency in results and it was consequently difficult to quantify good and bad decisions. The increased sense of ownership creates a foundation where everyone in the team does his or her best. This is to the advantage of our customers, but definitely also to NORDEN," says Blaabjerg.

NEW STRATEGIC VENTURE

The objective of the new set-up with a simplification, enforcement and empowerment of the entire Dry Cargo Department — with approximately 150 employees distributed on the head office in Hellerup, Denmark and the overseas offices in Singapore, Australia, China, India, the USA, Brazil and Chile — is to implement NORDEN's strategic decision on significant organic growth by means of increased operator activity, i.e. the combination of cargoes with chartering in of available tonnage in the market.

Furthermore, the new set-up with a strong customer focus will underpin NORDEN's Corporate Soul Purpose which states that NORDEN works at contributing to more efficient and sustainable global trade, where every person and action matters.

FASTER AND MORE AGILE

Blaabjerg's team consists of six charterers and four operators — five charterers and



Gregers Blaabjerg, Head of Supramax North America.

one operator are located at the head office while the other members of the team work at the office in Annapolis, USA.

A very concrete result of the high level of independence and thereby power to make business-related decisions, which previously had to be evaluated by managers further up the hierarchy, is that the team is much more agile — i.e. the work procedures are fast, flexible and able to adjust to the customers' individual needs as a matter of course.

"When a customer has made a shortlist of the shipping companies, which he considers reliable and able to deliver a service of a high quality, it is decisive for him that we are not only able to provide him with a competitive price for transporting his cargo, but that we are also able to quickly provide him with the price. At the other end of the line, he is in contact with the customer, whom he will deliver the cargo to, and to calculate the total price of the cargo, he needs to know the transport costs.

"All experience demonstrates that the faster we are able to provide a binding quotation, the more likely we are to obtain the cargo contract. That is the short-term advantage. In the long term, our ability to provide a potential customer with a fast and not least binding quotation increases our chances of being contacted the next time he needs a quotation for a transport," says Blaabjerg.

WELL-DEFINED FRAMEWORK

Although the nine new teams covering the vessel types in the Dry Cargo Department — Post-Panamax, Panamax, Supramax and Handysize — have a high level of

independence, this is practised within a well-defined framework which has been determined based on the department's risk management. In short, it sets out to determine how much exposure is acceptable within the different vessel types and in the different markets based on a risk assessment.

"Based on the framework provided for us, it is our task to independently utilize the business opportunities in the best possible way. This requires thorough and in-depth market knowledge, which each of the nine teams must gain independently. Of course, we also have to keep updated continuously in order for us to always know how a market is expected to develop over a two- or three-month period and thereby be able to act accordingly. We have to gather knowledge on e.g. North American grain exports for the year, but at the same time be close to the supply side with regards to tonnage, thereby allowing us to be capable of acting correctly. For that reason, it is necessary to be deeply engaged in your market at all times," says Blaabjerg.

Only if the individual teams get too close to the edge of the commercial opportunities and their associated risks, will management interfere.

ABLE TO INCLUDE ALL ASPECTS

He mentions another advantage of the new setup, which is that the charterers in the nine teams work much closer together with the operators due to the fact that the team also includes the operators who perform the execution of the transports.

"This significantly increases our chances of remembering to include all aspects when we assess a business opportunity, and it strengthens our focus on optimization of current voyages," says Blaabjerg.

TRUST IS CRUCIAL

He says that trust between colleagues is a crucial factor in making the co-operation in a team work.

"Trust is a prerequisite if we want to be open with each other and be capable of receiving not only praise — which is typically not very difficult to receive — from each other, but also criticism, which is not always easy to receive and handle. In order to be efficient and give our customers the best possible service, we have to be able to discuss all subjects in the teams — also the cases where we have not performed well. And when you have not performed well, there is usually a lesson to be learned," says Blaabjerg.



