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FEATURES

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■ Baltic Focus

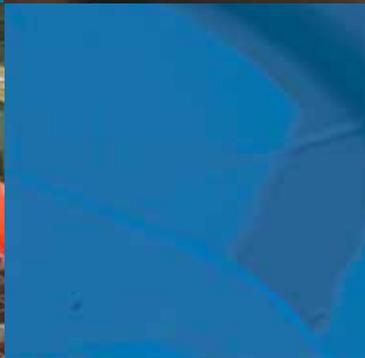
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Coal trade weakness becomes more visible

Negative influences affecting commodity imports into a number of countries have become much more prominent during recent months. Although signs of additional volumes elsewhere are still visible, the result is sluggish overall dry bulk trade growth this year. Clear signs of a pick-up in 2016 are still awaited.

Support from the economic output trend is modest. In its latest (early October) update, the IMF retained the previous 6.8% forecast of China's GDP growth in 2015 as a whole, a half percentage point reduction from last year's increase. But the estimate for world GDP growth was again revised downwards, to 3.1%, below last year's result, amid poor performances in many countries during the past months.

COAL

Global coal trade is proving much weaker than generally expected this year. The steep downturn in China's imports, a major component of international movements, has been especially notable, as shown in table 1. A sizeable reduction in overall coal import demand around the world now seems likely during 2015.

Recent forecasts by the Australian Government Dept of Industry, Innovation and Science indicated that world steam coal trade (including land movements but mostly seaborne) could be down by over 8% this year, compared with the previous twelve months, at 1,030mt (million tonnes). The smaller coking coal trade category may be 1% lower, at 306mt. In both categories reduced imports into China is the main negative element, estimated to be down by 29% overall to 206mt.

IRON ORE

The subdued trend of steel production in raw materials importing countries recently has contributed to slackening iron ore import demand in some areas. During the first nine months of this year, none of the principal steel producers determining global iron ore trade saw any growth in output. Reductions were experienced everywhere.

Based on percentage declines in crude steel production in January-September 2015, compared with last year's same

period, Japan saw the weakest performance with a 5% reduction to 78.8mt. This was followed by South Korea's 3% decline to 51.9mt and China's 2% decrease to 608.9mt (although China's figures are often revised upwards when more complete information is available). In the European Union, output edged down by less than 1%, to 127.5mt.

GRAIN

Lower imports into the Middle East area is the principal reason for the slight reduction in global grain trade envisaged during the crop year ending mid-2016. Many key grain importing countries in the northern hemisphere had good or better domestic harvests in the past summer, moderating foreign buying. Europe was the main exception.

Middle East imports of wheat and coarse grains are expected to be sharply lower in 2015/16. International Grains Council estimates suggest that a 13% decline to 50mt could occur, mainly due to reductions in Iran and Turkey. Both countries had larger harvests recently. Iran's import volume could be 32% lower at 9.5mt, while Turkey could see a 44% fall to 4.9mt. Higher quantities into Saudi Arabia and Iraq are likely to be only partly offsetting.

MINOR BULKS

Various agricultural and related commodities form part of the minor bulks seaborne trade group, including sugar, oilseed meals, and fertilizers.

This sub-group appears to have totalled over 350mt in 2014. In the current year there are signs of some growth evolving. Higher import demand in a number of countries is benefiting oilseed meals movements, while among fertilizer trades positive influences are evident.

BULK CARRIER FLEET

Slowing bulk carrier fleet growth this year is particularly noticeable in the Capesize (100,000dwt upwards) segment. A strong upturn in demolition sales has already occurred and, in 2015 as whole, scrapping is likely to offset a large amount of the newbuildings delivered (table 2). Consequently, Capesize fleet expansion may be down to a marginal 1%.

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

	2010	2011	2012	2013	2014	2015*
Japan	107.9	106.6	113.7	114.5	114.2	115.0
South Korea	95.2	103.2	98.9	100.1	100.8	103.0
Taiwan	53.2	56.0	55.2	57.1	57.0	57.0
China	119.0	138.4	181.5	192.0	165.5	115.0
India	74.5	92.7	123.4	144.1	173.5	185.0
Total of above	449.8	496.9	572.7	607.8	611.0	575.0

source: various & BSA estimates

*BSA forecast

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

	2010	2011	2012	2013	2014	2015*
Newbuilding deliveries	38.6	45.6	41.9	22.0	18.5	19.0
Scrapping (sales)	2.7	10.5	11.7	7.9	4.2	16.0
Losses	0.2	0.0	0.0	0.2	0.0	0.0
Plus/minus adjustments	4.1	4.7	-0.1	0.0	0.0	0.0
Fleet at end of year	210.1	249.9	280.0	293.9	308.2	311.2
% change from previous year-end	+23.0	+19.0	+12.0	+5.0	+4.9	+1.0

source: Clarksons (historical data) & BSA 2015 forecasts

*BSA forecast

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Over-confidence in Chinese growth comes back to haunt investors

China conducts itself in a way as to remain inscrutable to the rest of the world. Data relating to the country's economy released by official agencies remain suspect as many of the pronouncements by Chinese leaders. Many companies in the Western world in particular are now paying the price for believing that China's sizzling growth is never to end. A series of earnings collapse suffered by the world's major mining companies



last year and in the first half of 2015 has once again reopened the debate as to whether many of them would have done better by not acquiring assets paying what now look fancy prices at the high point of commodity cycle preceding the financial crisis of 2008. Had they not further compounded their miseries by committing billions of dollars in capital and exploration expenditure for rapid capacity expansion? More than anything else, the never previously experienced Chinese demand growth for all metals and minerals that lasted for nearly two decades was the reason for the 'insanely' high prices that companies of the stature of Rio Tinto and Anglo American paid to broaden their assets portfolios.

Some Indian groups too made premium priced deals at the last cyclical peak. Like in January 2007 Tata Steel would engage in an eight-hour bidding fight with Brazilian Siderurgica Nacional to acquire Corus for about \$8 billion. The acquisition in one shot made Tata Steel the world's fifth-biggest steelmaker, but there is no ending of pains for it in running steel business in Europe in the present environment.

Ian McVeigh of Jupiter Asset Management of the UK has coined the expression "top stinkers" for the "deals in the mining sector we believe should never have happened." Top stinkers, according to McVeigh, make a long list. But the worst offender to date remains Rio Tinto, which in November 2007 throwing all caution to the wind engaged in a bidding contest with Alcoa of the US and Vale of Brazil for Canadian aluminium maker Alcan. Rio won the Alcan trophy in what till now is the biggest deal in the history of metals by paying \$38.1 billion.

Earlier in June 2006 Lakshmi Mittal paid \$33.84 billion for Arcelor. The price in this case too was high. Acquisition cost rocketed as Mittal had to put up with Arcelor management's bare-knuckled defence strategy and Severstal of Russia, which appeared as white knight. But he stuck to the target as in Arcelor he saw a technology treasure trove as also a route to global leadership in tonnage. Post Arcelor buy, he could, therefore, move into pole position of fending off substitution threat from aluminium and composites, particularly in automobiles. Even then, Mittal is not spared the pain of servicing mountain of debts still at well over the targeted \$15 billion and write down.

Misreading of China and warning bells about the country falling till recently on deaf ears of mining groups — read their CEOs' statements till a year ago defending their massive capital investments to principally meeting future Chinese demand — have left them with such large capacity that they are now doomed to selling their production at continuously falling prices. The company that got it all wrong about China was former CEO

of Rio Tinto Tom Albanese who in the belief that China would need to import growing quantities of aluminium to support its infrastructure development and manufacturing industries didn't think twice in paying a hefty share price premium of 65% to acquire Alcan. Albanese must have believed like many others that for China not rich in bauxite aluminium imports would always be the right choice for it.

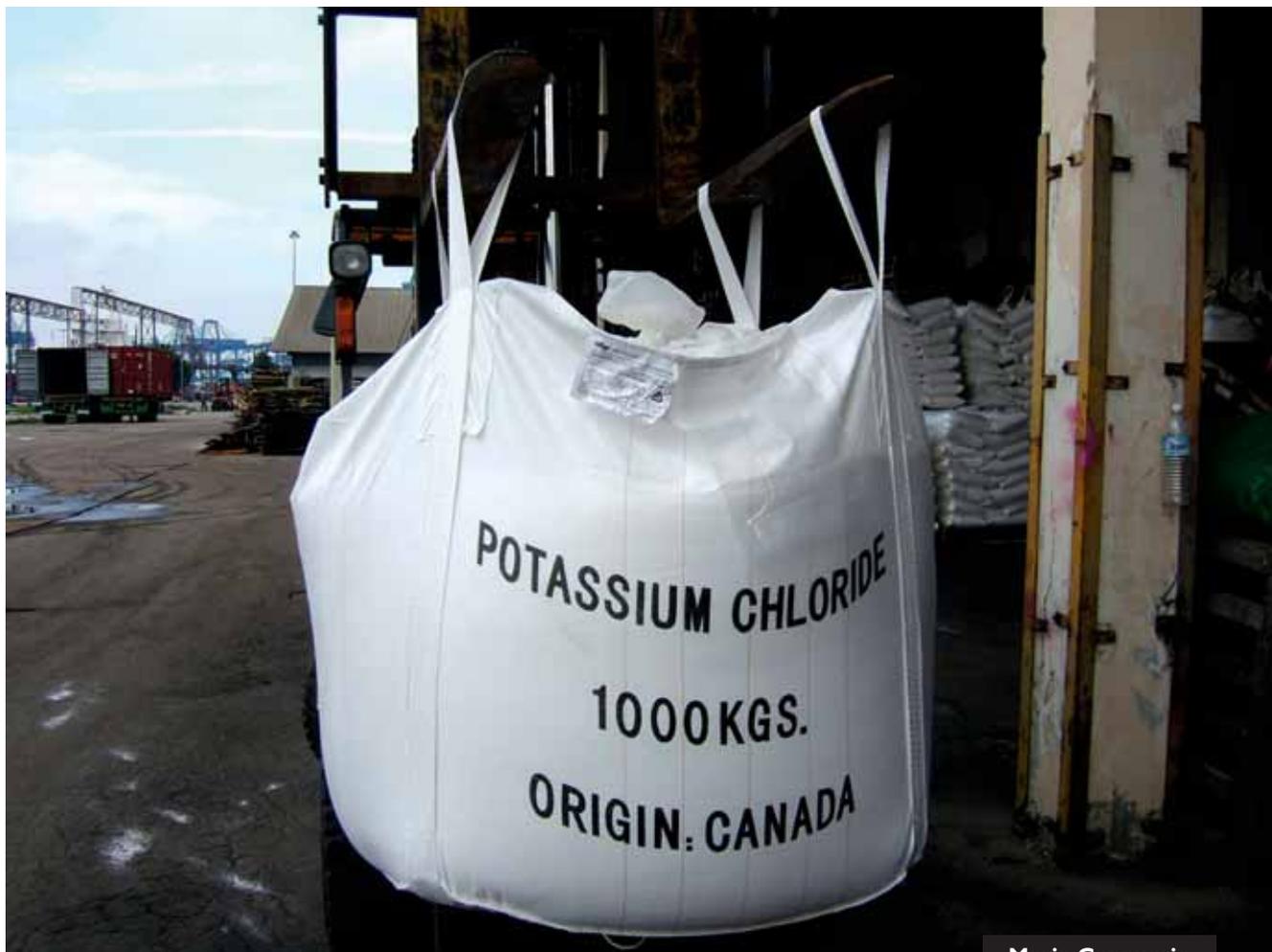
But much to the disappointment of Albanese, China went on rapidly building smelting capacity to become a net exporter of the metal changing the market dynamics of heavily traded aluminium. For the first seven months of 2015 up to July, the country exported a record quantity of 2.87mt (million tonnes) of aluminium. Undaunted by its large scale dependence on bauxite imports, China raised its aluminium production by 14% in 2014 to 28.3mt. In the current year, the country's aluminium production is running at an annualized rate of over 30mt to claim more than half of the world output. What is further causing anxiety to the globally surplus aluminium industry is the 6mt further smelting capacity building in Chinese pipeline. No wonder then Rio's Alcan related write downs have reached \$25 billion. In a cruel repartee, Dick Evans who then in his capacity as Alcan chief lured Rio into the deal described the Anglo-Australian group's acquisition as "one of the worst corporate decisions ever."

Any number of mining groups who enticed by China decided to extract as much minerals as possible out of the ground through takeovers and capacity expansion are now found guilty of large write offs. The lasting slump in commodity prices has forced Anglo American, which in 2008 bought Minas Rio iron ore project in Brazil and then suffered major cost overruns in completing it had also to go for major write down. A recently released study by Boston Consulting Group shows that of 101 mining companies with market values of more than \$3 billion at 2014 end, all but 11 had lost investors' money on a total shareholder return basis. BHP Billiton, Rio and other big miners are out to reassure their shareholders that by progressively reducing capital and exploration expenditure, raising production through stretching productivity and cutting costs all around, they will ride out the slump in commodity prices with minimum possible injuries.

The long commodities slump will leave many assets sick making them ripe for takeover. But will mining groups having already written off billions of dollars angering investors in the process still have the appetite to buy assets going cheap? Value addition prospect triggers the hunt for asset purchases. In the current environment that trigger is missing. Rio Tinto chief executive of copper and coal Jean-Sebastien Jacques has said in a conference presentation "we will not see significant consolidation. This is because there is now greater scrutiny of the real value creation of big bang merger and acquisition and the potential value destructive premium needed to secure tier one assets." What is likely to happen is the emergence of partnerships among miners and trading houses to acquire assets and share the risks.

Kunal Bose

Global fertilizer outlook



Maria Cappuccio

In its latest review of the global economy, the International Monetary Fund (IMF) revealed that prospects had deteriorated since July with growth for 2015 revised down to 3.1%, mainly due to the slow-down in China. Prospects across the main countries and regions remain uneven and while growth in advanced economies is expected to pick-up slightly, activity is projected to slow, mainly reflecting weaker prospects for some large emerging market economies and oil-exporting countries. Declining commodity prices, reduced capital flows to emerging markets, pressure on their currencies and increasing financial market volatility, have increased the downside particularly for emerging and developing economies. The IMF forecast global activity to gather pace in 2016, strengthening in advanced economies and improving in emerging and developing economies, in particular growth, in those countries in economic distress in 2015 (including Brazil, Russia, Middle East and some countries in Latin America) while remaining weak or negative, is projected to be higher next year, to more than offset the expected gradual slowdown in China.

AMPLE GRAIN AND OILSEED HARVEST BOOST SUPPLIES

For the third consecutive year, global grain and oilseed production is expected to produce a bumper 3Bn/t harvest, including a record wheat crop, with slightly lower output for coarse grains, rice and oilseed crops. The large harvest will boost already comfortable stocks and pressure prices across the grains/soybean complex. Since the beginning of the year, wheat prices have fallen by some 20% compared with last year, while a lower corn output is limiting the fall in prices to less than 2%.

BY 2050 AGRICULTURAL OUTPUT WOULD NEED TO RISE BY 60%

This year's theme for World Food Day focused on 'Social Protection and Agriculture: Breaking the Cycle of Rural Poverty'. Speaking at Expo Milano 2015, the UN's FAO Director-General José Graziano da Silva, highlighted the benefits of feeding the world's growing population, and unleashing the productive potential of millions living in rural areas, where nearly 80% of the world's poor are found. He said social protection transfers can

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FERTILIZER PRICES \$ PER TONNE FOB 2009–2015

	2015	2014	2013	2012	2011	2010
	Oct	Oct	Oct	Oct	Oct	Oct
	Wk2	Wk2	Wk2	Wk2	Wk2	Wk2
	\$	\$	\$	\$	\$	\$
Urea						
Baltic	259	310	273	425	490	340
Persian Gulf	—	—	—	460	502	360
Ammonia						
Yuzhny	248	—	410	650	640	415
Tampa CFR	—	650	490	715	650	465
Middle East	—	—	—	705	—	—
Ammonium sulphate						
FSU	—	—	—	220	—	—
Asia	142	—	—	—	—	—
Di-ammonium phosphate						
North Africa	—	—	—	573	677	573
US Gulf	460	464	373	—	635	570
China	—	—	—	—	—	—
Triple Super phosphate						
North Africa	380	—	—	485	565	460 ¹
Muriate of potash						
Baltic	—	—	—	—	—	—
Vancouver	300	310	345	490	590	420

Source: Bloomberg, FarmFutures, Fertilizer Week, Fertilizer Market Bulletin, Profercy/I Monthly average—Sept

provide incomes and food to improve the nutrition of the poor requiring a broader perspective and investment in order to meet the 2030 Agenda and the Sustainable Development Goals agreed by governments. FAO has estimated that agricultural production will need to increase around 60% by 2050 to feed the world.

GLOBAL FERTILIZER USE

1961–2010/20 mt nutrients

Year	Nitrogen	Phosphate	Potash	Total
1961/2	11.6	10.9	8.7	31.2
1970/1	31.8	21.1	16.4	69.3
1980/1	60.8	31.7	24.2	116.7
1990/1	77.6	36.0	24.6	137.8
2000/1	81.2	32.5	21.9	135.6
2001/2	82.9	33.4	23.0	139.3
2002/3	85.1	34.1	24.7	143.9
2003/4	87.1	35.2	25.5	147.8
2004/5	90.2	37.5	25.6	154.7
2005/6	93.2	37.0	26.3	156.5
2006/7	97.4	38.1	26.9	162.4
2007/8	100.5	38.4	28.9	167.9
2008/9	97.7	33.7	23.4	154.8
2009/10	102.2	37.6	23.7	163.5
2010/11	104.1	40.6	27.5	172.3
2011/12	107.9	41.4	28.0	177.2
2012/13	108.1	41.6	29.1	178.8
2013/14	110.4	40.3	30.2	180.9
2014/15e	111.8	41.3	31.5	184.6
2015/16f	112.9	41.8	31.8	186.5
2019/20f	119.2	45.7	35.3	200.2

Source: International Fertilizer Association

WEAK AND CHALLENGING ENVIRONMENT FOR CROP NUTRIENTS

Earlier in the year the International Fertilizer Association's (IFA) slower growth for global fertilizers in 2015/16, with demand expected to expand by 1% year-on-year to 186mt (million tonnes) reflecting global economic uncertainty, currency devaluations in major fertilizer consuming markets and lower crop prices. The IFA forecast phosphate demand to rebound 41.8mt, while potash and nitrogen to rise more moderately to 31.8mt and 112.9mt, with demand to increase in all the regions except Oceania and Latin America. Since then, the Chinese government's unexpected intervention to devalue the yuan in August further pressured fragile currencies in several emerging and developing countries, significantly impacting the demand for crop inputs.