CAN DRAW ON THE WHOLE OF NORDEN

Although all nine teams in the Dry Cargo Department are specialized and deeply focused on each of their own business areas, it will also be necessary to draw on the knowledge rooted outside the team, more accurately knowledge which is accessible in the newly established knowledge centre in the department.

The knowledge centre is manned by colleagues, who are experts within risk assessment, market analysis, fuel efficiency and law. The centre is located in the middle of the Dry Cargo Department, but never further away from charterers and operators — including the ones at the overseas offices — than the nearest computer or phone. The centre serves as a resource for all teams.

“It is of great advantage to us that we are able to draw on the knowledge gathered in the centre — not least the Fuel Efficiency team, who provides us with many relevant pieces of information when we are

to charter in a vessel, and who prevent us from burning our fingers because we get hold of a vessel which consumes too much fuel.

“It strengthens the work in the team to know that although we are independent, we have the great advantage that we are part of NORDEN, and I mean the entire NORDEN. We can always draw on other colleagues, who have the exact knowledge — or can quickly gather it — that we are after in connection with a future business transaction,” says Blaabjerg.

SPECIAL FOCUS AREAS

Every member of team Supramax North America has special focus areas and the purpose is that the team is to gather as much in-depth knowledge as possible in order to get the greatest overview and consequently the best foundation for doing profitable business, which encourages the customers to come back. Again and again.

“My task is to have the overall and

coordinating focus on all areas of relevance to our team, and I furthermore focus on the team, the customers, the brokers and the strategy,” says Blaabjerg.

Team Supramax North America comprises:

- ❖ Mark Kuehl (Annapolis, charterer);
- ❖ Anne-Sophie Tinsfeldt (Hellerup, charterer);
- ❖ Nanna Sinding Brage-Andersen (Hellerup, charterer);
- ❖ Jens Christian Westergaard (Hellerup, charterer);
- ❖ Mathias Graae Pedersen (Hellerup, charterer);
- ❖ Mette Stenild Grøn (Hellerup, operator);
- ❖ Andrea E. Sørensen (Annapolis, operator);
- ❖ Kristofer Bisci (Annapolis, operator);
- ❖ Andreas Rindom (Annapolis, operator); and
- ❖ Gregers Blaabjerg (Hellerup, head of the team).

DCi



100%
rPET
Flakes

FROM BOTTLE TO BIG BAG

rPET FIBCs – the sustainable solution for bulk material logistics!

Made from 100 % recycled PET bottle flakes or pellets, rPET FIBCs feature high creep resistance, long-term form stability, less bulging, excellent abrasion resistance. Perfect for hot-fill and food-grade applications, rPET FIBCs can be used as high-performance big bags and are a cost-cutting alternative to FIBCs such as octabins or drums. Fully recyclable and reusable.

Visit us at:
Plastimagen, Mexico City, November 7 - 10, Booth 414 and 830




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Starlinger Head Office:
Sonnenuhrgasse 4, 1060 Vienna, Austria
T: + 43 1 59955, F: -25, office@starlinger.com
www.starlinger.com
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textile packaging | consumer bags | recycling technology | viscotec

Bag check

what's new on the market?



The first ten-shuttle loom of its kind, Starlinger's FX 10.0 is designed to produce heavy-duty fabric out of PP and HDPE fabric for demanding packaging applications such as FIBCs.

Starlinger: machinery for the production of heavy-duty woven packaging for dry bulk goods

Starlinger is a machinery manufacturer which specializes in equipment and process technologies for the production of woven plastic packaging. The machine portfolio covers every production step in the bag making process: tape extrusion lines, tape winders, circular looms for weaving of endless tubular tape fabric, coating and lamination lines, flexographic printing machines, and sack conversion lines. In addition, Starlinger also supplies testing and laboratory equipment for quality control, as well as recycling machinery for post-consumer and post-industrial plastic waste.