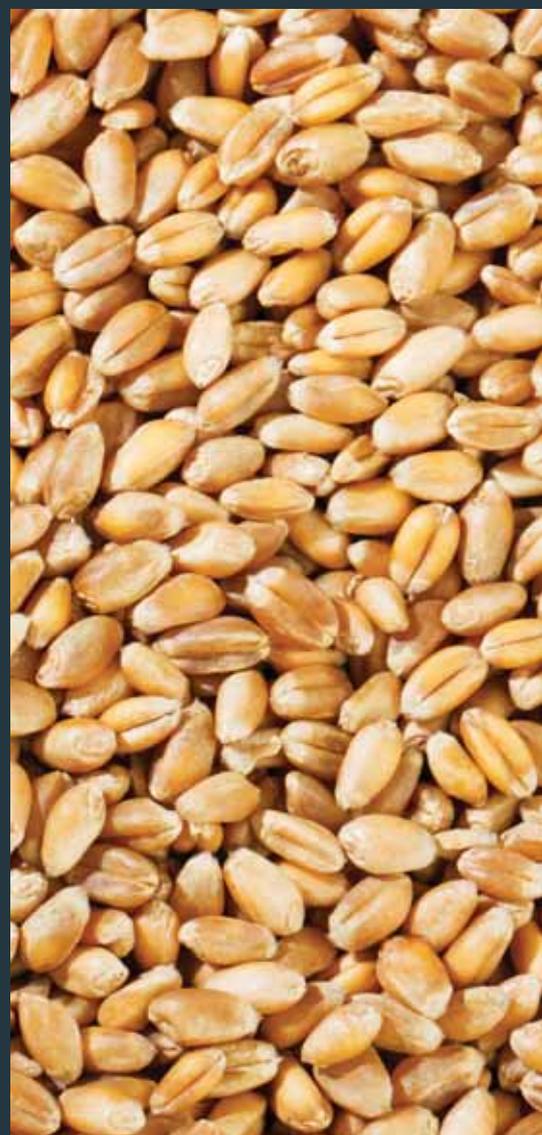
Longer term, the IFA anticipate the prospect of economic uncertainty, industry surplus, policy constraints, abundant stocks and low commodity prices will continue to weigh on global fertilizer demand for the next two to three years, with moderate growth expected to reach 200mt by 2019/20. They forecast the highest growth rates will occur in Africa, particularly Sub-Saharan Africa, where the policy and economic environment in a number of countries is stimulating demand; Latin America, where the cropped area is increasing steadily and in South Asia where phosphate and potash demand is progressively recovering; and potentially West Asia, Eastern Europe & Central Asia, geopolitical tensions permitting; less so in developed countries and in East Asia where China's new policy to cap fertilizer demand at 1%, per annum, for the next five years, expected to stymie demand.

TIGHT FARM PROFIT MARGINS WEAKEN NUTRIENT DEMAND

The slow-down in China's economic growth and the abrupt

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CEREALS AND OILSEEDS – PRODUCTION, USE & STOCKS 2014–2015/16 MT

	Prod 14/15	Prod 15/16	Use 14/15	Use 15/16	Stocks 14/15	Stocks 15/16
Wheat	726	733	707	716	212	229
Coarse grains	1297	1267	1278	1276	231	223
Rice	479	474	485	488	102	88
Total Cereals	2,502	2,474	2,470	2,480	545	540
Oilseeds	538	531	439*	447*	92	96

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

devaluation of the yuan, pushed up the cost of imported (dollar denominated) crop nutrients. Falling nutrient prices reflect weak global demand, tight margins, declining purchasing power among farmers and depreciating currencies of emerging economies. While the build-up of surplus nutrient supplies is exacerbated by falling costs, cheaper feedstock prices (natural gas, coal) and declining producer currencies.

Global farm economics still support fertilizer demand, despite weaker crop prices, said Yara's CEO Svein Tore Holsether highlighting improvements in Brazil, a market which has tripped up many agrichemical groups. The Norway-based group, the world's largest nitrogen fertilizer producer, said that crop prices, are below last year's levels in dollar terms but still supportive for fertilizer use, while farm margins for fertilizer application, remain supportive overall.

Like fertilizers, agrichemicals are also struggling with weak demand and falling profits. With the industry poised for a shake-up, Dow Chemicals boss Andrew Liveris said, "Everyone is talking to everyone," before announcing the company's forward plan of 'targeted actions' with an intense focus on delivering earnings growth and increasing shareholder return. Changes in key personnel have already taken place in leading companies, Syngenta's CEO Mike Mack resigned and Daniel Leever CEO of Platform Specialty Products, retired days after a second profits warning, while at DuPont a new CEO has been installed.

NUTRIENT PRICES DRIFT LOWER

Fertilizer prices continue to show little strength as the fall application season advances; urea prices led the decline (down

for the fifth straight quarter) while phosphate and potash prices were lower. Phosphate prices firmed at the end of October, but likely to be affected by poor demand as key importers like Brazil and India cut-back on purchases. DAP was steady at \$423.50 at the Gulf (Oct 25); swaps are weaker through winter, which could reduce prices by \$30 or more. Farmers so far appear slow to make purchases. Potash prices were steady, lower prices possibly encouraging some demand, as producers cut production, to manage supplies. Macquarie Bank forecast lower potash values likely to average \$240/t in the Vancouver export market by the April-to-June quarter next year, down from over \$300/t in the August-September quarter 2015, citing a continued situation of oversupply.

In Brazil and China, two important countries for fertilizer demand, GDP growth is forecast to be well below the previous three-year average. Many currencies have also depreciated significantly against the US dollar. The Brazilian real has been the worst performing currency this last year, making fertilizer imports, less affordable, but boosting local crop prices and providing positive crop margins. Brazilian buyers are said to be holding out on significant purchases, based on high-beginning stock levels and a subdued agricultural outlook-Brazil's fertilizer imports expected to decline by as much as 15–20 % year-on-year.

GLOBAL WHEAT PLANTINGS TO BE SLIGHTLY LOWER IN 2016

Planting of winter wheat for the harvest in 2016 is well advanced. The global wheat area is expected to be slightly lower, but above the average of the last five years. Overall conditions

CEREAL EXPORT PRICES US \$ FOB PER TONNE 2008–2013

	2015 Oct Wk2 \$	2014 Oct Wk2 \$	2013 Oct Wk2 \$	2012 Oct Wk2 \$	2011 Oct Wk2 \$
Wheat No 2 HRW	221	289	327	368	294
Corn No 3 Yellow (Gulf)	175	184	211	316	279
Sorghum (Nola)	198	229	233	311	262
Soybean No 2 (Gulf)	369	410	515	581	488
Argentina (up river)					
Wheat	223*	248*	—	300*	—
Corn	161*	166*	—	294*	—
Soybean	360	414	527	584	491
Thailand					
Rice White 100% 2nd grade (Bangkok)	375	435	—	618*	616
Rice Broken A1 super (Bangkok)	316*	336*	—	497*	—

Source: FAO IGC USDA – *Monthly avge – Sept;

Rice pxs based on indicative quotes

are favourable for winter wheat plantings. Rains are moving through the US southern Plains into the Midwest, with the central and northern Plains also seeing light moisture. Poland, Ukraine and Southern Russia have experienced dry conditions—the arrival of late rains unlikely to help crop establishment as cold temperatures have come early, pushing wheat into dormancy. By contrast too much rain in Hungary has hampered plantings.

RECORD BRAZILIAN SOY CROP IN PROSPECT

Despite lower international soybean prices, compared to last year, Marcelo Guimarães deputy director of economics at Brazil's agriculture ministry flagged a potential rise in domestic soybean sowings of some 2.2–2.5%, implying a further increase to the official planted area of 32.6M/ha, with the outlook for crop establishment improving through October, despite some concerns over dryness in major central producing areas including Mato Grosso, and the potential threat to southern Brazilian producing states from excessive rains, bolstered by the presence of *El Niño*.

FARMERS CUT BACK ON NUTRIENTS TO PROTECT PROFITS

Farmers are encouraged, to plant soybeans, by a weak real (4 reals per US dollar), has protected local prices from the international market. Cushioned by the strong soybean price in reals, increases Brazil's competitive edge on the international market, at the expense of other exporters mainly the US. USDA forecast Brazil's soybean production to grow by nearly 4% to almost 103mt in 2016. Guimarães told the AMIS food outlook conference that soybean prices could fall to \$7–7.50/bu (\$257–\$276/t), and it would “still be profitable for Brazilian farmers” to plant the oilseed. But he cautioned that farmers are cutting-back on expensive imported inputs like seeds, agrichemicals and fertilizers. Brazil's fertilizer sales fell in the Jan-Aug period by 1.3mt to 18.6mt. CBOT Futures Nov soybean contract \$9.06/bu (22 Oct '15-04.14).

ARGENTINE ELECTIONS MAY TRIGGER LARGER CORN OUTPUT

Argentines will go to the polls again on November 22nd. The business friendly mayor of Argentina's capital Mauricio Macri won enough votes on October 25, to trigger the first presidential runoff in the country's history, dealing a startling setback to the populist ruling party. Macri is in favour of scrapping export restrictions on agricultural exports, popular with the farm lobby—a win by him over rival Daniel Scioli may trigger an increase in corn sowings. The current strict export controls on grains, were introduced by the outgoing President Christine Fernandez to shield consumers

from food price inflation, but has also impacted/skewed production, to favour soybeans over corn, due to tighter export controls. According to Dr Cordonnier of Soybean and Corn Advisor “...Argentine farmers now basically grow a monocrop of soybeans year after year.” While farmers recognize this is an unsustainable practice, they say they are being forced to do it because of government policies.

US CORN ACREAGE EXPECTED TO INCREASE IN 2016

The latest forecast from Informa points to almost a 3% increase in US corn acreage to 90.8M/ha, at the expense of soybeans, trimmed to 83.9M/ha. For corn using 168.9bu/acre-trend line average yield, produces a US crop of 358mt and for soybeans using a 46.2 bu/acre average yield, could produce a crop of 106mt in 2016. By comparing the respective Futures market price data for both crops, shows corn's premium to soybeans is \$29/bu, and confirms that of the major row crops, corn currently has the highest implied net revenue return per acre, better than last year, and up slightly on last month, remaining slightly above soybeans.

With the current large US harvest still in progress, and

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pressure on storage, farmers are reluctant to sell crops, preferring to store them on-farm until low local prices, reported to be below the cost of production, improve. Despite the potential for higher inputs, in response to increased corn sowings and depleted soil fertility, following three bumper harvests, farmers are holding-back on buying crop nutrients in the hope of future price falls. The global 2015 corn crop forecast 36mt lower at 973mt supported CBOT Corn Futures Dec '15 \$3.79/bu (11.55 Oct 24 '15) — Corn 3 FOB (free on board) US Gulf \$178/t (22 Oct '15).

CF INDUSTRIES ACQUIRES GROWHOW AND OCI

While currency issues have been a significant hurdle to sales this year, Yara's European nitrate production is benefitting from a weak euro and lower gas prices improving the relative competitiveness of European fertilizer capacity. Based on current forward markets for oil and natural gas, the company's energy costs for fourth quarter 2015 and first quarter 2016 are expected to be respectively 550m krone and 300m krone lower than a year earlier. While CF Industries and Yara held joint discussions, these were subsequently shelved; CF Industries went on to acquire Yara's 50% interest in GrowHow, Britain's largest fertilizer producer, for \$580 M in July; and confirmed in August, a new deal with Dutch firm OCI. The deal is expected to encourage expansion outside North America, plus growth in the domestic market, where OCI is building a nitrogen fertilizer plant in Iowa and a new methanol plant in Texas.

NITRATE FERTILIZER MARKET DRIVEN BY PACE OF CHINESE SUPPLY

Global ammonia capacity is expected to rise by 16% from 2014 to 250mt NH₃ in 2019 — main additions to capacity will be China, Indonesia, Russia, US, Algeria, Egypt and Nigeria; with a small increase in seaborne ammonia rising by 2% to 18.8mt assuming projects are completed. The nitrate fertilizer market will continue to be driven by the pace of Chinese urea supply the benchmark for global nitrogen pricing, given the record volumes exported over the last year. Prices are also expected to remain undermined by Chinese urea exports, the competitiveness of which will be enhanced by falling prices of coal, a major raw material.

The IFA project global nitrogen supply in 2019 at 174mt N with demand for industrial and fertilizer demand to rise by 16mt N to 157mt N. Significant growth is expected in East Asia, South Asia, Latin America with African demand, rising substantially, driven by fertilizer consumption of 4% per annum. Global industrial nitrogen demand is expected to expand by 28% by 2019, compared with a 6% rise in the fertilizer sector potential surpluses accelerating from 10mt N in 2016 to 18mt N in 2019.

GLOBAL NITROGEN SUPPLY/DEMAND 2015–2019 MT N

Fertilizer	2015	2016	2017	2018	2019
Nitrogen capacity	—	—	—	—	205.6
Nitrogen supply*	—	158	169	—	174
Nitrogen demand	145	148	151	154	157
Fertilizer use	113	115	116	118	119
Nitrogen balance	—	10	18	—	18
% of supply	—	—	—	—	10%

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

NEW UREA CAPACITY EMERGING IN EAST ASIA, AFRICA AND NORTH AMERICA

The IFA expect urea capacity, over the next five years, to be driven by industrial use rising from 55% to 72%.

Sixty new units are planned to come on stream by 2019, with 20 units located in China and the remainder located outside China, in countries well-endowed with natural gas reserves. Global urea capacity is expected to increase by 44mt to 252mt — three regions, led by East Asia (35%), Africa (18%) and North America (15%) will account for two-thirds of capacity growth. The IFA forecast global urea supply to grow by 32mt from 2014 to 211mt in 2019. While global demand is forecast to rise to 198.1mt by 2019, significant increase in urea fertilizer demand is seen in South Asia, while industrial urea use is expected to expand in China and Europe.

LARGE SUPPLIES PRESSURE UREA PRICES

Prilled urea prices FOB Black Sea averaged \$268/t through June-Sept, down 16% on the previous year, due to lower production costs, mainly in China. In addition, production capacity has increased, not only in China, with exports expanding from Iran and from new plants in Algeria and Saudi Arabia. While Chinese urea exports at 1.8mt for July/August are below 2.4mt last year, the global market is still negatively affected by exports at 8.5mt (Jan–Sept) up from 6.6mt last year. Production remains restricted for key exporters like Egypt and Ukraine-with buyers unwilling to commit to holding stock, and low crop prices keeping prices soft.

EXCESS POTASH CAPACITY, WEAK DEMAND FORCE SHUT-DOWNS

Falling nutrient prices, reflecting excessive mining capacity and weak demand characterized by just-in-time buying, in key markets has affected several producing companies. Dry weather has limited crop production in India, a weaker yuan following devaluation together with a new Chinese fertilizer tax and weak economy in Brazil, hit sales. Mosaic, reduced output and laid off workers at their Colonsay, Saskatchewan potash mine in Western Canada, in October, as low crop prices continue to erode farmer demand for agricultural products. PotashCorp also lowered its forecasts for world industry potash sales in 2015 in China, India and, in particular, North America, where volumes will come in at 8.5–9mt, below the 9–9.5mt previously expected and brought forward the closure of its Penobscquis mine in the province of New Brunswick, with capacity for 800,000/t plus three-week shutdowns at three other Saskatchewan mines to improve costs and manage inventories. The combination of the shutdowns and the closure of Penobscquis are expected to reduce the October-December production by nearly 500,000/t. PotashCorp, Mosaic and other potash producers have endured a 17% drop in spot potash

GLOBAL UREA SUPPLY/DEMAND 2015–2019 MT UREA PRODUCT

Fertilizer	2015	2016	2017	2018	2019
Urea capacity	216	225	234	243	252.7
Urea supply	—	—	—	—	211.0
Urea demand	171	178	185	191	198.1
Fertilizer use	140	143	147	151	154.6
Urea balance	—	—	—	—	12.9
% of supply	—	—	—	—	6%

Source: IFA-data M/t urea basis

**GLOBAL POTASH SUPPLY/DEMAND
2015-2019 MT K₂O**

Fertilizer	2015	2016	2017	2018	2019
Potash capacity	—	—	—	—	60.8
Potash supply	—	—	—	—	51.8
Potash demand	35	36	37	39	39.5
Fertilizer use	32	33	34	34	35.1
Potash balance	—	—	—	—	12.3
% of supply	—	—	—	—	24%

Source: IFA-Data K₂O/t basis

prices and are bracing for further declines amid a wave of new capacity. Macquarie expects global potash demand to fall by 4.4mt in 2016; with China holding increased stocks of potash it expects the bias of pricing-power, in future negotiations, to shift toward buyers.

Earlier in the year the IFA forecast global potash capacity to expand at a rapid rate, a combination of expansion by established producers and four large Greenfield projects, in Canada, Russia and Belarus over the five year period to 2019. The IFA forecast capacity to rise by 16% 60.8mt K₂O, with the largest increase expected to occur in North America (Canada), the EECA (Russia, Belarus) and East Asia (China); with supply to increase to 51.8mt K₂O, while total demand expected to rise modestly to 39.5mt K₂O by 2019, leaving a potential surplus, depending on the rate of growth, of 11–16.7mt K₂O by 2019.

POTASH PRICES FORECAST TO FALL IN 2016 AND 2017

Global potash demand could fall by 8% in 2016, leading to a record surplus as new low-cost projects come on stream. Citing ongoing weakness in agricultural markets and depreciating currencies in emerging markets, Macquarie cut projected potash spot prices by almost 8% to \$254/t and to \$250/t in 2017. Come next year the bank expects average values at \$240/t in the Vancouver export market by the end of June, and sees the prospects for large-scale projects like BHP Billiton Ltd's \$3.8bn Jansen mine in Canada mothballed, in favour of other less capital-intensive projects in metals and energy, unless prices rise significantly; the bank cut its long-term price forecast by 16% to \$280/t. By contrast, BHP forecast a deficit for potash supply beyond 2020 as existing mines become non-productive and expect to build the Jansen mine in the next ten years either alone or in partnership with others; they remain confident of the attractive long-term market fundamentals for potash, driven by the requirement for higher yields from arable land to feed a growing global population.

PHOSPHORIC ACID CAPACITY TO EXPAND

Phosphate rock supply is expected to grow by 35mt to 255mt in 2019, Morocco, Saudi Arabia, Jordan and China account for eighty% of the increase. Morocco phosphate rock 70% BPL contract fas Casablanca (Sept '15) quoted at \$121/t slightly up on last year. The IFA forecast Phosphoric acid capacity to rise to

**GLOBAL PHOSPHORIC ACID SUPPLY/DEMAND
2015-2019 MT P₂O₅**

Fertilizer	2014	2015	2016	2017	2018
Phosphoric acid capacity	—	—	—	—	62.9
Phosphoric acid supply	47	48	49	50	51.1
Phosphoric acid demand	44	45	46	47	48.3
Fertilizer use	37	38	39	40	41
Phos. acid balance	—	—	—	—	2.8
% of supply	—	—	—	—	5%

Source: IFA-Data P₂O₅ tonnes basis

62.9mt P₂O₅, with over 30 new acid units to come on stream with over 22 units located outside China. Large capacity additions are expected in Morocco, Saudi Arabia, China and Brazil. Global supply is expected to rise to 51.1mt P₂O₅ in 2019, while demand is forecast at 48.34mt P₂O₅. Global capacity for the main processed phosphate fertilizers will grow by 7.1mt P₂O₅ to 50.4mt P₂O₅, China and Morocco will account for 15 of the 30 new units with Saudi Arabia, Brazil and India responsible for the remainder, DAP capacity expected to account for the bulk of the increase.

SLOW PACE OF PRODUCTION REFLECTS LACK-LUSTRE MARKET

Prices for DAP fell 1% due to weak demand especially in Brazil, while TSP prices were flat during the third quarter. India's imports have been robust but maybe negatively impacted by a lower rupee, weaker monsoon season (with rainfall estimated to be 15% lower and expected lack of subsidy funding in place for the current fertilizer year. Phosphate production remains below capacity due to curtailments in Tunisia and South Africa. Mosaic is expected to maintain its current slow phosphate production pace, and cautioned that sales would come in towards the bottom of range it had previously guided to. Since the company announced its third quarter guidance on 4 August, domestic and international crop nutrient markets have softened, resulting in lower than expected sales and weaker prices. The company cited slow purchases from key buyers in Brazil and North America, pressure on global fertilizer markets from weak crop prices, making farmers' less willing to spend and hampered by an appreciating dollar, making US exports less competitive against other origins.

PRICE SUPPORT DEPENDS ON SIZE OF OUTPUT DISCIPLINE

Phosphates moved lower Gulf prices for DAP fell \$1.50 to \$428/t, but swaps are down to \$400 for November and \$381 for January-March; whether prices fall further may depend on whether large-scale producers like Morocco and China cut back production. The global phosphate market remained strong through third quarter with the average US DAP FOB Gulf price down a modest 6% compared to the same quarter last year. Following a substantial increase in Indian import demand this year, the market is currently well-covered, and global DAP pricing has lately come under pressure.

India needs to increase fertilizer use to improve crop productivity

The Indian government's Economic Survey for 2014/15 says there has been improvement in the country's productivity of foodgrains, pulses and some other crops since the beginning of the new millennium. But whatever the progress, the Survey admits, farm yield gaps between India and the best cropwise

available in the world remain wide. This and also major variations in crop productivity among the states in the country underline the "possibilities" of raising volumes of farm production by "increasing the yields of most of the crops," says the Survey.



*Agricultural expert
Om Prakash
Dhanuka.*

Agricultural expert Om Prakash Dhanuka says “farm productivity is decided by several factors like quality of seeds, application of nutrients in right quantity and ideal proportion, plant watering either by rains or by way of irrigation and crop growing practices. The issue here in discussion being fertilizer use, let me say not only is the use of nutrients per unit of arable land is low in India but the ratio of their application is highly skewed in favour of urea.” According to the World Bank, fertilizer use in India per hectare of arable land is 157.5kg. This compares poorly not only with China’s 364.4kg but also with 208.7kg for Bangladesh, still a least developed country.

Farm experts are worried that use of Di-ammonium phosphate (DAP) in India is considerably lower as compared with urea, leading to imbalanced application of nutrients. Indian farmers are prone to use large quantities of urea, which because of government recommended cap on its retail price is found cheaper than decontrolled phosphatic (P) and potassic (K) nutrients such as DAP and muriate of potash (MOP). The highly subsidized urea is sold at Rs5,360 (\$82.42) a tonne in retail market compared with average industry production cost of over Rs20,000 a tonne. Disincentive in use of adequate quantities of P and K is built in the administration of subsidy.

Government subsidy for urea amounts to close to 75% of production cost. Subsidy for P and K, however, covers 25% to 40% of cost of making the two nutrients. No wonder the government’s department of fertilizers says the ratio of N (nitrogen that is urea) PK application has worsened from 4:2:1 in 2009/10 to 8.2:3.2:1 in 2013/14. The deterioration must have

continued since. Referring to this Dhanuka says “arrest in productivity growth of some crops and loss of land fertility in many crop growing centres is to be attributed to the skewed use of NPK. No doubt farmers need to be educated about the ideal proportion of NPK application depending upon crops to be grown. Equally important is promotion of biofertilizer use in all arable tracts. Its application along with NPK ensures that every other nutrient dissolves in properly irrigated land. Though not a day too soon, the government is now thankfully engaged in promoting the cause of biofertilizer.”

He also welcomes removal of cap on neem (*azadirachta indica*) coated urea production which will go a long way in stepping up the availability of the nutrient. India’s chemicals and Fertilizer minister Ananth Kumar says India is presently using around 6mt (million tonnes) coated urea, but this can now be “raised to the full urea demand of 31mt.” Application of neem coated urea on a large scale will improve land fertility.

Dhanuka remains a critic of the methodology of distribution of fertilizer subsidy. As it obtains, the huge difference between maximum retail price (MRP) and production cost of urea is covered by subsidy, which is credited to manufacturers. “In the distribution of urea, there is leakage of fertilizer in the black market. Opening of millions of bank accounts and identity cards in rural India has created the ground for crediting fertilizer subsidy directly to farmers. From the next crop year (July to June) at least, the government should start paying subsidy directly to farmers. This will benefit the farming community as it will ensure effective utilization of subsidy,” says Dhanuka. Subsidy on urea account alone amounts to around Rs800 billion and routinely unpaid subsidy balloons into huge amounts causing distress to manufacturers.

Annual consumption of urea in the country is around 31mt while local production mostly through gas based route is 22mt. The shortfall in local availability is met by imports. Fertilizer Secretary Anuj Kumar Bishnoi says “we are looking at a much higher domestic production. So once we have a much higher domestic production, the gap between demand and domestic availability will reduce and so our dependence on imports will be less.” The government has rolled out a new fertilizer policy designed to maximize urea production at operating plants through improvements in operational efficiency, promoting conversion of high cost coal based units into gas based ones and create a favourable environment for building of new gas-based plants. At the same time, creation of a more efficient urea distribution system that will reach urea and other fertilizers in remotest parts of the country remains a new policy goal.

A report by Fertiliser Association of India says among the factors responsible for restricted domestic production is “availability of gas from indigenous sources remaining significantly lower than the industry’s requirement of 42.4 MMSCMD. The government has imposed a cap of 31.5 MMSCMD on supply of domestic gas to urea plants.” Because of shortfall in domestic supply, a number of recently converted urea units have come to totally depend on imported LNG. In order to ensure that cost of gas remains identical for all units irrespective of source of supply, the government has introduced “pooling of prices of indigenous and imported gas.” The share of imported LNG in total gas use by urea makers is now as high as 36%.

Growing use of imported gas as feedstock for urea plants, near total reliance on foreign origin raw materials for making phosphatic fertilizers and full import dependence for MOP will sustain the country’s thrust to build plants to make fertilizers and their raw materials abroad. As is the practice so far, Indian

investments are in joint ventures with local partners in countries such as Oman, Senegal, Jordan and Morocco with production buyback provision. Easing of sanctions against Iran by the US and other Western powers has led India to make multi-project big investment offers to the Persian Gulf country, including the building of a urea plant at Chabahar port adjacent area. In fact, India will also be engaged in further developing the port.

The urea plant that India proposes to develop in a JV with a local Iranian partner will have urea capacity of 1.3mt costing over \$900m. India's involvement in the project will be on condition of bringing back the entire production. The fate of the project hinges on successful completion of negotiation between the two countries on the price of gas.

According to Indian shipping minister Nitin Gadkari, "Iran is offering gas to India at \$2.95 per million British thermal unit to set up urea plant at the Chabahar port in Iran. India is negotiating the gas price and has demanded it at \$1.5 per mmBtu." Three India government-owned fertilizer companies RCF, GNFC and GSFC are in the process of forming a consortium to take forward project implementation and its first task will be to identify a local partner with capacity to facilitate project execution.

In the meantime, a JV between Indian Farmers Fertiliser Cooperative (IFFCO) and Jordanian Phosphate Mines Company (JPMC) has started production of phosphoric acid at the \$860m plant at Eshidiya, some 325km from capital city Amman. The entire production of phosphoric acid from the newly commissioned plant will be shipped from Jordan's Aqaba port for delivery at Kandla port in Gujarat. According to JPMC chairman Amer al-Majali, "in the case of this project, we shall be converting around 2mt of rock phosphate extracted from



Eshidiya mine into phosphoric acid. This will then be bought by IFFCO for making phosphatic fertilizers in India." India's target being to reduce dependence on imports of fertilizers and their raw materials, the search will be on to strike more and more JVs abroad. "JVs in the nature of 50:50 ownership with partners from host countries will underline security in supply of nutrients at all times," says an industry official.

Being heavily import dependent, India has reasons to be pleased with declining trend in prices of fertilizer raw materials over a year. A report by HDFC Bank says "fall in prices is largely on the back of global capacity addition. According to the International Fertilizer Industry Association, close to 200 expansion projects for fertilizer raw materials at an investment of \$110bn are at advanced stages of development. The projects coming up in Morocco, Saudi Arabia, China, Brazil, Canada and Russia are expected to be operational in the next four-five years."

Kunal Bose

Brazil set to import 20% less fertilizer this year due to currency collapse

The collapse in Brazil's currency is making fertilizer, more than two thirds of which is imported, much more expensive, writes Patrick Knight.

Brazil, which normally imports about 70% of the approximately 30mt (million tonnes) of fertilizer used each year, is on course to buy almost 5mt, or 20%, less of the commodity from abroad this year than during 2014. This is because the Brazilian currency, the real, has fallen by close to 50% against the US dollar in the past year, which has resulted in imports costing farmers close to 60% more than they did a year ago. To compensate for this, the weaker real means farmers are getting much more in local currency for the soya, maize, sugar, cotton, beef and wood pulp they export. So even though the world price of most of these commodities has fallen in recent months, for this year at least, farmers are no worse off and so most have not reduced plantings.

In fact, Brazil is expecting an all-time record crop of soya, a crop which uses 40% of all the fertilizer now used for 2015/16, even though its price has increased sharply. This is both because of the increased cost of fertilizer and diesel fuel, much of which is also imported, and also because many farmers have borrowed large amounts in US dollars, mainly to buy more land, so are also having to pay much more to service their often heavy debts. With the world price of iron ore and other minerals having

fallen sharply in recent years, and because manufactured goods made in Brazil have lost competitiveness, farm sector exports are now responsible for more than half all Brazil's export earnings. Farm exports have become crucial in a country where the output of both services and manufactured goods, has plummeted.

Because imports have fallen, along with the value of the currency, Brazil is on course to have a healthy trade surplus this year, which is almost the only positive economic news. Apart from agriculture, the rest of the economy is in a mess. Inflation is soaring, recession means unemployment is rising, which is resulting in large numbers of Brazilians having great difficulties in keeping pace with servicing their debts. Many are cutting back on consumption, not least of more expensive foods such as beef, dairy products and processed foods.

Because sufficient fertilizer has been applied by farmers in the past few years, yields are not expected to be much lower this year than in 2013 and 2014. Soils continue to contain large amounts of the fertilizer which has been spread in the past few years. However, next year is likely to be a different story. From now on, unless fertilizer applications return to normal — and with domestic production stagnant, that means more has to be imported — yields will almost certainly fall, threatening production.

CONSUMPTION, PRODUCTION & IMPORTS OF FERTILIZER (MILLION TONNES)

Year	Consumption	Production	Imports
2015	29.0	9.0	19.5 (est)
2014	32.2	8.8	24.0
2013	31.7	9.3	21.6
2012	30.3	9.9	20.0
2011	28.3	9.8	19.4
2010	24.5	9.3	15.3
2009	22.5	8.4	11.0
2008	22.4	8.9	15.4
2007	24.6	9.8	17.4
2006	21.0	8.8	12.1

Source: Association of Fertiliser Mixers. ANDA

Concerned with the fact that Brazil, the world's fourth-largest user of fertilizer, after the United States, China and India, imports such a high proportion of the fertilizer it uses, a few years ago, plans were drawn up for investing up to \$10 billion on increasing output of the three types of fertilizer used, phosphates, nitrates and particularly of potassium, of which almost 100% of what is needed comes from abroad.

It was expected that mining company Vale and oil company Petrobras, which produces virtually all the crude oil and gas used to make certain types of fertilizer, would be responsible for the increases. But both companies have been hit very hard by the fall in the price of both ore and oil, while Petrobras has been damaged by a series of serious corruption charges, which have forced it to slash investments.

Vale has withdrawn from a major mining project in neighbouring Argentina, which had been expected to result in large imports coming from there. So there is little hope of any increase in domestic output of a commodity which costs about

\$10 billions to import each year, for many years to come.

The economic model adopted 12 years ago by the left-leaning 'workers party' which gave priority to increasing the wealth of the less well off, and neglecting investments in infrastructure and industry has run out of steam. Many policies are in the process of being reversed, but the hard pressed government, whose popularity has plummeted, is having great difficulty in changing course. With the exception of agriculture, the Brazilian economy is set to decline by up to 2% this year, and by the same amount next year as well. Not only is so much fertilizer imported, about 40% of it via the port of Paranaguá, in Paraná state, most of it has to travel up to 2,000km to farms, notably in the case of Brazil's leading soya producing state, Mato Grosso. The cost of transport, most done by truck, adds up to 30% to the farm gate price of a tonne of fertilizer. Although gradually more fertilizer is being imported each year via ports in the north east and north each year, as new waterways and railways are gradually opened up, getting fertilizer to farms will always be much more expensive in Brazil as in competitors Argentina and the United States. But the distant centre west is now the only region in Brazil where there is sufficient spare land to plant the extra soya and maize the world will need, and for the extra beef cattle to be raised as well. It is estimated that about 25 million extra hectares will have to be planted to soya and maize by 2025, if supply is to keep up with demand. If more land is planted, up to twice as much fertilizer will be needed, particularly as soils in Brazil are relatively poor. Both cattle, and increasingly commercial plantations of eucalyptus, a commodity demand for which remains very strong and profitable, are using increasing amounts of fertilizer, as new technology, notably the increased use of cloned varieties, allows higher yields, but require more fertilizer to achieve them. Studies have indicated that in the next 20 years, the amount of fertilizer needed in Brazil will have to increase to close to 30mt a year, and with little extra domestic production in the pipeline, most of the

extra will have to be imported. Until a few years ago, the trading companies which handle the great majority of the grains, as well as sugar grown in Brazil, used to supply farmers with the fertilizer they need. It used to be exchanged for the commodities farmers delivered to them, in a kind of barter. But because the volume involved and also the amount of money changing hands had become so great, companies such as Cargill, Bunge, ADM and Dreyfus have gradually sold their fertilizer processing plants, most of which are located near ports, to international giants such as Mosaic, and Yara, which are not much concerned with encouraging more production in Brazil, or cutting costs.

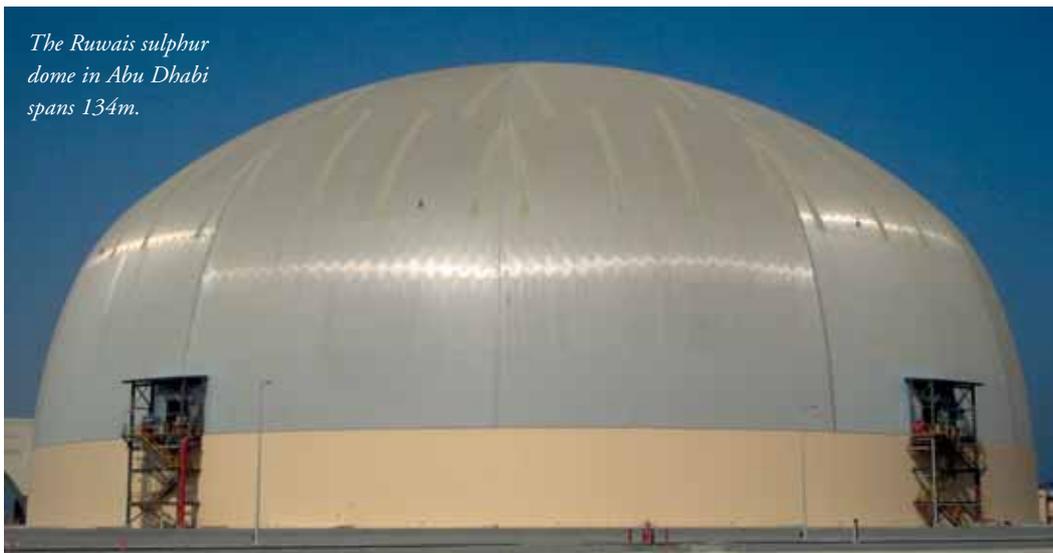


Taming temperamental piles

It's not easy storing the most corrosive stockpiles in the world — a fact the fertilizer sector knows well, writes *Melanie Saxton of Geometrica*. The industry faces this reality on a daily basis as they handle organic or synthetic piles of ammonium nitrate, gypsum, phosphate, potash, soda ash, sulphur, urea and manure. The key is to cover these reactive raw materials efficiently — while treading softly around Mother Nature.

Quayside, mountainside or in a desert, Geometrica specializes in domes and vaults to cover corrosive stockpiles around the

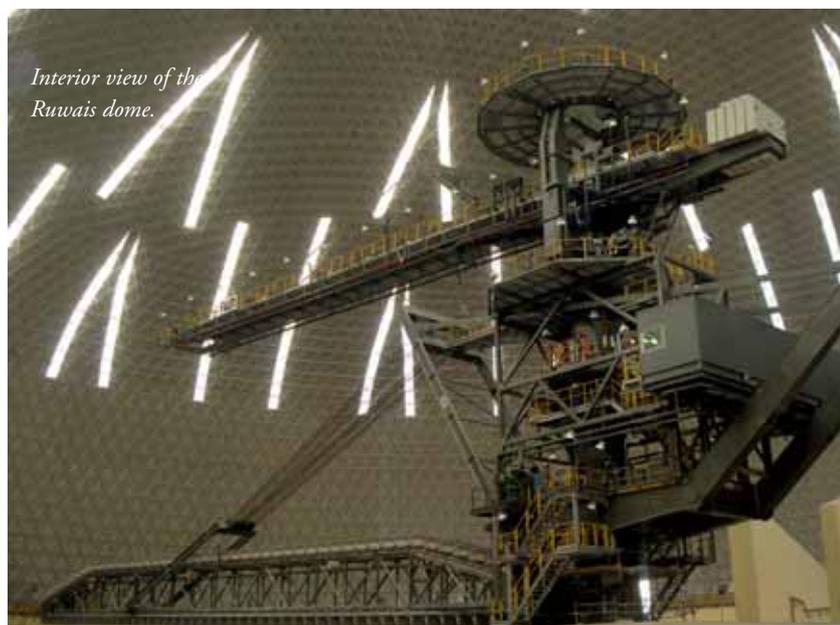
The Ruwais sulphur dome in Abu Dhabi spans 134m.