MAJOR MARKETS AND CLIENTS

The company's customers are mainly packaging producers which supply the construction and building materials industry (cement, lime, gypsum, etc) but also the chemical (powders, resin, fertilizer, etc) and food (flour, grains, cereals, dry pet

food, etc) sectors. A growing share of cement producers have started to produce their own packaging in the last years, many of them using Starlinger technology to produce block bottom sacks made of polypropylene tape fabric to provide durable and highly protective packaging for their product (AD*STAR® technology). Woven tape fabric is also used in FIBC production, providing adequate strength and durability.

The main markets are the Central African countries, China, India and the South-East-Asian region, Latin America, as well as the Middle East and the Maghreb countries.

COMPETITIVE MARKET

To keep its customers one step ahead of the competition, Starlinger continuously improves existing technology and develops new technical features that enhance

production efficiency, output and product quality. The aim is to reduce the overall production costs of the sacks and thereby ensure that its customers can produce high-quality sacks at competitive prices.

An important cost factor for producers is raw material. Here, downgauging plays an important role. Less packaging weight means less raw material input: with this fact in mind, Starlinger gears production technology towards less raw material consumption, ensuring at the same time that the required characteristics for the packaging application are achieved. The special properties of polypropylene tape fabric make the produced sacks extremely break- and tear-resistant, despite being very thin and lightweight, and ensure that their content is protected against humidity or other environmental impacts. To give an example: a woven polypropylene sack that holds 50kg of content can weigh as little as

Starlinger goes Hollywood

PRESENTATION OF A GOLDEN FIBC MADE FROM PET BOTTLE FLAKES AT THE 34TH FIBCA CONFERENCE IN CALIFORNIA

The Flexible Intermediate Bulk Container Association (FIBCA) hosted its 34th conference in California, USA, from 11–13 October 2017. Among the attendees was Austria-based manufacturer Starlinger & Co. GmbH, which specializes in machinery and process technology for woven plastic packaging production and PET recycling and refinement. Jointly with its US headquarters American Starlinger-Sahm, Starlinger presented a golden FIBC made from 100 % PET bottle flakes.

More than 100 participants from over 25 countries attended the 34th semi-annual conference of FIBCA in Hollywood. Starlinger seized this opportunity to present a golden FIBC made from 100% rPET bottle flakes during the event; the company's "bottle-to-bag" technology had already been introduced with great success at Interpack in Europe early in 2017. Building on its vast expertise in the area of PET recycling and refinement, Starlinger spent years developing and refining the process technology for the production of fabric from PET flakes. Initial trials were performed with virgin material; the next step involved the use of recycled PET (rPET pellets). After successful trials, Starlinger moved on to produce tapes, and consequently fabric, from PET bottle flakes. The fabric used for the golden FIBC (the golden colour results from the use of beer bottles) is manufactured on a tape extrusion line type starEX 1600 PF with twinTAPE precision cross winders and circular weaving looms type FX.

The use of PET has many advantages.

Heavy-duty fabrics benefit from the extreme resistance and shape stability of PET (the material maintains its modulus and strength at temperatures up to 80°C/176°F and has excellent creep resistance). But bags made from PET are not only durable, they are also

businesses and governments in their transition to a circular economy. Starlinger aims to contribute to these efforts: by the end of 2018, rPET fabric will be commercially available on the market in Europe and America.

ABOUT STARLINGER & CO. GES.M.B.H.:

Starlinger is a Vienna-based engineering company with production sites in Weissenbach and St. Martin, Austria, as well as in Taicang, China. As a renowned supplier of machinery and complete lines for woven plastic bag production, recycling and PET extrusion and refinement, Starlinger & Co. Ges.m.b.H. is a synonym for quality and advanced technology in over 130 countries. Founded in 1835, the family-owned business has been exporting machines worldwide for over 45 years with an export quota of over 99.5%. Branches in Brazil, China, India, Indonesia, Russia, South Africa, USA and Uzbekistan ensure quick and professional technical

support and service.

ABOUT AMERICAN STARLINGER-SAHM, INC.:

American Starlinger-Sahm, Inc. is the US headquarters of Starlinger & Co. GmbH and handles sales/service activities and spare parts supply for Starlinger and the winder specialist Georg Sahn GmbH & Co. KG in the US and Canada. In 2015, Starlinger invested in a new facility for American Starlinger-Sahm in Fountain Inn, South Carolina, to support the woven packaging production equipment, plastic recycling machines, refining equipment and winding technology. Starlinger is positioned to lead and support the future technology for recycled PET flake in the United States, Canada, and the world.



Starlinger presents a golden FIBC made from PET (beer) bottle flakes: Michelle Diaz-Kotti (American Starlinger-Sahm), Lewis Anderson (FIBCA), Reinhard Lechner (Starlinger) (photo: ©Starlinger).

recyclable: after their use, PET bags may be recycled and re-used in packaging production. "The use of PET in bag production is no substitution for PP, but it will open new markets to our customers due to the environmentally friendly nature and low carbon footprint of bags produced with our technology," says Reinhard Lechner, Product Manager PET Applications at Starlinger. "Especially brand owners and blue chip companies recognize the need to include recycled material in their packaging." This trend is clearly visible in the United States. In 2015, the collection rate of PET bottles was at 31.1% (US National Postconsumer Plastic Bottle Recycling Report); organizations such as the Ellen MacArthur Foundation support

Starlinger's AD*STAR® *carry sack is equipped with folded handles on the sack top, which makes it easy to carry products like cement, ready-mix concrete or fertilizer.



65g itself, while a two-layer paper bag weighs 120–140g.

Starlinger also develops new packaging products made of woven tape fabric in order to open new markets for its customers. The AD*STAR® block bottom valve sack, for example, was developed in the mid-1990s and is now used worldwide as a packaging solution for cement, chemicals, fertilizers, flour, rice, and other dry bulk products. More than seven billion sacks per year are currently produced on Starlinger machinery alone, with an annual increase in production capacity of one billion.

RECENT CONTRACTS FOR STARLINGER PRODUCTS

- ❖ **Salalah Mills Co., Oman:** machinery for producing hot-air-welded AD*STAR® block bottom valve bags and sewn woven bags made from polypropylene tape fabric for the Omani flour producer Salalah Mills. The scope of delivery comprises the entire machinery range for woven plastic packaging production: a tape extrusion line, winders, circular looms as well as lamination and conversion lines. The machinery was installed end of 2016/beginning of 2017; production commenced early in 2017.
- ❖ **Dangote Packaging Materials Plc, Ethiopia:** delivery of production machinery for hot-air-welded AD*STAR® block bottom valve bags and sewn woven bags made from polypropy-

lene tape fabric. In addition to the ad*starKON conversion lines, the scope of delivery comprises a tape extrusion line, winders, circular looms, lines for coating and printing, as well as a recycling machine for woven bag production waste. The equipment will be installed in autumn of 2017 and take up production by the end of the year. With the new equipment installed in Ethiopia, Africa's leading cement producer will no longer need to import sacks from neighbouring countries. Estimated production capacity will start at 60 million sacks/year and later increase to 120 million.

RECENT TECHNOLOGICAL DEVELOPMENTS

High-speed conversion line for block bottom valve sacks ad*starKON HX

The functions of the conversion line for AD*STAR® block bottom valve sacks with patented hot air sealing technology have been extended with a handle punching unit and a new microperforation unit. With 30% higher needle density, the new-generation microSTAR+ microperforation unit ensures that the bag is aerated efficiently while avoiding product emission and minimizing the loss of fabric strength.

The new handle punch unit allows the production of block bottom shopping bags with punched handles, offering another alternative product to suppliers of AD*STAR sacks.