SUPERB SULPHUR STORAGE

Fertilizer manufacturers face a host of issues. Their piles have been known to wreak havoc on traditional structures inside and out. The materials they handle are often combustible and caustic to the environment. Sulphur, for instance, is known to explode on contact with oxidizing agents and can react violently when exposed to finely divided metals, alkali, and mineral acids. Sulphur also corrodes damp steel and attacks a storage structure's metallic components.

Geometrica domes are ideally suited to these extremes and offer planet-friendly solutions to interior and exterior exposure. The goal, as always, is to help manufacturers responsibly store and handle sensitive raw materials. Geometrica specializes in 'green' building infrastructure that defies corrosion while protecting landscapes, crops and communities. The Ruwais sulphur dome, located in the UAE, is an example of well ventilated circular storage engineered for flexibility and customized to suit the project's specific materials handling needs, site specifications and design preferences.

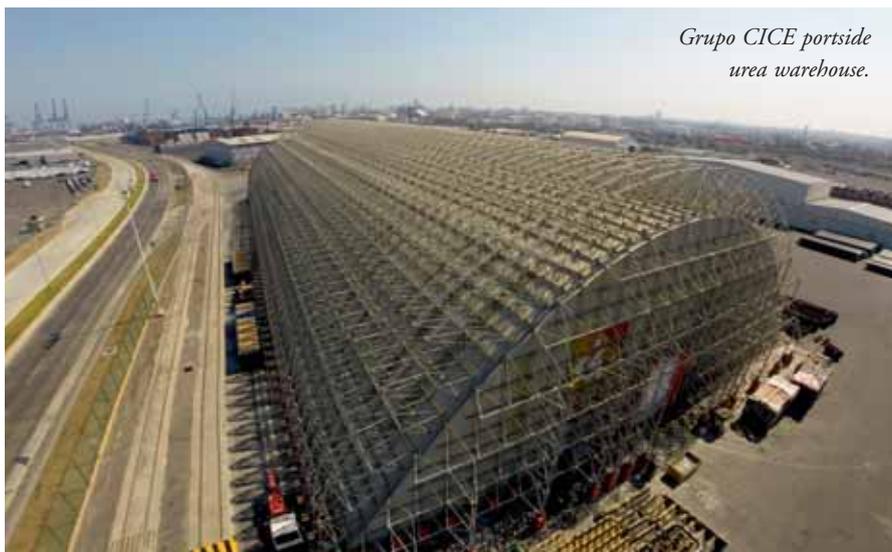


Interior view of the Ruwais dome.

world. It helps fertilizer manufacturers safely store and handle inventories with 'green' building solutions that defy caustic agents. Geometrica's superstructures can be built over operating stockpiles with zero downtime and no loss of productivity. These domes and vaults and have lower overall lifetime costs than conventional buildings, with incredibly flexible design options to accommodate irregularly shaped stockyards, rugged slopes, typhoon-force winds, punishing snow loads and brutal climates experienced in the fertilizer sector. They provide eco-friendly protection against the most hazardous culprits: seepage, bogging, overflow, exposure to moisture, groundwater contamination, saltwater and pollution in oceans.

SOLUTIONS FOR UREA STORAGE

Likewise, urea is another challenging raw material. It must be stored with care, as its storage and salt water exposure combine



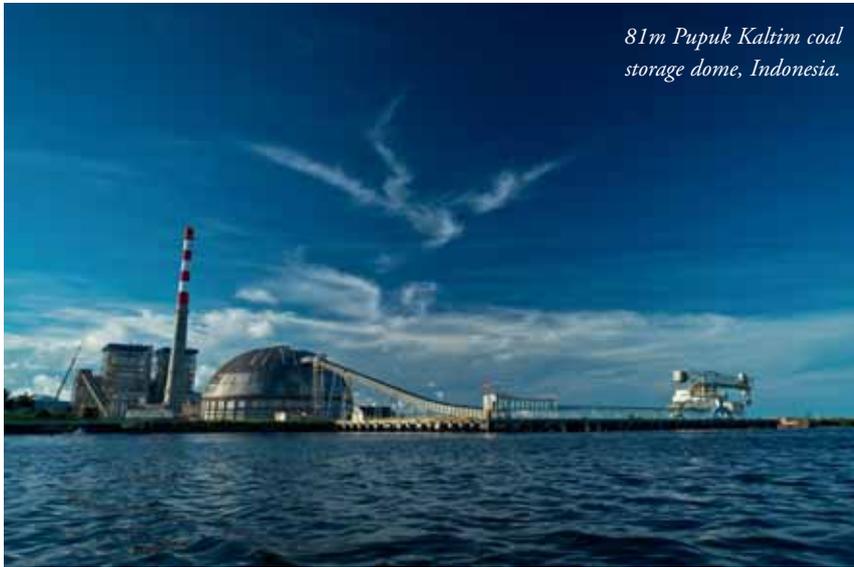
Grupo CICE portside urea warehouse.

to torture metal. Geometrica's domes and vaults overcome such obstacles with innovative design-build applications. For instance, a lightweight skeleton for Grupo CICE was built of high-strength aluminium alloy and left exposed. This Freedom® barrel vault has a revolutionary longitudinal and vertical span protected by FRP underside cladding.

Half-arches were assembled on the ground and lifted onto place with two light cranes. The application required a minimum of space and equipment and permitted other subcontractors to work side-by-side on site. Today the superstructure spans 120m in Veracruz, Mexico and stores up to 15,000 tonnes of urea while waiting for transport. It effectively withstands corrosive attacks from inside and outside the building.

SALTWATER DEFIANT, EARTH FRIENDLY

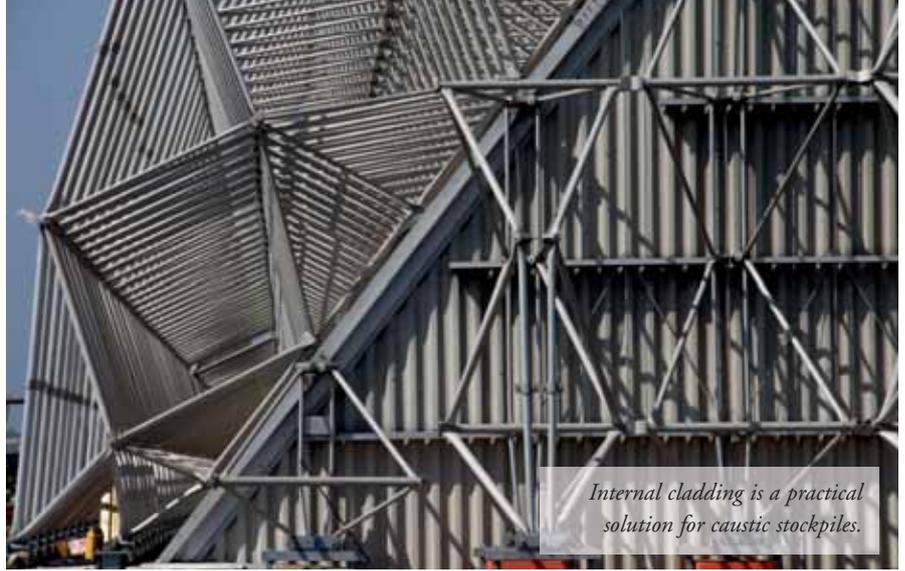
'Sea coast friendly' is a good way to describe Geometrica domes



81m Pupuk Kaltim coal storage dome, Indonesia.

in marine environments, from the Gulf of Mexico to Asia's tropical rain forests to estuaries along various continents. Geometrica's technology helps portside fertilizer suppliers overcome a very real 'double threat' of exposure to caustic bulk combined with the corrosive nature of saltwater. Geometrica provides ancillary port infrastructure for solid bulk materials such as fertilizers and coal, which are loaded from the stockpile or unloaded from the ship. The company's superstructures offer efficiencies with lower initial and lifetime costs — and also stand up to the typhoon force-winds commonly found in such areas. Galvanized-steel dome structures are clad with aluminium sheeting, combining the strength of steel with the corrosion resistance of aluminium, while also meeting National Fire Protection Association guidelines for control of confined dust.

On the other side of the world, Geometrica designed a coal storage circular dome for Indonesia's largest



Internal cladding is a practical solution for caustic stockpiles.

fertilizer producer, PT Pupuk Kalimantan Timur (Pupuk-Kaltim), and met very specific logistical and environmental needs. Pupuk-Kaltim chose to use only clean-coal technologies, including a circulating fluidized-bed boiler, a coal-storage dome and a continuous barge unloader. These technologies had earned recognition for their successful use at the JEA Northside power plant in Jacksonville, Florida (another Geometrica project) and help keep the environment around the facility pristine. Geometrica installed an 81m circular dome requiring a 10m-high reinforced concrete perimeter ring wall to combat typhoon-force conditions, covering 40,000 tonnes of coal, plus a coal stacker and a portal reclaimer.

SEAMLESS INTEGRATION

All stockyard operators need efficient and economical materials handling solutions. With spans up to 300m of barrier-free interiors, Geometrica's domes and vaults make full use of space and can be installed over existing stockpiles with no loss of operations. It designs solutions that harmoniously accommodate traffic, machinery, personnel and inventories. Domes are designed to integrate seamlessly

with unloading, conveying, storing, reclaiming, bagging, distribution, control and supervision processes.

Geometrica's corrosion-resistant dome components are prefabricated, pre-sorted, packaged and shipped to sites. They can be installed by local labour without welding, special tools or heavy equipment.



Interior view of Pupuk Kaltim coal storage for boiler plant.

Fabric buildings are a safe, cost-effective storage solution for fertilizer



A fabric liner is an additional line of defense against rust, and provides a clean finish.

CUSTOMIZABLE, QUICK-TO-INSTALL FABRIC BUILDINGS RESIST CORROSION AND PROTECT INVESTMENTS

Modern farming practices require fertilizer to condition the soil. Fertilizer handling is a highly specialized practice, and the storage and blending of fertilizers and associated chemicals present some tough challenges. Fabric structures are perfectly suited to meet these challenges. Corrosion-resistant, versatile, climate-responsive and fast to build fabric storage structures have come a long way in a short time, thanks to a combination of subtle improvements and dramatic new strides in engineering.

Legacy Building Solutions company has designed, manufactured, and installed over 240,000ft² (22,297m²) of fertilizer storage buildings in the US and Canada. The largest is a 66,000ft² building in Carseland, Alberta; the smallest, a 6,000ft² structure in Athens, IL. Fertilizers stored include urea, MAP, DAP, MEZ, ESN, nitrogen, phosphate, potash, sulphur, zinc and YaraVera, for clients ranging from farmers' co-ops to commercial fertilizer companies and elevators to feed and transportation companies.

"Hands down, fabric buildings are the best long-term option for fertilizer storage," said Paul Smith, Sales and Project Design Manager at Legacy Building Solutions, "because they offer so many advantages over other building types. They are fully customizable, and they can be installed in one-third of the time as compared to a traditional building. In addition, their parts last much longer and are much easier to maintain, which drastically reduces lifecycle costs."

RESISTANCE TO CORROSION

Granular fertilizer tends to coat everything in a fine dust. Depending on the chemical content of the fertilizer, this can

cause the structure to corrode. Steel buildings can be eaten by rust in just a few years, and even wooden buildings are vulnerable to rust at the joists and fasteners. By contrast, structural fabric is impervious to corrosion. Legacy uses high-density polyethylene (HDPE) and polyvinyl chloride (PVC) fabrics, and offers optional flame retardant fabric. With proper ventilation, fabric structures 'sweat' less than buildings made of more conductive materials, such as steel. For the ultimate in rust protection, a fabric interior liner seals the structure from the inside out — keeping the fertilizer away from the steel structure, and stopping corrosion before it even happens. It also provides a clean finish inside the building. Purlin caps are an additional step to guard against corrosion.

ABUNDANT CLEAR-SPAN SPACE

Large-scale fertilizer operations require abundant, column-free, clear-span spaces. Combining lightweight architectural fabric with the proven strength of a solid steel frame allows buildings over 300 feet wide and of any length which can be divided into separate bays to store various types of fertilizer before mixing. The client can specify the exact size of the building. Wide portals and jack beams support doors large enough to allow easy access, reclamation, and transloading for semi trucks, loaders, portable hoppers and other large equipment.

TEMPERATURE STABILIZATION

Fabric is a climate-responsive building material. Even without insulation, fabric structures hold the inside temperature rather than magnifying the outside conditions. This results in temperatures up to 20° cooler than the outside temperature on



Translucent fabric invites daylight. Fabric buildings can be equipped with conveyors.

a hot day — lowering the risk of hot spots, and preventing condensation that might otherwise drip on stored fertilizer and chemicals, causing clumping.

About half of all the potash in the world comes from regions in Canada with harsh winters, heavy snows and strong winds. Legacy's structures are engineered to withstand high winds and snow loads as required by local building codes.

PREVENTION OF CONTAMINATION

Fabric structures prevent nitrogen leaching and groundwater contamination. Combining a protective fabric roof with a concrete foundation keeps stored fertilizer dry and contained, maintaining the quality of the fertilizer and protecting the surrounding area.

MAXIMIZING LAND

Using a concrete foundation with stem wall increases storage capacity and maximizes the land available for construction. In most cases, equipment such as conveyors, cranes and conditioners can be mounted to the building frame for the most efficient operation when receiving and reclaiming granular or prilled fertilizer.

CASE STUDY

Legacy was contracted to design, engineer and construct a bulk fertilizer plant for a large agricultural producer in Albert City, Iowa. Measuring an impressive 120 by 420 feet with a peak height of 63 feet, the structure features 24-ft. sidewalls comprised of 10-ft. fabric sides sitting atop a 14ft concrete wall. The building can store up to 32,000 short tons of bulk dry fertilizer, which is distributed

by rail and truck to retail and wholesale customers.

A previous fabric structure on the site had a hoop frame that had become unsafe due to severe rust. The new building has a durable

rigid frame, and was specially engineered to fit the existing foundation and conveyor. It's fully lined to protect the structural steel from fertilizer. The polyethylene tension fabric roof uses no winch straps or block to further protect the most vulnerable building components against corrosion. The structure is rated for 90mph (144.8kmph) winds and 35PSF ground snow.

Ventilation is assured thanks to mesh vents in the endwalls and mesh soffits and peak vents in the roof. While unloading potash cars shortly after the building opened, the ventilation system was found to significantly reduce dust concentration.

Tension fabric buildings continue to grow more popular as a dependable and cost-effective solution for storing fertilizer. A combination of structural strength, flexibility, resistance to corrosion, and installation speed makes fabric the logical choice.

LEGACY BUILDING SOLUTIONS

Legacy Building Solutions specializes in the innovative design, engineering and construction of fabric-covered buildings. The company provides full construction project delivery from concept to completion, including renderings, foundation design, installation, and project management.

DC

This corrosion-proof fabric building in Iowa stores potash.





End in sight to Brazil sugar crisis



Patrick Knight

The calamitous five years for Brazil's sugar industry may be over, as the world price is set to rise, and a hitherto hostile government is on the defensive.

The past few years have been calamitous for Brazil's sugar and alcohol industry in Brazil, by far the world's largest producer of sugar cane and until very recently, responsible for half all the sugar traded worldwide.

Five years during which sugar prices were low, a much longer period than usual, coupled with the complete lack of support from an unsympathetic government, has forced the industry in Brazil to shut down of 80 of the country's 300 or so mills. Brazil's share of the 45mt (million tonnes) of sugar traded worldwide each year, previously more than half, has slipped to about 45%. All but the most powerful companies have been pushed deep into debt. Most companies are now being forced to sell ethanol fuel for about 10% less than it costs to make, in a desperate effort to raise the cash they need to keep going.

Numerous companies either have left, or would like to leave, the industry, including such international giants as trading company Bunge and Spain's Abengoa. But they have been unable to find buyers for mills they bought a decade ago, even for less than half what they paid for them. Many mills are selling some of their land for building or other purposes to raise cash, others are planting crops such as eucalyptus on hilly parts.

With luck, the situation will improve next year, largely because up to 5mt less sugar will be produced worldwide in 2016 than will be consumed. If a prediction made by the International Sugar Organization, the ISO, is correct and this largely depends on what happens in India and Thailand, both of which have pushed up output sharply in the past few years, it will

be the first such shortfall for five years. Up to 20mt of sugar are now in stock, however, so sugar prices seem unlikely to fall soon, or by much.

Many companies in Brazil are being hurt by the fact that the local currency, the real, has fallen by 30% against the US dollar in the past year. This means that servicing the industry's large foreign debts costs more to service. But the weaker real means Brazilian sugar can now be exported for a lower price than most other countries can manage, yet still be profitable.

The left-leaning government of the past few years has been extremely bad news for Brazil's sugar industry. But so many things have gone badly wrong with the Brazilian economy in recent months that the chastened president, Dilma Rousseff, is now threatened with impeachment. With unemployment rising fast and many unable to keep up with debt payments, Rousseff is now only popular with 8% of voters. With the country in recession, tax revenues are shrinking, so the government has been forced to change course. Some measures which benefited the sugar industry, and which were scrapped a few years ago, have been re-introduced, amongst them a tax on fossil fuels.

Scrapping the tax forced down the price of petrol, which in turn put a cap on the price at which ethanol fuel could be sold. The recent rise in the tax on fossil fuels has reversed this situation, and as a result, about 1.5 billion litres of ethanol have been sold each month during 2015, 20% more than in 2014. The proportion of ethanol blended with all gasoline has also been raised from 25% to 27%, which has created extra demand.

A sales tax on ethanol was always kept low in Sao Paulo, Brazil's leading sugar producing state, but other sugar producing states have now followed suit. Ethanol is now more attractive

than gasohol in states which among them contain 60% of Brazil's car fleet.

The sharp fall in the prices of many commodities, coupled with gross mismanagement of the Brazilian economy and news of widespread corruption, notably of Brazil's state-run oil company Petrobras, has resulted in the country's currency falling by more than 30% against other currencies in the past year. This is notably the case against the US dollar, in which the world sugar price is set.

The weaker real is compensating for the fact that the world price of sugar is now 23% lower than it was 12 months ago. As well as making exporting sugar more profitable, the weak real also means considerably more ethanol is being exported this year, notably to the United States.

All but the few financially strong companies are having difficulty in paying their debts, a state of affairs which makes it seem likely that a further dozen or so mills will stop working this year. To raise much needed cash, mills are making and selling as much ethanol as they can, even if the fuel is having to be sold at a loss. A record 58% of the 600mt of cane to be harvested in the centre south 2015/16 is being made into ethanol, while before the sugar price began to fall, the same proportion was made into sugar. Most mills are putting very little ethanol into stock, fuel which it will be possible to sell for higher prices when harvesting is completed and the supply slows. The record sales so far this year means the fuel will soon run short. But only the very few financially strong companies, most of them foreign owned, which have been able to stock some ethanol, will make a killing when the price rises.

The past few turbulent years for sugar have coincided with a revolution in the way cane is grown and more importantly, the way it is harvested. 20 years ago, virtually all the cane was cut by hand by an army of workers who migrated from the then poverty-stricken north east. Before being cut, the leaves were burnt off, so that workers were able to cut sufficient cane to make a living. Burning cane caused huge clouds of polluting smoke, and as concern about the negative impact of this grew, pressure for burning the cane to be phased out, increased.

Giant mechanical cutters, capable of cutting up to 1,000 tonnes of cane a day, took the place of men and women. The costly process of substitution — a typical machine costs \$100,000, and a fleet of other vehicles to carry the cut cane from fields to the main roads and mills, also had to be bought — is now virtually complete. Many fewer workers are needed than before, but many of those who remain operate machines and are paid far more than the old style cutters.

With the world sugar price high and demand for ethanol thought likely to rise steadily, the industry set about building a new generation of giant mills a decade ago. Many companies stretched themselves financially to build 100 large new mills and to plant the millions of extra hectares of land needed to grow the cane. The plan was for the extra ethanol would be exported. But it proved impossible to sell as much ethanol to countries which import fuel, as had been hoped.

The discovery of huge reserves of crude oil under deep water off Brazil's shores, brought to a sudden end hopes that Brazil would soon be selling billions of barrels of ethanol around the world. The government, which at one stage was having a love affair with sugar, switched its affection to oil instead.

Mesmerized by the success of state-controlled Petrobras in



finding oil, huge sums were siphoned from the company by politicians and contractors. This has come to light in the past few months and the ensuing scandal has caused the government to stumble.

Much of Brazil has experienced much drier weather in the past few years as in previous times, possibly the result of climate change. Water levels in the lakes which feed hydroelectric power stations and store the drinking water used in the large cities in the south east and north east, have shrunk dangerously low. Many mills had always sold surplus electricity generated from burning the huge quantities of waste left over after sugar has been extracted, in inefficient boilers. The 100 new mills have all been fitted

with the latest generation of fuel efficient boilers, and because electricity has been in short supply because of the dry conditions, it has been sold for record prices. This has helped save many mills.. 'Co-generation', as it is called, is now responsible for up to 30% of the revenues of some mills. Although the summer this year has been exceptionally wet, there are few signs so far of water levels in lakes rising much, as water tables have fallen so much. With the building of a new generation of hydro power stations delayed, revenues from the sale of electricity should continue strong for some time.

The cane which used to be crushed at the 80 mills which have shut down, has been diverted to the new ones. However, because little extra cane has been planted in the past few years, demand for cane is now virtually equal to supply. The world needs an extra two to three million tonnes of sugar each year, so more mills will have to be built somewhere to make it. But nobody is considering any new building in Brazil at the moment. There is some talk of Cuba, which at one time produced and exported about eight million tonnes of sugar, making a comeback, and this is not impossible.

There has been a great deal of talk about 'second-generation' ethanol, which can be distilled from the sugar cane waste now burnt in boilers, or left to rot in the fields. The leaves and tips, as well as new types of 'energy-efficient' cane, which contain less sugar and more leaves than the types now popular, are also used to make this ethanol.

But making 'second-generation' ethanol from cane is a far more delicate process than the traditional one, in which cane is basically crushed between two huge rollers. Second-generation ethanol requires cane to be far cleaner and free of soil and other contaminants than the old method did, so the new process has not been profitable so far.

An increasing amount of sugar is now taken from mills or railheads to ports such as Santos and Paranagua by train. The industry plans for 100% of the sugar to go by rail in the centre south at least, before long.

Up to 10% of the 25mt of sugar now exported around the world by Brazil each year, is now packed in containers. Sugar is able to take advantage of the fact that because so many consumer goods have been imported from China and elsewhere in Asia in recent years, tens of thousands of empty containers are now surplus to requirement in Brazil. Being used to carry sugar is better than for them to leave empty. It is too soon to say whether this scheme will last, as Brazil's imports from China have slowed markedly in recent months. Importing sugar in containers has advantages for some consumers, who can take delivery of the exact amount then need, when they need it. **DC**

BSM: A strong player in the Cyprus shipping industry

Following a 20% increase over the past year in the number of ships managed by its Cyprus-based Ship Management Centre, Bernhard Schulte Shipmanagement (BSM) was a prominent participant in Maritime Cyprus, which took place in the middle of September this year. This increase is underpinned by a strong government and a secure, growing economy which is proving attractive to private equity and shipping companies who are considering the island as a base.

Arthur McWhinnie, BSM (Cyprus) Managing Director, and a Board member of the Cyprus Shipping Chamber said: "The increasing number of companies moving to be based in Cyprus reflects the island's strong economic and geographical position. Cyprus provides all the benefits of being in Europe as well as having close ties to the three continents on its doorstep.

"The growth in the number of ships that BSM manages is a strong endorsement of our focus on providing high quality ship management services, established reputation and prominent position within the industry."

BSM hosted an exhibition stand and reception at Maritime Cyprus, where it showcased its comprehensive ship management and maritime solutions capabilities.



ABOUT BERNHARD SCHULTE SHIPMANAGEMENT (BSM)

BSM is an integrated maritime solutions leader, with more than 130 years of experience in the shipping industry. Managing a fleet of 600 vessels, its 20,000 employees globally enable it to deliver ship management services through a network of nine ship management, 23 crew service and five wholly-owned maritime training centres across the world. Alongside its comprehensive ship-management services, BSM offers a suite of complementary maritime solutions that are customized to meet individual customer requirements.

NAVTOR accelerates growth in Asia with new Japan office

Less than a year after opening its first office in Asia, Norwegian e-navigation specialist NAVTOR is expanding in the region again — this time with a dedicated presence in Japan. NAVTOR Japan K.K. will help the firm, known for its simple, efficient and cost effective ENC (electronic navigational chart) distribution solutions, continue to roll out its European success worldwide, securing an important foothold in this key shipping arena.

"The importance of Japan to shipping, and to suppliers that serve the industry, can't be overstated," comments Tor Svanes, NAVTOR CEO.

"The market is established, stable and mature, but at the same time defined by owners and operators that invest in state-of-the-art technology, while focusing on absolutely optimal efficiency and operational security. It's an environment that is tailor made for NAVTOR and its e-navigation solutions."

Since the launch of its ENC service in 2012, NAVTOR has rapidly emerged as a European leader in e-navigation, hitting the market with a series of products — such as NavTracker fleet management and NavStation, the world's first digital chart table — that demonstrate its commitment to high-tech solutions that simplify navigator tasks, while enhancing safety, security and efficiency. In its home nation, for example, its ENC service has enjoyed such success that it is now used by over 50% of the entire Norwegian fleet.

Svanes' ambitions for Asia are equally bold. He comments: "We opened the doors of our first office in Asia, NAVTOR Singapore, in December 2014 and we've been pleased to see that the regional market has responded to the benefits of our products and services with the same enthusiasm as European owners and operators.

"As the IMO's ECDIS Mandate continues its gradual roll

out, the global demand for proven e-navigation solutions is booming. This is especially true in Asia, home to some of the world's key shipping lanes. The industry here is very open to innovation, so the way our technology can drive efficiencies through the secure distribution of digital navigational data will be a very compelling proposition. We are sure we can make a real impact on the market here."

NAVTOR Japan K.K. is led by Managing Director Hiroaki Kitano. The business was officially opened in a ceremony at the Norwegian Embassy in mid-September, attended by, amongst others, Svanes, Kitano, and His Excellency Erling Rimestad, the Norwegian Ambassador to Japan.

Kitano is an experienced figure within Japanese and Norwegian business environments, having previously worked regionally for SAS (Scandinavian Airlines). He will now be aiming to build both NAVTOR awareness and a local team, communicating the benefits of the firm's uniquely user-friendly and high-tech solutions to the marketplace.

ABOUT NAVTOR

NAVTOR is a major provider of innovative e-navigation solutions, services and technology for the maritime sector. All of NAVTOR's products and services are developed in line with the company philosophy of simplifying tasks, increasing efficiency and improving operations. Through the application of cutting edge digital technology, NAVTOR's team makes life easier for navigators, and safer, clearer and more efficient for shipowners and operators.

The firm was established in 2011 and is headquartered in Egersund, Norway, with subsidiaries in St Petersburg, Russia (NAVTOR Russia LLC), Singapore (NAVTOR Singapore Ltd. Ptd.), Japan (NAVTOR Japan K.K.) and Sweden (NAVTOR NAUTIC AB).



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Underwriters fall out with expert witness over valuation of fire-damaged vessel

International Transport Intermediaries Club (ITIC) has reported a case in which hull & machinery insurance underwriters instituted proceedings against a marine consultancy firm for alleged negligence in failing to properly review shipyard quotes in respect of the cost of repairing a fire-damaged vessel.

The insured vessel had suffered extensive fire damage. The owners claimed that the ship was a Constructive Total Loss (CTL), alleging that the cost of repairing it was in excess of its insured value.

The insurers rejected this claim, maintaining that the vessel was capable of economic repair. The vessel was ultimately scrapped, and the only remaining dispute was over the amount which the insurers were obliged to pay under the policy.

At an early stage, the owners made an offer to settle the claim by accepting \$1.136m, plus their legal costs. Underwriters did not accept the offer, and litigation was started by the owners. The underwriters engaged a marine consultancy firm to provide expert advice/evidence on what it would have cost to repair the vessel. The consultants issued a report stating that the vessel was not a CTL. This report was based, among other information, on two independent quotations from Chinese shipyards and detailed calculations from the builder of the vessel which indicated that the steel weight for the vessel's accommodation block was 312 tonnes.

The owners in turn submitted the report of their technical expert, which had been prepared using a different, 'newbuild' approach. This report used an estimated steel weight total of 542 tonnes to repair the accommodation block, and concluded that the total cost of repairing the vessel was \$6m, a figure that would have made the vessel a CTL.

Following a joint experts' meeting, underwriters' counsel asked the consultants to prepare their own steel weight calculations, inclusive of the accommodation block, in order to rebut the owners' report. Drawing from their own calculations, the consultants concluded that the shipbuilder's initial steel weight figure was inaccurate and that the cost of repairing the vessel was about \$3.9m in excess of the total insured value. On the basis of this new advice, underwriters settled with the owners for \$1.3m, plus the owners' costs.

Underwriters then started proceedings against the consultants on the basis that they had been negligent in not properly reviewing the shipyard quotes. The underwriters claimed that, had they been properly advised, they would have been able to settle for a lower amount at an earlier stage. This would have reduced their own costs and their liability for the owners' costs.

The consultants pointed out that the underwriters had rejected the owners' earlier offer before they had been engaged, and argued that, for their part, they had relied on the figures provided by the underwriters. Moreover, it was not until after the joint experts' report that they were asked to make their own assessment.

Reporting that the issue was finally settled at mediation, ITIC says, "It is four years since the English Supreme Court held that expert witnesses involved in legal proceedings no longer enjoy protection from liability for negligence. It was a feature of this dispute that there was no document specifying what the consultants had been engaged to do. A large number of disputes involving consultants and other advisers would be avoided if the scope of work was clearly defined beforehand."

ITIC is managed by Thomas Miller.

Fednav's 'Federal Oshima' evacuates adventurer

On 10 October, Fednav Limited, Canada's largest international dry-bulk ocean transportation group based in Montreal, disembarked well-known British athlete and adventurer, Sarah Outen, in Saint-Lambert, QC, after she was picked up by the crew of the *Federal Oshima* on 3 October.

The Fednav vessel, under the command of Captain A. K. Gupta was en route from the Mediterranean Sea to the Great Lakes, when it was contacted by the Maritime Rescue Coordination Center in Falmouth, UK, to evacuate Outen, who was attempting to cross the Atlantic in an ocean rowing boat. Captain Gupta commented, "With the approach of *Hurricane Joaquin*, weather conditions were severe in the North Atlantic—challenging for any seagoing vessel, but particularly perilous for an 18-foot row boat."

Outen was on her last major leg of a four-and-a-half-year journey around the globe using only human power for a fundraising initiative when she was forced to abandon her attempt to row the Atlantic solo after 143 days. Outen, though deeply disappointed that her ocean rowing boat, *Happy Socks*, had to be left behind, is very grateful that the



crew of Fednav-owned *Federal Oshima* was able to evacuate her before she was hit by the hurricane.

Although Outen was picked up from her vessel without incident, her craft was adrift before her travel documents and belongings could be retrieved. At the crew's third attempt, the Fednav ship hooked onto the

smaller boat gone adrift and Outen's belongings were recovered.

"In spite of the high risk to our crew, our first goal is to save a person in distress, which was demonstrated in this evacuation procedure," according to Captain Kumar.

The *Federal Oshima* is crewed by Anglo-Eastern Ship Management Group, known for its qualified, experienced seafarers. Martin Krafft, Senior Manager, Owned Fleet of Fednav Limited had this to say: "We are very happy that the crew of our vessel successfully performed this operation in an extremely challenging situation. To manoeuvre a 200-metre bulk carrier so precisely in such weather conditions is testament to the high level of the ship-handling abilities of our seafarers. Their courageous action and seamanship skills were the key to this successful mission."

Celebrating 50 years of Freightliner

On November 12, Freightliner, the UK's largest rail maritime intermodal operator, celebrates 50 years since the running of its first train which ran from London to Glasgow. Customers, industry representatives and colleagues will mark the anniversary with an event at the National Rail Museum in York, where the Secretary of State for Transport, Rt. Hon. Patrick McLoughlin MP, will deliver a keynote speech.

Since its creation in 1965 as the container arm of British Rail, the nationalized rail operator responsible for most passenger and freight railway services in Great Britain, Freightliner has gone from strength to strength.

In 1996, after three decades as part of both British Rail and the National Freight Corporation, Freightliner was sold through a management buyout (with the backing of 3i and Electra). This move was part of the wider privatization of the UK rail infrastructure and operations.

Since privatization, Freightliner has seen strong growth and has diversified beyond deep-sea intermodal traffic with the creation of several subsidiaries, including Freightliner Heavy Haul, Logico, Freightliner Maintenance, Freightliner Poland and Freightliner Australia. The Group also completed the acquisition of ERS Railways in the Netherlands and, most recently, expanded into the Middle East in the form of a UK consortium.

Earlier this year, Freightliner was acquired by Genesee & Wyoming, a US-based owner of short line and regional freight railroads serving more than 2,000 customers over 15,000 miles of track in five countries.

Jack Hellmann, President and Chief Executive Officer of Genesee & Wyoming, said: "Freightliner is an excellent strategic fit for G&W, adding a world-class intermodal and heavy haul franchise as the foundation of G&W's UK/Europe business and unlocking more opportunities in Australia."

"Working with Freightliner's talented management team, who have a long track record of success in building Freightliner over the past two decades, we expect to grow the business even more and also unlock a range of investment opportunities worldwide."

Freightliner Chief Executive Russell Mears said: "Our 50 year anniversary is a significant achievement. Freightliner is a respected, premium rail brand and our staff, some of whom have been with the company for over 40 years, are proud to be part of a successful organization with such a rich history."

ABOUT FREIGHTLINER GROUP:

Freightliner Group is a leading rail freight provider with businesses in the United Kingdom, Continental Europe, Australia and the Middle East. It employs over 2,500 staff and offers

customers a wide range of rail freight solutions to cater for the requirements of a diverse market sector.

- ❖ **Freightliner Ltd:** the UK's largest transporter and inland terminal operator for the movement of deep sea maritime containers;
- ❖ **Freightliner Heavy Haul:** a leading UK bulk rail freight company setting new standards of reliability, flexibility and customer service in the bulk rail freight sector whilst continuing to invest in innovative solutions for customers' business needs;
- ❖ **Freightliner Maintenance:** operating specialist facilities around the UK, Freightliner Maintenance offers infrastructure services and maintenance solutions for rolling stock.
- ❖ **Freightliner Poland and Germany:** providing bulk rail freight services including coal, aggregates and other bulk commodities within Poland and Germany and cross border;
- ❖ **Freightliner Australia:** transports coal and containerized agricultural products for customers in New South Wales and is an accredited rail service provider in Western Australia, South Australia and Queensland;
- ❖ **ERS Railways:** provides cross border intermodal services connecting the northern European ports of Rotterdam, Bremerhaven and Hamburg to key cities in Germany, Poland, Italy and beyond; and
- ❖ **Freightliner Middle East:** responsible for developing services to support this rapidly growing region. Recently signed a contract to support the development of world-class rail freight services in Saudi Arabia.

Across the Group, Freightliner continues to invest in locomotive technology, wagons and terminal infrastructure to provide safe, high quality, reliable service to customers.

Freightliner Group is owned by Genesee & Wyoming Inc. (G&W). About G&W:

- ❖ G&W owns or leases 120 freight railroads worldwide that are organized in 11 operating regions with 7,500 employees and more than 2,500 customers.
- ❖ G&W's nine North American regions serve 41 U.S. states and four Canadian provinces and include 113 short line and regional freight railroads with more than 13,000 track-miles.
- ❖ G&W's Australia Region provides rail freight services in New South Wales, the Northern Territory and South Australia and operates the 1,400-mile Tarcoola-to-Darwin rail line.
- ❖ G&W's UK/Europe Region is led by Freightliner. G&W subsidiaries provide rail service at more than 40 major ports in North America, Australia and Europe and perform contract coal loading and railcar switching for industrial customers.



350 full vessel coatings achieved with HEMPAGUARD® antifouling product

Just two years after its launch, major manufacturer of marine coatings – Hempel – has announced that its revolutionary award-winning antifouling product HEMPAGUARD® has now been applied as a full vessel coating to more than 350 ships.

HEMPAGUARD® was launched two years ago during London International Shipping Week 2013 after a five-year development programme, and is Hempel's first product to use its proprietary ActiGuard® technology that integrates silicone-hydrogel and full diffusion control of biocides in a single coating. So confident is Hempel of its performance that the company offers the industry's first performance satisfaction guarantee.

To date, feedback from customers confirms that their vessels have remained significantly cleaner, and for longer, than they've experienced with any other antifouling product.

Claes Skat-Roerdam, Marketing Manager, Fouling Control, Hempel A/S commented: "We are delighted with the success of HEMPAGUARD®, it really is a strong endorsement of the protection properties of our product. The combination of silicone-hydrogel and biocide science has revolutionized antifouling technology to deliver excellent fouling resistance — including up to 120 days during idle periods — plus fuel savings of between four and six per cent on average. The fact that more than 350 vessels have now been coated with HEMPAGUARD® proves the value of our new coating".



The coating was introduced to the shipping industry against a backdrop of rising bunkering costs, tightening environmental regulations and the introduction of mandatory Ship Energy Efficiency Management Plans (SEEMP). In October 2014, HEMPAGUARD® won Shipping Efficiency's prestigious Environmental Technology award for making "a significant contribution to environmental impact reduction or prevention to ships."