Starlinger's ad*starKON HX conversion

lines are designed for the economic production of standard, open mouth, 2-ply, pocket valve, AD*STAR® carry and BOPP laminated block bottom sacks and achieve highest production efficiency and machine reliability.

Circular loom for tape fabric FX 10.0

The first ten-shuttle loom of its kind, the FX 10.0 is designed to produce heavy-duty fabric out of PP and HDPE fabric for demanding packaging applications such as FIBCs. The innovative reed design and enhanced key components ensure highest fabric quality and production efficiency. The loom operates at a production speed of up to 850 picks/minute and produces tape fabric in the weight range of 55 to 260g/m². The oil-free reed and shuttle design allows the production of fabric for food packaging applications.

Block bottom valve sack with handles: AD*STAR® *carry:

Starlinger's AD*STAR® *carry sack is equipped with folded handles on the sack top, which makes it easy to carry products like cement, ready-mix concrete or fertilizer. Made of polypropylene tape fabric and designed in the typical AD*STAR block bottom shape, the sack is equipped with a pair of punched handles on the bag top that lie flat but open easily to provide a comfortable grip for easy carrying. The patented AD*STAR *carry sacks hold filling quantities from 10 up to 50kg and can be

*Starlinger has worked with STATEC BINDER to develop the IC*STAR process, by which the bottom — and, if desired, also the top — of the sack is welded with a sealing band, instead of sewn, saving considerably on material costs.*



used for packaging a wide range of dry bulk goods destined for wholesale and retail sale, e.g. construction materials, chemicals, or animal feed.

IC*STAR welded sacks

As an alternative to sewn woven polypropylene sacks, which have certain disadvantages in production and usage due to the stitched seams, Starlinger together with STATEC BINDER developed the technology for producing sacks where the bottom and, if desired, top of the sack is welded with a sealing band instead of sewn. Compared to sewing, the IC*STAR process offers considerable material savings in sack production, consequently requiring less raw material. This type of closure also makes IC*STAR sacks completely tight — an important advantage especially for packaging fine powdered goods which tend to sift through stitch holes. The oil-free production process makes IC*STAR sacks ideal for packaging foodstuffs.

PET tape fabric for FIBCs and other heavy-duty applications

With Starlinger's new PET tape production technology, high-performance fabric for heavy-duty applications can be produced. The PET tapes for the fabric are made of either virgin material or up to 100% recycled PET. PET tapes stand out for their high tenacity and high creep resistance (resistance to deformation under mechanical stresses), as well as low residual shrinkage. Fabric and articles that are produced out of it have exceptional high strength and long-term form stability. Due

to the special material properties, PET tape fabric is especially suited for heavy duty applications such as container bags, geotextiles or carpet backing. It can replace expensive cardboard octabins or containers, and due to its temperature resistance it can be used as packaging for hot fill applications. After discharge, the

technology in over 130 countries.

Branches in Brazil, China, India, Indonesia, Russia, South Africa, USA and Uzbekistan underline Starlinger's emphasis on customer-oriented service and support.

AD*STAR® is a registered trademark. AD*STAR® sacks are produced exclusively on Starlinger machinery.

products can be recycled for reuse of the regranulate in the production process.

ABOUT STARLINGER

Starlinger & Co. GmbH, a Viennese family business with production sites in Weissenbach and St. Martin, Austria, and Taicang, China, is in the mechanical engineering industry since 1835 and has been exporting products worldwide for over 45 years. Being the world market leader in the field of machinery and complete lines for woven plastic bag production and PET recycling and refinement, Starlinger has an export quota of more than 98% and renowned for its quality and

Starlinger's PET tapes are made of either virgin material or up to 100% recycled PET.