ABOUT HEMPEL

Hempel is a renowned coatings supplier for the decorative, protective, marine, container and yacht markets. From wind turbines and bridges to hospitals, ships, power stations and

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Hempel's working concept is simple: curious, creative and self-critical, and always aiming to create extra value for its customers.





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Fading enthusiasm for Handymax bulkers



© Pacific Basin.

Richard Scott

Handymax bulk carriers have been a popular choice for shipowners investing in new tonnage during recent years. But this year a distinct lack of enthusiasm is evident, despite expectations of further growth in some trades where these vessels are regularly employed. Continuing severe over-capacity in this sector and adjacent size groups has made a big impact on market sentiment.

Since 2015 began a depressed freight market for bulk carriers of all sizes has prevailed, coupled with greater uncertainty about the timing and magnitude of a sustainable recovery. Fleet growth in the handymax sector, meanwhile, is proceeding at a rapid rate and may continue to do so for some time ahead. Newbuilding deliveries from the huge orderbook accumulated earlier are maintaining a strong flow. Consequently, much less interest in ordering additional Handymax newbuildings is now evident.

Popularity, until quite recently, of these ships was based on ideas about extended employment growth opportunities over many years into the future. Handymaxes in the 40–65,000 deadweight tonnes size group are among the most employable, given their versatility within a very broad range of dry bulk commodity trades around the world. While that view may still be valid in the longer term, weak market conditions currently, and implicitly in the near term future at least, have changed perceptions.

The typical Handymax bulk carrier is a geared (cargo-handling gear) vessel, with cranes and grabs for loading and discharging cargo. Sub-categories within the group are Supramax and Ultramax ships. Installed cargo-handling equipment enables efficient operation in trades where shore equipment is either unavailable or inadequate. Handling cargo offshore, from or into



barges, at an anchorage is also facilitated. Together with a size range acceptable at an extensive range of ports and berths, on the majority of trade routes, while still offering some economies of scale, the result is often an extremely varied employment pattern.

Coal, and grain and soya are commodity trades where Handymaxes are frequently used, and there is sometimes involvement in the iron ore trade. A very wide range of minor bulk trades is also a big category of cargoes for these ships. Minor bulks including steel products, ores and minerals such as nickel ore, other industrial cargoes, fertilizers and agricultural commodities including oilseeds and meals all feature prominently.

FLEET CAPACITY EXPANDS RAPIDLY

Although expansion in the world fleet of Handymax bulk carriers has been decelerating over the past five years, it remains brisk. As shown in the table, growth in 2015 may pick up compared with last year's increase, and another twelve months of further substantial enlargement is expected in 2016 as well.

During the past five years fleet growth averaged 12.4% annually, raising total capacity by almost four-fifths. According to figures compiled by information providers Clarksons Research, Handymax capacity reached 165.8 million deadweight tonnes at end-2014, compared with 92.8m dwt five years earlier. However, annual growth rates diminished from almost 20% in 2010, to 5% in 2014. Last year the number of vessels in the fleet passed the 3,000 mark, reaching 3,114 at year-end.

By the beginning of September this year, an estimated further 5% deadweight capacity had been added in just eight months, boosting the total to 3242 ships amounting to 174.1m dwt.

Within the entire world bulk carrier fleet of all ship sizes, totalling 769m dwt, Handymax tonnage forms a large part, at well over one-fifth.

Focusing on key influences determining fleet capacity, Handymax newbuilding deliveries declined in the past two years, accompanied by substantial scrapping of older or uneconomical tonnage, as the table reveals, causing decelerating fleet expansion rates. However, even last year's relatively slow growth added a net 123 ships, resulting from 194 newbuilding deliveries partly offset by 70 scrappings (recorded demolition sales to scrap yards).

Shipyards around the world completed just over 11m dwt of new Handymaxes in 2014, after much higher levels of over 14m dwt in the preceding twelve months and 19–22m dwt annually in the previous three years. Scrapping was within a 3–5m dwt range in the past three years, compared with much lower volumes previously.

The deadweight tonnage of new Handymax bulk carriers delivered in 2015 as a whole probably will jump sharply to about 15m dwt or more. This estimate is based on figures for the first eight months, showing over 10m dwt already delivered (subject to revision), and ideas about what could happen during the remaining period. Scrapping in the January–August period reached 2m dwt and may approach 3m dwt in the full year, although scrapping predictions essentially are often quite speculative. Consequently, fleet enlargement this year may be about 7%, about two percentage points above last year's growth rate.

Looking ahead to next year, 2016, there are signs that a slightly less rapid increase may be seen. The new vessels flow entering the world fleet may ease moderately, while another

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

	2010	2011	2012	2013	2014	2015*
Newbuilding deliveries	19.0	22.1	20.9	14.6	11.1	15.0
Scrapping (sales)	0.4	2.2	4.7	3.5	3.1	2.8
Losses	0.2	0.1	0.1	0.2	0.0	0.0
Plus/minus adjustments	0.4	0.0	-0.1	0.0	0.0	0.0
Fleet at end of year	111.1	130.9	146.9	157.8	165.8	178.0
% change from previous year-end	+19.7	+17.8	+12.2	+7.4	+5.1	+7.3

source: Clarksons Research, September 2015

*forecast

substantial scrapping period may be ahead. But much depends upon (particularly for demolition sales) how freight market conditions evolve, and also the state of market expectations and sentiment, a big element of which is difficult to predict.

An indicator providing a rough guide to future capacity evolution is the newbuilding order book at shipyards. Following heavy ordering of new Handymaxes in the past two years (especially for the new Ultramax designs of around 60,000dwt), the order book reached a high 49m dwt volume, comprising 810 ships, at the end of 2014. Although deliveries from that total had reduced overall outstanding orders to 38m dwt at the beginning of September this year, according to Clarksons Research calculations, scheduled 2016 deliveries totalling almost 19m dwt are shown, implying another large capacity addition.

Within the entire global Handymax newbuilding order book, the Supramax sub-category of 50-60,000dwt ships became dominant until, a couple of years ago, the newer, larger Ultramax

60-65,000 dwt vessels were introduced. Currently, over four-fifths of the Handymax orders deadweight capacity is comprised of these Ultramax vessels.

Contracts for new Handymaxes were greatly boosted in 2013 and 2014 by a remarkable ordering spree. Renewed interest reflected perceptions that a freight market recovery might be on the horizon. Coupled with attractive prices quoted by shipbuilding yards, shipowners saw a strong incentive to invest. During those two years 787 Handymax ships in this size group were ordered, totalling over 48m dwt.

Recently a dramatic change in newbuilding ordering dynamics has been seen, one of the most striking in the modern era. This change, a virtual collapse in new orders placed, has affected all bulk carrier size groups. Within the Handymax sector ordering is now minimal, just 21 ships of 1.2m dwt in the 2015 first eight months, from 292 in the whole of last year. The decline reflects very low current freight rates and modified, less optimistic views



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of potential for a market recovery amid signs that trade growth prospects have deteriorated while the fleet continues to grow briskly.

This change will eventually affect the pace of capacity additions a couple of years ahead. In the meantime, deliveries from the large orderbook which is still equivalent overall to 22% of the current world Handymax operating fleet, will continue enlarging capacity markedly.

Another influence which may prevent, or at least restrain, any sharp slowing of fleet growth in the immediate future is the apparent limited potential for scrapping of old tonnage. The Handymax fleet is relatively young. Only about 15% is over 14 years old, and within that volume less than half is over 19 years old, mostly in the 40–50,000dwt size sub-group. Thus it seems difficult to foresee greatly expanded scrapping emerging over the next twelve months.

EMPLOYMENT OPPORTUNITIES CHANGING

Typical features offered by a Handymax bulk carrier ensure wide employability. At least some parts of all dry bulk commodity trade sectors are accessible and in most, large or all parts. In practice, however, major proportions of iron ore and coal movements do not normally employ Handymaxes, because the bigger Panamax, Kamsarmax and Capesize bulk carriers can be accommodated on many trade routes. Preference for these larger unit sizes reflects greater economies of scale and thus, usually, cheaper transport.

One of the most prominent employment sources for Handymaxes is coal trading. Both main parts, steam and coking

coal trade, often use bigger ships, but Handymax size cargoes amount to huge volumes. Seaborne coal trade overall is the second largest global dry bulk commodity trade after iron ore, amounting to a massive volume of just over 1,200mt (million tonnes) last year, and comprising over one-quarter of all global dry bulk cargo movements.

A significant aspect, which has emerged recently, is a much more pronounced impact from negative influences affecting coal import demand around the world. After growing at strong annual rates, a decline in global coal trade looks likely during 2015 as a whole. Movements of both steam coal (used chiefly in power stations, but also in cement manufacturing and for other industrial processes), and coking coal (used in the steel industry) could be lower than last year's volumes. Steam coal is the largest category, comprising over three-quarters of the total.

Among coal trades employing Handymaxes extensively, shipments of predominantly steam coal from Indonesia rose to become the world's largest coal export volume for an individual country in 2013. But this top position was not maintained, and shipments fell by 7% to 356mt last year. That annual volume is the equivalent of about 6,800 Supramax size cargoes, although many larger ships are employed. Short-haul shipments to China form a large part of Indonesia's exports.

Weakness in China's coal import demand has been adversely affecting Handymax usage. Last year China's overall coal imports (including lignite), a major part of world trade in this commodity, declined by 36mt or 11%, to 292mt. This year a greater percentage decline may be seen. In the first nine months of 2015, the total reportedly was down by almost 30% compared



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with last year's same period, at 156.4mt.

The grain (including soya) trade also provides extensive Handymax bulk carrier employment, featuring highly variable and unpredictable changes in geographical patterns and quantities. During the past crop year ending mid-2015, global trade in wheat and coarse grains, and also in soyabeans and meal, increased robustly, but over the current year ending mid-2016 some negative factors are likely to weaken global import demand.

Contributing to recent strength in grain and soya movements were higher imports into many countries, facilitated by abundant export supplies around the world and lower international prices. According to International Grains Council calculations, global trade in wheat plus corn and other coarse grains increased by 12mt (4%) in crop year 2014/15 ending June, reaching 322mt. Global trade in soyabeans and meal was 12mt (7%) higher in marketing year 2014/15 ending September, at over 181mt, based on US Dept of Agriculture estimates.

Over the past twelve months, Handymax grain trade employment opportunities benefited from larger imports into Africa and Middle East countries, while China and other Asian countries raised their purchases. Involvement in the soya sub-sector was supported by China's continued upwards import trend, as well as increased volumes into other parts of Asia, the European Union and elsewhere.

During the year ahead, 2015/16, the upwards trajectory of world soya movements is expected to persist, as China and others buy additional cargoes. Conversely, global wheat and coarse grains trade could see lower imports into a wide range of countries.

Numerous Handymax size bulk carriers regularly carry minor dry bulk cargoes. Many elements of this group of commodities are large, not small and collectively amount to massive annual volumes. The commodity range is wide and, until last year when the total is estimated to have reached over 1,500mt, growth had been rapid for several years. But in 2014 the overall increase apparently was minimal.

Steel products trade (coil, sheet, plate and other items), and forest products trade, are the biggest individual minor bulk components, although not all quantities are carried by bulk carriers. Bauxite/alumina for the aluminium industry, fertilizer raw materials and semi-finished fertilizers, cement, as well as ores and minerals such as nickel and manganese ore, together provide very big tonnages.

As an example, Handymaxes frequently carry steel products exports from China. This trade has expanded strongly over the past two years, amid slowing Chinese domestic steel consumption and surplus capacity. The annual total of China's steel exports to all destinations jumped by 51% to reach just under 93mt in 2014, and could exceed 100mt this year. In the first nine months of 2015, reportedly the volume rose by 27%, to 83mt.

THE ULTIMATE HANDYMAX

Over the past two years, Ultramax bulk carriers of 60–65,000dwt, at the top end of the Handymax size range, became the principal focus of attention for shipowners investing in new Handymax tonnage. Despite the abrupt downturn in contracting activity seen this year, Ultramaxes continue to dominate the global order book and future delivery schedules, as a result of the heavy ordering seen in 2013 and 2014.

A typical Ultramax provides a 63,000 or 64,000 total deadweight capacity, and is equipped with the standard cargo-

handling gear of cranes and grabs for loading and discharging at a berth or anchorage. These new designs also offer another attractive economic advantage, which was even more valuable when fuel costs were much higher up to almost the end of last year: improved fuel efficiency is a key feature.

The advantage possessed by an Ultramax is clearly seen in trades where a cargo of around 60,000 tonnes — often coal, or minor ores or other bulks — needs to be lifted from barges at an offshore transshipment terminal and then discharged at a similar installation at the other end of the voyage. This employment pattern occurs in many shorter haul trades within the Asian region and elsewhere. The Ultramax can self-load and self-discharge, but if an older gearless vessel is used, such as a panamax of similar capacity, a floating crane is required, significantly raising transportation costs.

Chinese shipbuilding yards in particular marketed standard Ultramax designs which have proved popular. The 'Crown 63' of 63,000dwt and the 'Dolphin 64' of 64,000dwt were seen by shipowners as likely to prove efficient and potentially profitable, resulting in the yards obtaining many orders.

Expectations of expanding cargo volumes available for Ultramax size bulkers underpins interest in these vessels. In some trades, individual cargo sizes commonly lifted have been increasing. The Supramax, typically 52–57,000dwt, was the preferred sea transport unit until quite recently, compared with small Handymaxes up to 50,000dwt. But a ship able to carry a somewhat larger cargo volume while remaining within other size restrictions is now seen as widely employable. Commodity trades to Asian destinations, often intra-Asian trading, are a particular focus of attention.

A SUBDUED HANDYMAX MARKET

Freight rates for Handymax bulk carriers have been weak this year, reflecting continuing surplus capacity in this and other vessel size groups. Sustained rapid enlargement of the world Handymax fleet, amid slowing growth in some key bulk trades employing these ships, has resulted in generally subdued market conditions.

During the first quarter of 2015 Handymax freight rates fell steeply to very low levels. The Baltic Supramax Index dropped below 500 points. In subsequent weeks a modest revival ensued, gaining momentum after mid-year when the index remained above 800 for several weeks. Renewed weakness was seen during September and, by mid-October the BSI had declined to below 700 points.

What is the outlook for this market sector over the next twelve months? Although the Handymax category is a distinct market sector, it is not isolated from the bulk carrier market as a whole, where considerable over-capacity looks set to persist for some time. There are signs of further slowing in overall world bulk carrier fleet growth during 2015 (although not in the Handymax category), bringing it more into line with previous expectations of trade expansion. But indications now clearly suggest that trade is not increasing as expected earlier, and is actually decelerating markedly.

Slowing global seaborne trade development recently, and few convincing signs of a robust pick up next year, has intensified uncertainty about the future freight market trend. Also, it is not altogether certain that a further slackening of bulk carrier fleet growth will be seen in 2016. For the Handymax sector individually, deadweight capacity may continue expanding quite rapidly next year. So a sustainable solid improvement in freight rates may remain elusive in the near term future.



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New shuttle rail service between Malmö and Stockholm

Green Cargo's new direct shuttle between Malmö and Stockholm is now in operation, linking CMP and Northern Harbour in an attractive new intermodal logistics service.

"The collaboration with Green Cargo in Northern Harbour commenced in early 2014 and gave us access to a large network with numerous destinations", says Ann-Charlotte Halldén Åkeson, Key Account Manager within CMP. The service and coverage is now being improved even further through a direct shuttle with competitive transit times and flexible handling. This gives the customers access to a comprehensive logistics solution with the port in Malmö as hub.

Green Cargo is Sweden's most experienced actor within rail logistics. The company offers eco-labelled door-to-door transports in a network that extends throughout Sweden. Green Cargo also reaches thousands of locations on the European continent via partners.



FREQUENT DEPARTURES – FAST DELIVERIES

The service is based at CMP's combi-terminal in Northern Harbour, with daily departures Monday to Thursday and on Sundays. The customers can drop off freight as late as 1900hrs and have it delivered at 0630hr in Stockholm/Årsta the next morning. For example, Green Cargo currently handles parts of the RoRo traffic that arrives from the continent via Finnlines.

"As we see it, there is also great potential for other companies that have operations in the vicinity of Northern harbour, or in other parts of Malmö", says Ann-Charlotte Halldén-Åkeson. The new direct shuttle is moreover an environmentally-friendly alternative to the many road haulage services between Malmö and Stockholm.

"CMP has both the space and overall capacity in Northern Harbour to handle combi-traffic effectively", she concludes. "In the long term we also feel that the direct shuttle will be an asset for those companies that have now started to establish themselves in the nearby Malmö Industrial Park."

Omani dry bulk to benefit from new rail links

Once the new rail network in Oman is connected to the country's three main ports, dry bulk traffic carried by rail is expected to increase exponentially. Currently, most mineral exports are handled by road.

Salalah currently handles around 10mt (million tonnes) of mineral exports, mostly limestone and gypsum, which requires 500–600 truckloads a day, inbound from the hills around Thamrait. One train loading up to 10,000 tonnes could replace around 300 trucks, meaning two trains per day

could totally eliminate road haulage. As a result, capacity at the port could be raised from 10mt to 50–60mt. Similar figures could be posted at Duqm and, to a lesser extent, at Sohar.

Overall, mineral exports could increase tenfold.

Oman Rail is planning to deploy rotary railcar dumper technology at the ports to ensure that one vessel can be loaded per day rather than one vessel every six days, which is the case at present.

Barry Cross

Magdalena River to be operational 24/7

In Colombia, the Magdalena River will have night signalling and satellite navigation systems in place by the end of this year, which will allow 24 hours a day operation.

The opening of the \$117 million Impala Port in Barrancabermeja is also bound to increase the amount of cargo being transported to and from the east to the country. This will include not only hydrocarbons, but also coal, corn and cement, all of which will arrive at this new hub port by road. For this year, Impala Terminals Barrancabermeja is expected to handle around 30,000 tons of dry bulk products to silos, in addition to 720,000 barrels of petroleum.

BC



New cement grinding plant for Pecém

Polimix is to invest \$44 million in building a cement grinding plant in the port of Pecém's industrial area, in Brazil. This will occupy an area of 34ha and produce up to 900,000 tonnes of cement annually. According to the company, the location was favoured given the strong local market and good connecting highways with surrounding states. Construction was set to start in October, with operations commencing within three years. *BC*

Liebherr MHCs for Lirquén

In Chile, Puerto Lirquén has acquired two Liebherr 600 HR+12 mobile harbour cranes. These have required investment of \$10 million. These are now the two largest cranes working in this southern Chilean port, given that they are able to handle even Capesize vessels.

"These will allow us to handle larger ships and therefore offer an excellent service," noted terminal managing director Juan Alberto Arancibia.

The main tower of the crane is 12 metres high, with loads of up to 208 tonnes being supported beneath the boom, which has an operating radius of 58 metres. *BC*

LDC eyes Brazilian investments

French multinational Louis Dreyfus Commodities (LDC) says it is "eager" to participate in new rail and port tenders in Brazil. Andrew Roth, chairman of the company in Brazil, says that, for several years, LDC has invested heavily in logistics in the country as a means of remaining "very competitive".

The current focus of the business is in the northern arc of Brazil, but Roth says that this will not rule out bids being made for concessions in other parts of the country.

"We have allocated capital to bid for concessions, if they are attractive," he said.

According to LDC, some three million hectares of new agricultural land will be opened in the north of Brazil in the next few years, which will produce a further 30 million tonnes of grain. Given that China will account for the majority of this over the next decade, an estimated five new ports will have to be built to accommodate this extra traffic.

"Brazil," said Roth, "is the country with the greatest potential to meet Chinese demand."

He added that the appreciation of the dollar against the local currency, the real, would help Brazil, because manufacturing costs would become more competitive compared to other countries where LDC has a presence. Current exchange rates were also making it possible for producers to maintain margins, despite lower commodity prices.

"Brazilian agriculture will continue with the same competitive environment and low prices," he said. *BC*

Chinese give the thumbs up to Valemax bulk carriers

The Chinese government has finally given its official blessing for Vale to deploy its fleet of 34 400,000dwt vessels into domestic ports, having previously prevented their deployment for three years.

Dalian, Ningbo, Qingdao and Tangshan Caofeidian have all been given clearance to receive the Valemax ships, given that they meet the technical standard laid out by official government bodies.

Vale originally designed the ships with China in mind, since they would bring down the cost of moving consignments of iron ore to that country, only for them to be effectively embargoed in 2013 on the grounds of safety.

Earlier, in September 2014, Vale struck an agreement with China Ocean Shipping Company (Cosco) to both sell and hire it some of its existing fleet of Valemax bulk carriers. This was followed in February of this year by China issuing its own guidelines for the design of such large vessels.

It is expected that a saving of \$4.00 to \$6.00 will now be made in shipping each tonne of iron ore between Brazil and China, which is key to companies being able to make a profit at a time when the price of iron ore has slipped to its lowest level since 2009. Vale, however, has struggled in this market, given longer journey times than those offered by Australian rivals Rio Tinto and BHP Billiton.

According to official statistics, Australia delivered around 241.7mt (million tonnes) of iron ore to China in the first five months of this year, up 14.8% over the previous year, with Australia now accounting for 64% of the total. For its part, Brazil was responsible for sales of 70.89mt, or 18.7% of all Chinese iron ore imports.

Both Rio Tinto and BHP Billiton have announced a rise in production in the second half of this year as a means of competing yet further with Brazil, although the move is seen as possibly driving down prices to historically low levels. *BC*



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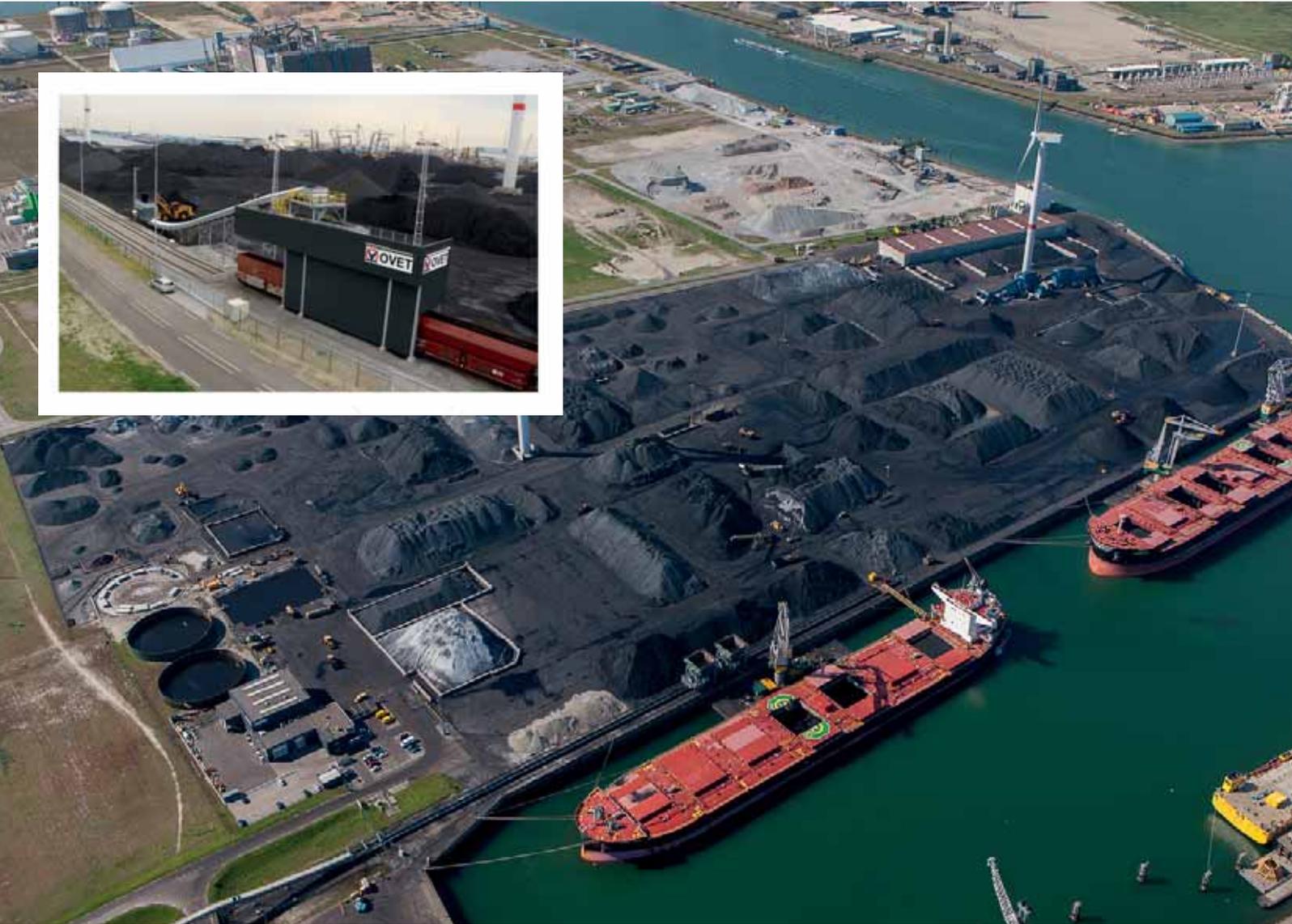
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Jay Venter

Bulk possibilities at the Port of Dunkirk

Dunkirk is historically an industrial port, and is notably the location of one of ARCELOR's strategic sites. Because of this, bulk traffic has always been significant in the port, and now accounts for half the total volume.

2014: INCREASED TRAFFIC VOLUMES FOR THE PORT OF DUNKIRK

The total volume handled by the port of Dunkirk in 2014 was 47.10mt (million tonnes). This was an excellent result for France's third-largest port, an increase of 8% compared with the previous year. At 23.6mt, generated essentially by the steel industry (ArcelorMittal), dry bulk was up by 9%.

PORT OF DUNKIRK: GEOGRAPHIC LOCATION AND HUB STATUS

Occupying 17km of coastline and a total area of 7,000 hectares, the port of Dunkirk can offer solutions adapted to all types of bulk traffic. And its strategic location, with direct access to the sea, means it can berth ships with draughts of up to 14.20m via the eastern entrance to the port and up to 18.50m via the western entrance.

Located on the North Sea, just 90 minutes' sailing time from the world's busiest seaway (600 ships every day) and with excellent accessibility for shipping, the port of Dunkirk wants to be a Gateway Port, a redistribution platform for bulk cargoes and short-sea shipping. The port has demonstrated its know-how in the handling of solid bulks, and this position must be reinforced and exploited by accommodating the world's largest bulk carriers and developing transshipment activities.

LAND RESERVES: IDEAL LOCATION FOR BUSINESSES INSTALLED IN THE PORT OF DUNKIRK

Dunkirk is one of the only ports that has large land reserves:

3,000 hectares out of the total occupied area of 7,000. This means it can easily satisfy businesses seeking a strategically-positioned site, very close to the sea and with road and rail links. What is more, the port of Dunkirk, as France's foremost rail freight hub, is covered by a 250km network of railway lines. This proactive policy is fully in line with the national ports strategy for the development of logistics and consolidated overland transport for large volumes.

With all this, any company that decides to set up here is assured of excellent maritime links and an easily accessible hinterland.

SOLID BULK OPERATORS AT DUNKIRK

Besides these setup possibilities, the port of Dunkirk is home to a number of operators capable of handling and storage:

DMT (Dunkerque Multibulk Terminal) – situated in Dunkirk's Eastern Harbour

With its covered storage areas, some of them wharfside, DMT offers a complete solution of discharging and reloading ships and barges or trains for all types of small bulk cargoes. In particular they are specialized in the handling of powdered goods and have specific equipment for this.

The quay and storage yard extension was commissioned at the beginning of 2013. The maritime quay and the waterway berth provide access for ships and barges and allow high throughputs at loading and discharge. A further 15,000m² of wharfside storage yards means DMT can provide new, competitive logistics solutions.

With private railway sidings, weighbridges and a train intake pit, DMT offers a reception and shipment rate of 300 tonnes per hour for agricultural products. The facilities also include truck



Photo: Jean-Louis BURNOD / HAPPYDAY

loading and unloading stations and road weighbridges.

Another of DMT's strengths is its 65,000m² of total available storage capacity, 55,000m² of which is designed for the storage of fertilizer and other ores (magnolite, clinker, gypsum, etc). DMT can offer customized solutions such as bagging services.

SEABULK (subsidiary of the SEA-INVEST Group)

Present in dozens of terminals in France, Belgium, the Netherlands, Poland and Ivory Coast, SEABULK is one of the leading operators on the dry bulk handling market.

At Dunkirk, SEABULK not only handles small dry bulk traffic but is also one of the main operators in industrial heavy bulks.

Installed in the eastern, central and western parts of the port, SEABULK has multimodal terminals and efficient equipment for the handling of small dry bulks. With its facilities on terminals dedicated to the handling and storage of bulk goods, SEABULK is able (depending on the area of the port) to accommodate ships with draughts of up to 14.20m.

Specializing in almost all types of dry bulk, SEABULK is particularly active in the sector of fertilizer, agricultural bulks, bauxite, lime, scrap metal, etc, and also offers its clients large areas of open storage and possibilities of covered storage.

SEABULK is also a major operator of the port of Dunkirk in the field of industrial heavy bulks. Having its facilities in the western part of the port (with direct access to the sea), the terminal boasts 200,000m² of storage space and can accommodate ships with draughts of up to 18.50m. Its 650

metres of quayside allow two Capesize ships to berth simultaneously.

EFD – Entrepôts Fluviaux de Dunkerque

Based at Loon Plage, EFD is situated within the inland port and is able to handle all types of product, regardless of packaging method.

With railway and canal branch lines, the EFD platform can carry out direct transshipment or transfer to storage yard, and offer its clients open or covered storage facilities.

NORD CEREALES

Supported by the ambitious investment policy of Nord Céréales, the port of Dunkirk has beaten record after record in grain exports. This development coincides with the return of the rail mode on this market.

These excellent results are due to the drive of the operator who has improved productivity through significant investments, making it possible to berth and load very large-size ships (14.20m draught) with high throughputs.

The growth of grain export volumes is also boosted by a reorganization of land-based logistics. Alongside waterway transport, which accounts for 52% of supply, the rail mode is again being used after a gap of ten years, enlarging Dunkirk's hinterland towards eastern France.

Nord Céréales offers vertical and horizontal storage capacities of 330,000 tonnes in the port of Dunkirk.

THE FRENCH PORT FOR DRY BULK



Bureau Veritas: bulk carriers behemoth



Richardais (40,000dwt) built by Tianjin Xingang Shipbuilding Heavy Industry for LDA Roullier.

By Konstantinos Chatzitoliou, Business Development Manager, Bulk Carriers, Bureau Veritas

Bureau Veritas (BV) is a classification society responsible for the assessment of ships' conformity with specific sets of rules developed in-house and also according to standards developed by the International Maritime Organization, the Flag Administrations and other International bodies. Through our activities, we contribute to global maritime safety and help protect the marine environment. BV is active in the classification of all types of ships and maintains a leading position in the bulk carrier sector. It has contributed actively in the safety improvement of bulk carriers which endure a very demanding service life while at sea and in port.

Today the BV fleet stands at 11,270 ships with an aggregate tonnage of approximately 109m GT. The average age of the fleet is 13.2 years. 37.6% of the tonnage corresponds to bulk carriers making this market segment the strongest tonnage contributor for BV. The 1,067 bulk carriers in Class represent also the youngest ships in the fleet with an average age of just below eight years. In the past four years we are witnessing a decrease in the average age of BV's bulk carrier fleet which can be attributed to the increased inflow of new vessels and the exit of older ones mainly for scrap.

BV's bulk carrier fleet represents more than 10% in both tonnage terms and number of ships of the global dry bulk fleet, which is responsible for the transportation of more than one-third of all international seaborne trade.

The existing world bulker fleet comprises mainly of smaller vessels below 65,000dwt. This can be attributed to the fact that these ships are usually geared and ideally suited to loading/unloading operations in ports with limited infrastructure. Nonetheless, the world tonnage growth rate is increasing faster than the number of ships which points to the fact that the average vessel size is getting bigger due to economies of scale. In 2011 the average ship size would be around 65,000dwt and today is above 73,000dwt. This size increase is not triggered by the preference of ship owners only for the largest bulk carriers for example Capes, Newcastlemaxes or even Very Large Ore Carriers but that they choose the largest vessels in each size category. So, a few years back, the preferable Handymax bulker would be a 57,000dwt Supramax while today is the 64k dwt

Ultramax. We also don't see a wide range of Handysizes anymore and the main size in the orderbook is close to 40,000dwt.

The world bulk carrier orderbook stands today at 133m dwt and approximately 1,600 vessels which is in the low 16% of the fleet. This represents a healthier orderbook to fleet ratio compared to the past which steadily hovered above 20%. BV's orderbook stands at 110 vessels corresponding to 10m dwt. Forty-four of these vessels are Ultramaxs in the range of 63,000dwt and a large number of Newcastlemaxes of 208,000dwt, all currently under construction in China. BV maintains a leading position in China having supervised the construction of almost 1,200 bulk carriers there.

The main objective of BV in the classification of bulk carriers is to ensure that they are designed and built to the highest safety standards and are also surveyed prudently while in operation.

During the design and construction of each bulk carrier, BV makes sure that all of its structural elements are examined for their capacity to withstand the local loads of the sea and the carried cargo and also the global loads which result from the overall bending of the ship while at sea. Today, this examination is performed with state of the art 3D finite element analysis software called HOMER which has been developed internally. The examination takes into account the worst waves that the vessel will encounter in its service life.

With the aim of increasing bulk carrier safety the new Harmonised Common Structural (H-CSR) rules became mandatory in July 2015. BV had a leading role in the development of the H-CSR due to extensive experience from its large bulk carrier fleet and also its advanced software. BV



Wolverine (61,292dwt) built by Nantong Cosco Khi Ship Engineering for Starbulk.

Kypros Bravery (78,000dwt) built by Sasebo Heavy Industries for Safety Management Overseas.



Western Panama (24,868dwt) built by Jiangmen Nanyang Ship Engineering Co for Nisshin.



headed one of the most important domains of the new rules regarding wave loading and buckling assessment. A thorough seakeeping analysis for a large number of modern bulk carriers revealed the need to include the examination of the vessels' structure under quartering seas in order to accurately account for torsional effects that are becoming more important for large ships. The new rules also introduced accidental case scenarios that safeguard the ship's survival after a collision or grounding.

All rules aim at improving the safety of the ship and have been derived from careful risk analysis studies and of course

from operational feedback. Nonetheless, real life sometimes proves that not all risk scenarios can be anticipated. BV's emergency response service provides immediate support in case of accidents with specialized reviews for the assessment of the residual strength and the stability of the vessel. In addition, expert surveyors board the ship in order to assess the damage and its possible effect in the surrounding structure.

All in all, Bureau Veritas is proud to deliver the highest level of safety services for its bulk carriers which are currently operating worldwide under its class.

Interesting 2014/2015 season for HAROPA

Dry bulk from HAROPA ports totalled 12.4mt (million tonnes) in 2014, against 14mt in 2013. This decrease is due in particular to the economic situation.

At the end of September 2015, total volumes for dry bulk reach 9.7mt (+4.3%).

Grain: a good campaign. Exports from HAROPA – Port of Rouen totalled 7.61mt on the whole 2014/2015 season. This figure is an increase of 2.4% compared with the 2013/2014 season and 14% compared with the 2012/2013 season; it is the second-best total in the past 15 years of export. The 2014/2015 season marks the fourth consecutive rise in shipments from HAROPA – Port of Rouen and strengthens its position as a major grain hub in France and in Europe, even in a complicated season due to the bad weather conditions.

The 2014/2015 season appears as an atypical season for Rouen for several reasons:

- ❖ barley traffic (1.85mt) is the highest since the 1998/1999 season; 80% of this tonnage is made of malt and feed barley shipments to China;
- ❖ if the traditional destinations of Rouen remain among the first on the export season, HAROPA notes many diverse destinations especially as regards feed wheat shipments. To be noted:
 - South-East Asia destinations (Philippines, Bangladesh, Thailand and South Korea) totalled 0.86mt, which is a major first for Rouen
 - Mexico and the United States are among the unusual destinations this year; and
- ❖ the high number of Panamax and Overpanamax vessels – 69 in total – which called at Rouen grain terminals: this record proves the ability of the silos to process this type of vessels and reinforces HAROPA – Port of Rouen in its draught improvement programme.

The new grain season (2015/2016) is in line with the former one in the Port of Rouen, as at 15 October there were already 2.11mt loaded, which represents an increase of +18% on the same period last year. Main destinations are China (malting and feed barley) and Algeria (milling wheat).

This year's French crop is very good in quantity and quality; however competition with other exporting countries is tough and the diversity of destinations is not the same as last year.

PORT & TERMINAL DEVELOPMENTS / UPGRADES / EXPANSIONS

The 2014/2015 season prepares for Rouen's future with the continuation of the access channel's improvement works, investments which improve Rouen silos competitiveness (river unloading at Socomac silo, new maritime loading equipment at Simarex, river unloading and other investments at Sénalia, dust reduction system and drainage network at Lecureur) and the announcement of the construction of the new port silo of the Beuzelin company.

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 offering (linking 600 ports worldwide). It serves a vast hinterland whose core 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.