Continuous rotating high-speed bagging carousel

OPTIMIZED SOLUTION FOR BAGGING OF FLOUR AND POWDERED PRODUCTS

Powdered products are difficult to handle – unless you decide to do it with the new CIRCUPAC: the fully automatic STATEC BINDER-bagging carousel achieves rates of up to 1,200 bags per hour. It offers:

- ❖ fully automatic bag placing, filling, positioning and closing;
- ❖ continuous rotating carousel;
- ❖ permanent compression of the product;
- ❖ extended filling time due to six filling spouts; and
- ❖ rates of up to 1,200 bags per hour.

Six filling spouts that extend the filling time, permanent compression of the product through specially designed vibrating plates and a continuous rotating carousel are the result of a unique system. All movements are controlled by one

designed singling out-grid simplifies the handling with soft bags. Once the bag magazine is empty, it turns and a second magazine goes into operation. Meanwhile the empty one can be refilled during operation.

ACCURATE BAG TRANSPORT AND POSITIONING

The bag is moved from the delivery table to the filling clamp. During this process, a film thickness measurement recognizes if two or more bags stick together and rejects them if required. Then the bag is opened by vacuum suckers and fixed on the filling spout. A pneumatic control system checks if the bag is placed correctly.

DUST-TIGHT FILLING SPOUTS AND CONTINUOUS ROTATING CAROUSEL

The bag is filled with the product while it moves to the next station. Six dust-tight filling spouts can be installed in the carousel which is

baking mixtures: all kind of powdery products can be filled with the CIRCUPAC.

ABOUT STATEC BINDER

STATEC BINDER is an internationally known specialist for customized packaging systems. The Austrian company has already successfully installed more than 1,200 machines worldwide. Whether it's plastic pellets, rice, sugar, grain, fertilizer or flour — the extensive product range offers customized solutions of the highest quality.



intelligent master servo drive-controller. The CIRCUPAC is designed for prefabricated open-mouth bags with a filling weight of 10 to 50kg.

BAGGING PROCESS

The whole bagging system is divided into individual working steps. Each step is controlled accurately before the next one is implemented — the result is an innovative process of the highest reliability and with maximum performance.

DOUBLE SCREW DOSING SYSTEM

The product is dosed by a high-performance double screw dosing system. The screws are motor driven with a frequency converter. For highest precision, a large screw does the coarse feed and a small one does the fine feed into the weigh hopper. After weighing the weigh hopper opens and the product flows through a discharge chute into the bag which is placed on the filling spout.

SPECIALLY DESIGNED BAG MAGAZINE

Vacuum suction cups pick up the bags one by one from the magazine and transport them to the delivery table. A specially

continuously turning. All movements are driven by one intelligent master servo drive-controller. If the capacity should be adjusted only one parameter has to be changed. This innovative system promises easy operation and maintenance. In order to get a compact filled bag specially designed vibrating plates compress the product constantly. Dust extraction is ensured through an internal piping system.

BAG REMOVAL AND CLOSING

At the end of the bagging process the filled bag is gripped by two gripper arms and positioned on the transport conveyor behind. From there the bag is transported into the bag closing unit. A fully automatic labelling unit can be supplemented.

RELIABLE CONCEPT

The CIRCUPAC is distinguished by a sturdy and compact design and a fully enclosed housing. Safety switches that are fixed on the doors guarantee that the machine stops when one of it is opened. The machine is CE-certified, has an ATEX-execution and all contact parts are in stainless steel. So whether it is wheat flour, rye flour, corn flour, pet or animal food, milk powder or



The bagging systems are designed for PE-, woven PP- and paper bags with a filling weight of 5 to 50kg. Big Bag-stations fill up to 150 Big Bags per hour and the palletizing systems are able to stack all types of bags and boxes. With 40 years of experience STATEC BINDER manufactures high-performance open-mouth bagging systems and is known for absolute reliability, innovation and precision.



Mondi: industrial paper bags and filling equipment to meet the market's needs

Mondi Group offers over 100 products customized into more than 100,000 solutions. Leading brands around the world rely on its innovative technologies and products across a variety of industries such as agriculture; automotive; building and construction; chemicals and dangerous goods; food and beverages; graphic and photographic; home and personal care; medical and pharmaceutical; office and professional printing; packaging and paper converting; pet care; retail and e-commerce; and shipping and transport.

Mondi Industrial Bags, a business segment of Mondi Group, is a renowned international producer of industrial paper bags, selling around five billion bags per year. Thanks to its broad range of bag specifications, Mondi Industrial Bags serves major industries including cement and building materials, chemicals, food, feed and seed. The business segment operates a dense sales and services network, the specialized filling equipment department Natro Tech, as well as its Bag Application Centre, where researchers develop and test innovative packaging solutions.

NATRO TECH INDUSTRIAL BAG FILLING EQUIPMENT

Natro Tech S.r.l. offers 90 years of experience in manufacturing industrial bag filling machinery.

Through the integration of industrial bags production and filling equipment customers can benefit from optimized solutions:

Natro Tech S.r.l. provides a thorough knowledge of customers' filling processes of powdery goods. This knowledge in combination with first-class materials and technologies as well as highly educated and committed staff enable them to design filling solutions most suitable for fillers

Bags are produced by experts in filling equipment, and filling equipment is produced by experts in bags.

throughout the world.

The company provides various types of filling and packaging equipment for valve bags, open mouth bags, and big bags. The equipment works for use not only with Mondi bags, but also with those from other manufacturers.

MONDI INDUSTRIAL BAGS

Mondi offers a wide range of bagging solutions, including:

- ❖ **pasted open mouth bags:** open mouth bags are made of high quality materials, closed on one side by sewing or glueing, offering reliable hygienic closure techniques.
- ❖ **pasted valve bags:** pasted valve bags are closed bags made of high quality materials, designed for high-speed filling through a valve on spout packers.
- ❖ **pinch bottom bags:** pinch bottom bags are best suited for medium and large content, available with/without gusset and a variety of barrier and closing options.
- ❖ **SOS (block bottom) bags:** self-standing open mouth bags available in a

multitude of combinations of materials, features and closing methods.

Moreover, among Mondi Industrial Bags' innovations are:

- ❖ **HYBRID PRO:** pasted valve bag with a water-repellent outer ply for high-speed filling of moisture sensitive goods.
- ❖ **SPLASHBAG:** pasted valve bag with a water-repellent surface of the outer ply to keep high tensile strength in a wet environment.
- ❖ **Hot Lock Bag®:** open mouth bag with hot melt coating for sift-proof pinch closure, ideal for packaging goods under strict hygiene standards.
- ❖ **ONE Bag:** pasted valve bag made of one ply of high-performance paper for high speed filling of powdered goods.
- ❖ **PE-Inliner Bags:** open mouth bag, equipped with a PE-inliner as a moisture barrier for hygienic packaging.
- ❖ **woven polypropylene bag:** open mouth





TEST FOR SUCCESS

Mondi has its own **Bag Application Centre (BAC)**, located in Frantschach, Austria, where it carries out tests on its bags to assure best quality.

The BAC conducts full-scale tests of bag filling and handling and evaluates bag performance under the expected environmental conditions. By testing before delivery, it can help its customers create the best possible solutions to meet their needs.

At the BAC, Mondi's application engineering team analyses the bags' strength, de-aeration properties as well as behaviour during filling and different storage conditions.

woven polypropylene bag with easy opening and closing options for packing pet food and feed.

- ❖ **Airstream® family:** pasted valve bags with a unique de-aeration system for high-speed filling of moisture-sensitive powders and building materials.
- ❖ **Effusion Bag:** pasted valve bag with funnel formed effusion opening for precise dosing, optimal protection and reclosing.
- ❖ **Mini Bag:** a compact pasted valve bag for shelf-sized packaging; a great solution for small needs!
- ❖ **Terra Bag®:** Mondi's biodegradable pasted valve bag, OK Compost certified; for sustainable waste management of industrial bags.
- ❖ **Window Bag:** pasted valve or open mouth bag with a transparent window to make the bag's content visible.
- ❖ **World Bag:** pasted valve bag with a unique flap construction for additional printing space.
- ❖ **Refuse Bag (waste management):** open mouth bags for waste management. Performing even in moist and wet environments. Fully compostable and biodegradable.
- ❖ **Protector Bags:** multi-layer paper based bags, suitable for packaging bulky goods/ heavy duty. Flexible, cost efficient, ecological.
- ❖ **Easy Seal — feature:** reliable, fast and strong valve sealing based on a new thermo-media technology. OK Compost certified.
- ❖ **Easy Open — feature:** fast, safe and clean opening for any type of bag through an integrated tear open strip at the bottom of the bag.

Mondi Industrial Bags filling equipment company, Natro Tech, specializes in manufacturing filling equipment such as:

- ❖ **air packers:** developed to fill granular or powdery products at high speed into valve bags.
- ❖ **impeller packers:** developed for filling very fine powdery products (<3mm) at high speed into valve bags.
- ❖ **bag applicators:** bags can be placed onto the filling spout conveniently through an automatic bag applicator.
- ❖ **sealing systems:** offering in-line sealing systems and on-board sealing systems
- ❖ **weighing systems:** various types of weighing systems for optimized productivity, providing various types of statistics.
- ❖ **palletizers (high, medium and low capacity):** they provide automatic means for stacking products onto a standardized pallet for optimal usage of transport and storage room.

KEEPING CURRENT IN A COMPETITIVE MARKET

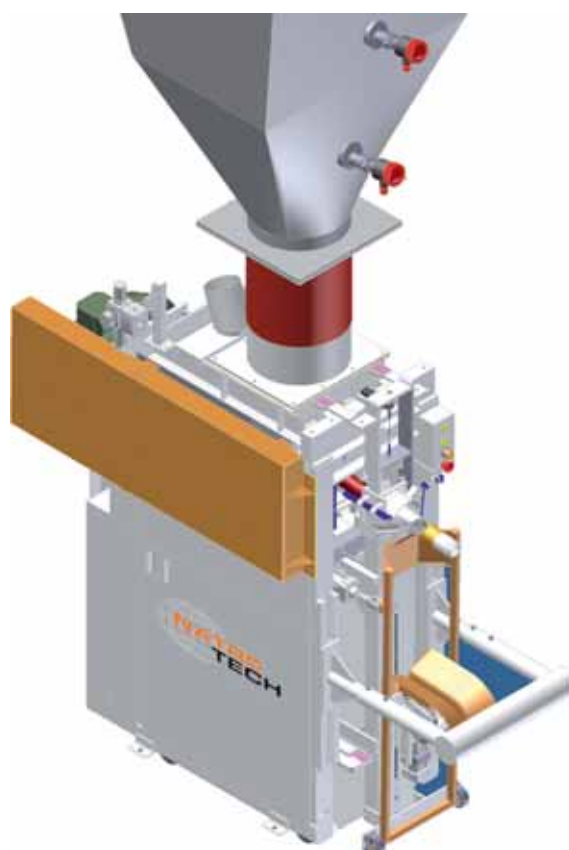
Mondi continuously strives to remain at the top of its game in terms of research and development, to ensure that its products are of the highest quality. It also works closely with its customers, to find solutions that perfectly meet their needs.

To test the bag constructions, Mondi performs simulations of specific situations using state-of-the-art technology.

BAC is a certified independent laboratory for testing UN bags, for dangerous goods.

- ❖ air permeability test;
- ❖ filling behaviour test;
- ❖ determining the force exerted by filling goods;
- ❖ strength test;
- ❖ climate simulation; and
- ❖ resistance to moisture test.

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