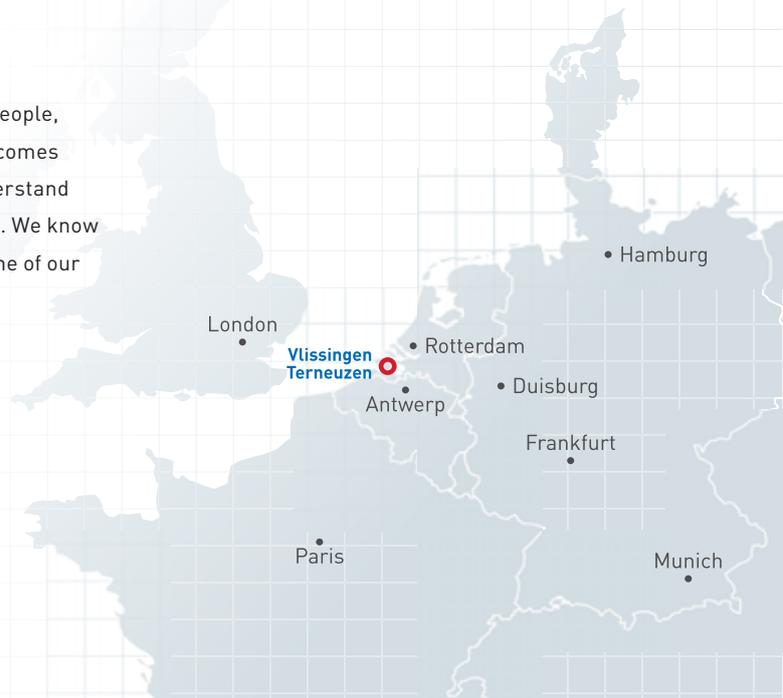
HAROPA handles over 120 million tonnes of cargo by sea and waterway each year. HAROPA business represents 160,000 jobs.

It's in our character



The port is our life. Hands-on mentality, hard work and accessible people, that's our character. Anyone who gets to know Zeeland Seaports becomes acquainted with professionals who are proud of their ports. We understand that your interests are also our interests. Clients come first. Always. We know what's important to your company. That's all in our character, and one of our many strengths:

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driven by dedication



Agena Tramp – headquartered in Le Havre, active worldwide



From its origins as a local company in 1972, the French company Agena Tramp grew to be one of the leading ship agency and marine services providers in France.

Agena Tramp, headquartered in Le Havre, France, is dedicated to ship agency and marine services. Its dry bulk activity consists in co-ordinating and facilitating incoming and outgoing bulk shipments for transportation companies.

The company started to operate in the ports of Le Havre, Rouen and Bordeaux in France, before becoming successful and extending to other French ports. Agena Tramp is, now, one of the first ship agencies to ensure the best ports coverage in France with 9 owned offices covering main & secondary French ports from the North, the Atlantic Coast and Mediterranean: Dunkerque, Le Havre, Rouen, Brest, Montoir, La Pallice, Bordeaux, Marseilles and Fos.

In addition to port agency, Agena Tramp offers a wide range of relating services such as:



- ❖ crew change;
- ❖ dry-dock and repair supervision;
- ❖ husbandry services;
- ❖ offshore support;
- ❖ port information;
- ❖ project cargo and any handling;
- ❖ protective agent;
- ❖ ship agent;
- ❖ ship supply;
- ❖ spare parts delivery; and
- ❖ stevedoring.

The company philosophy is to serve the shipping industry through dedication, professionalism, independence, loyalty, expertise and a code of ethics.

Agena Tramp is an affiliate of NAXCO Group, one of the largest fully integrated shipping and logistics providers. The French private group, founded in 1967, is a leading and innovative global partner, present in all segments of the transport and logistics worldwide. NAXCO Group is composed of 24 affiliates and 450 employees, all active in shipping, forwarding and logistics, NVOCC and Marine services.

TRADE VOLUMES & PATTERNS

About 60% of Agena Tramp's business relates to dry bulk activity. Since its establishment, the company has always put dry bulk at the forefront of its strategy.

Its own offices and employees in Bordeaux, La Pallice, Montoir and Dunkerque ports are the bulk key drivers, in addition to the others activities. Dry bulk is a demanding market requiring further work: bulk carriers spend more time in port than other ships, more players are needed in the field, significant material handling experience is requested.

The company can handle all types of materials and is largely involved in wheat, iron ore, sunflower pellets, soybean meal pellets and coal. Sunflower pellets come mainly from Black Sea (Ukraine), soybean meal pellets from Brazil and Argentina, and iron from Brazil and Australia. Wheat is exported to North Africa (Algeria, Morocco, Tunisia, and Egypt) and coal to Australia.

The remaining 40% of Agena Tramp business is shared between Liner and cruise, liquid and heavy lift/project cargoes.

TECHNOLOGICAL ADVANCEMENTS

Agena Tramp remains at the cutting edge of technology and has invested in a global IT system to deliver a high level of service performance. The company's priority is to offer complete solutions to customers for the carriage of cargo.

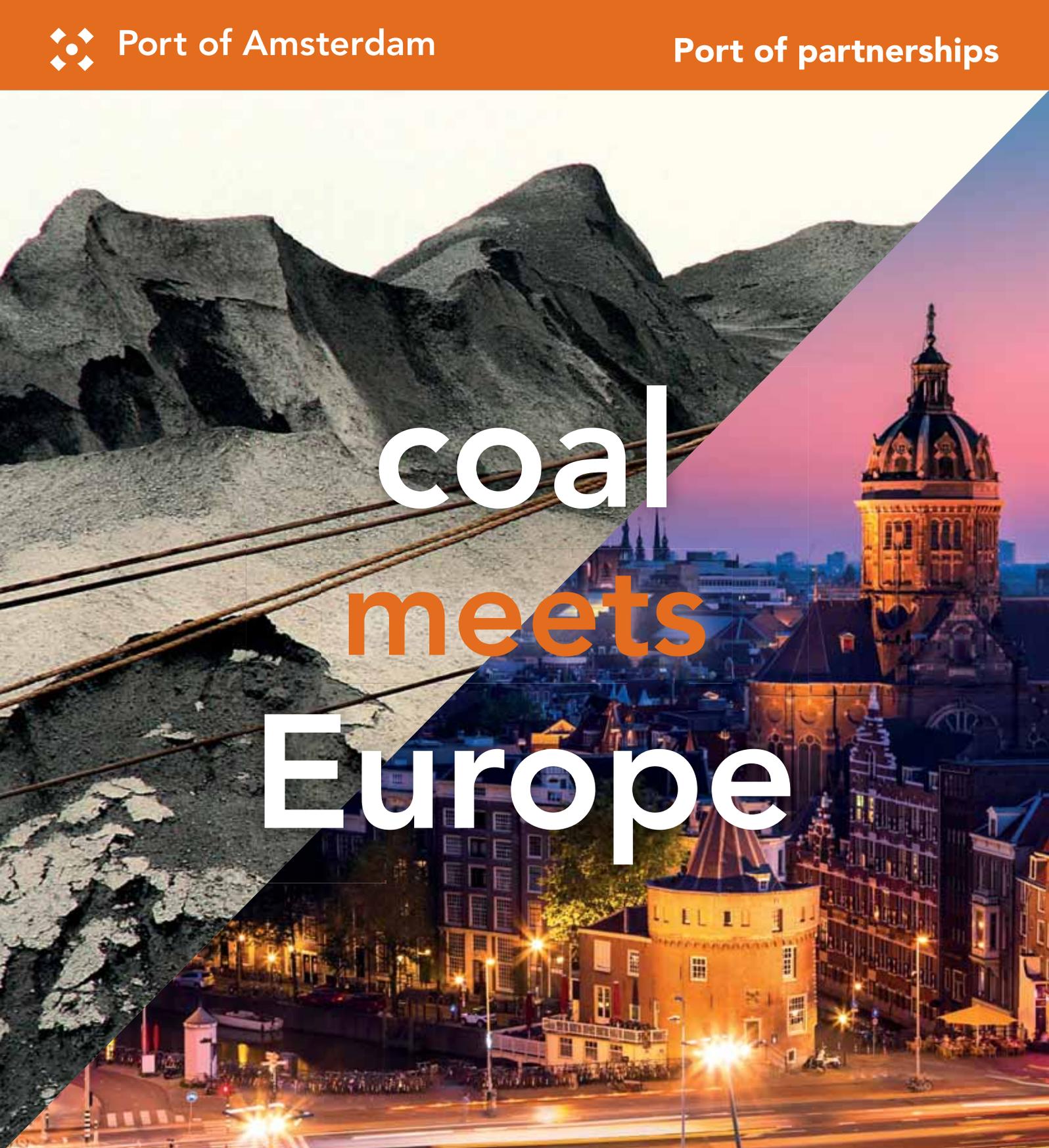
PORT & TERMINAL EXPANSION

Agena Tramp ship agency and marine services cover a wide range of countries via its own network:

- ❖ Europe: France and Belgium;
- ❖ North Africa: Morocco, Algeria, Tunisia and Egypt;
- ❖ West Africa: Senegal, Ivory Coast, Ghana, Togo, Benin and Nigeria;
- ❖ South-East Asia: Thailand and Myanmar; and
- ❖ Caribbean: The French West Indies.

The company's future plans is the expansion of its worldwide partners' network in order to be a key shipping agent for global accounts and multinational companies.

Agena Tramp continues to pursue value-creating opportunities, to develop and strengthen its dry bulk activity.



coal meets Europe

Welcome to the port of Amsterdam. Where coal meets Europe. As Europe's second-largest coal port, Amsterdam is a leading player within the business. The existing large and flexible terminals - offering custom made solutions - attract a substantial share of Europe's need for 'import coal'. And the demand is rising. The port of Amsterdam is ready to accommodate this market growth and has the ambition to do so in a sustainable manner. Amsterdam has a unique logistic location within the world's largest energy hub: the ARA range (Amsterdam, Rotterdam, Antwerp). Situated in

Europe's largest delta the port of Amsterdam offers a dynamic international hub with a sea-entrance-draft up to 17.8 meters and excellent hinterland connections for inland shipping, rail and road. All together an excellent location for your coal business.

Want to know more about the port of Amsterdam where coal meets Europe?
Go to www.portofamsterdam.com or contact our Commercial Division, Cluster Energy directly via femke.breninkmeijer@portofamsterdam.nl

LDPL awarded contract for transshipment and port operations of Hassyan clean coal power plant project in Dubai

LD Ports & Logistics has been selected to manage the coal handling and transshipment facilities to supply the Hassyan clean coal power project in Dubai.

LDPL has worked closely with ACWA Power and Harbin Electric consortium to develop and propose an environmentally friendly transshipment solution for Hassyan clean coal power plant project. This ultra-supercritical plant is the first coal-based power plant in the Middle East and is designed to be a 'best in class' plant in terms of efficiency, output and adherence to global environmental best practices.

The consortium has been selected by Dubai Electricity and Water Authority (DEWA) as the preferred bidder for the first phase of the 1,200MW Hassyan clean coal power project. The consortium bid a levelized cost of electricity (LCOE) of 4.501 cents/KWh based on May 2015 coal prices. The plant will start commercial operation by March 2021 with a net output of 1,200MW, representing a 12.5% boost of the Dubai current grid capacity.

"We are delighted to have been selected as preferred bidder for this major project which demonstrates the strength of the company's technical capabilities and capacity to offer reliable, performing and environmentally friendly transshipment and port operations at a competitive price," said Emmanuel Dur, Managing Director of Louis Dreyfus Armateurs ports & logistics division. "LDPL's competencies in Engineering and Newbuildings as well as the project team's expertise will ensure the project is managed in an exemplary manner. We are enthusiastic to continue supporting Dubai ambitions in providing electricity and water services according to the highest international reliability and availability standards".

The transshipment solution will consist in Floating Crane Transshipper Units (FCTUs) and highly manoeuvrable shallow draft self-propelled barges that have been specifically designed to meet the environment and natural restrictions of Hassyan project. FCTUs and self-propelled barges will be used to unload Capesize vessels and deliver coal at daily rate exceeding 36,000 metric tonnes per day. The coal-fired power plant will produce sufficient electricity to power nearly 250,000 households in Dubai.

DEVELOPING ENVIRONMENTALLY FRIENDLY TRANSSHIPMENT SOLUTIONS

The sensitivity with respect to limitation of dust emission for Hassyan clean coal project has motivated LD Ports & Logistics to use systems for controlling and suppressing airborne dust emission during coal handling operations. Regarding barging operations, LDPL will use specific barges, especially designed for this project. They are equipped with their own dust suppression systems.

Dust and coal particles will be contained inside the cargo

Fazel barge design for Hassyan Clean Coal Project.



compartment by use of an atomized water screen. This protection curtain covers the whole lengths and both sides of the coal compartment, ensuring an optimal and permanent protection during transshipment, transportation and unloading of barge. Dust emission is therefore fully contained within the cargo space thanks to the steel cover structure and the high pressure atomized fresh water barrier. Each barge generates its own fresh water reserve through reverse osmosis process. The cargo space is fitted with a water drainage collection and treatment system on board to recover the coal dust.

RESEARCH AND DEVELOPMENT IN FRANCE

LD Ports and Logistics focus on offering a one-stop solution, from the mining site to the end users with an expertise that covers the entire maritime value chain.

Being a specialized branch of Louis Dreyfus Amateurs, established in France, LDPL can count on highly-skilled engineers, graduated from the France top 'Grandes Ecoles' to address their client's challenges. France is well known the world over as an attractive place to do research and development. LDPL benefits from this entrepreneurial culture and strong sense of innovation to steer their way to success and deliver high value added solutions. The French engineers enjoy an excellent reputation. Some of LDPL's most critical innovations, like BATOS, Barging and Transshipment Optimization software has been developed in cooperation with the top university for science and research in Paris. This is why there are numerous good reasons for doing research and develops innovations in France.

The engineering and professional capabilities of LDPL's team enables to address maritime challenges with confidence and designing barging and transshipment solutions perfectly adapted to the constrains of each project.

LDPL bring barge optimized loading schemes into focus: these aim at loading barges with optimum cargo quantities and following the appropriate loading sequence so that a safe under keel clearance can be maintained at any moment of the tide, while maximizing the cargo intake.

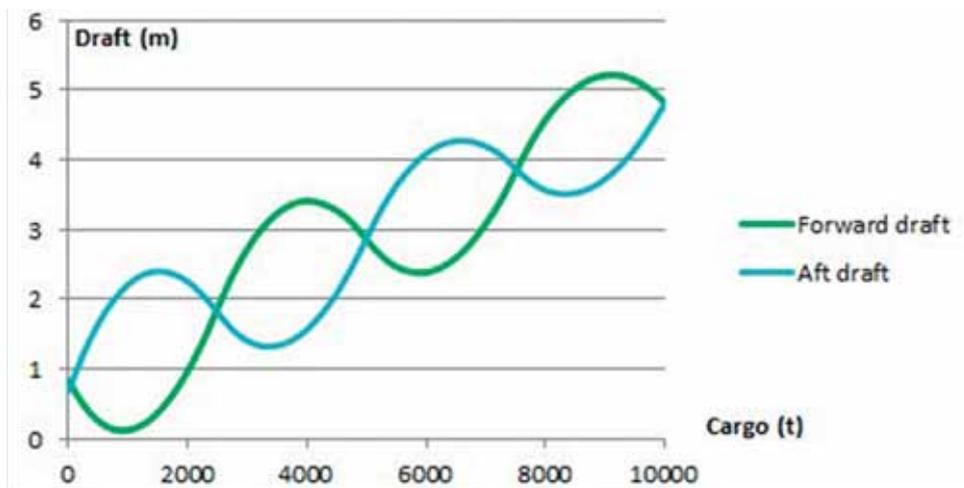
An advanced model calculates draft variation due to trim

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time at the critical zone and thus to design the most suitable solution.

From an operational point of view, in order to further optimize the transshipment and export, LDPL has developed a tool for an optimum interaction between transshipment and shipping operations. The shipping plan can make a provision to position ocean-going vessels laycans when operational conditions (tides, waves, wind...) are favourable, so as to maximize the probability to have an OGV arriving at the best

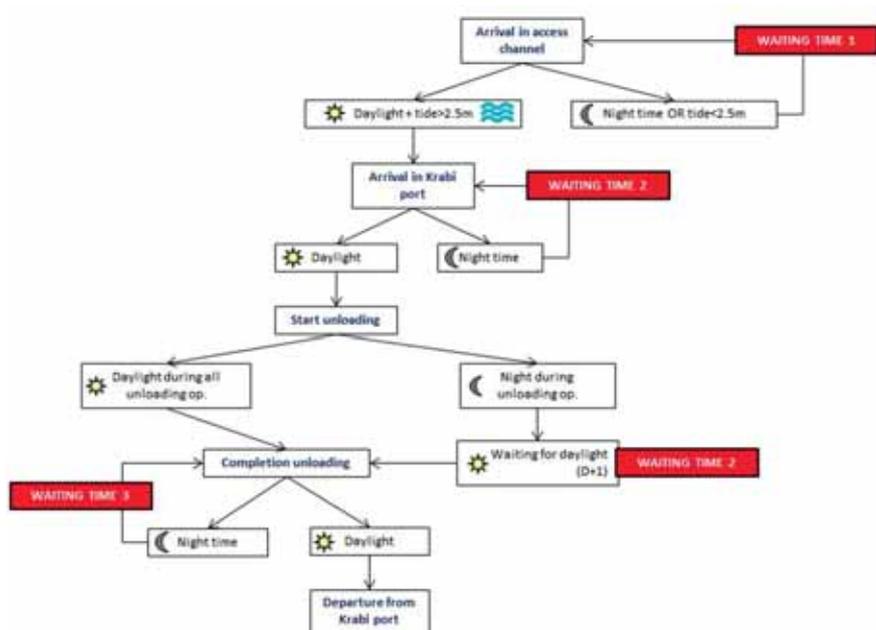
motions for different tide and wave scenarios. This barge loading simulation determines the trim allowance needed, depending on the type of loader used (travelling, fixed, rotating chute etc.), water level variation and number of loading passes. Such studies are critical to identifying the most efficient barge loading facilities. The model also points out the exerted bending moments and shearing forces. A comprehensive barge trimming and stability calculation is eventually performed to ensure that barge can be loaded and depart without any risk of grounding.

Furthermore, by controlling the trim of barges and along with an analysis of the tidal variation during all the loading progress – for different types of tides, LD Ports & Logistics can make the most of the water depth available: cargo intake will always be optimized. The benefit of loading more when possible is to increase the export capacity while reducing the fuel consumption. Moreover, by limiting the number of rotations and time spent for manoeuvres, it increases the transshipment rate which lead to generates savings on the long haul ocean freight.

Accessing a channel or a loading berth sometimes faces restrictions such as waiting for adequate tidal amplitude or waiting for specific hours during the day. For such projects, LDPL uses an *ad-hoc* program to evaluate the risk of waiting

moment possible.

LDPL bases most of its analysis on a Monte Carlo simulation process, computing meaningful indicators over thousands of scenarios tested in order to accurately measure risks. LDPL can



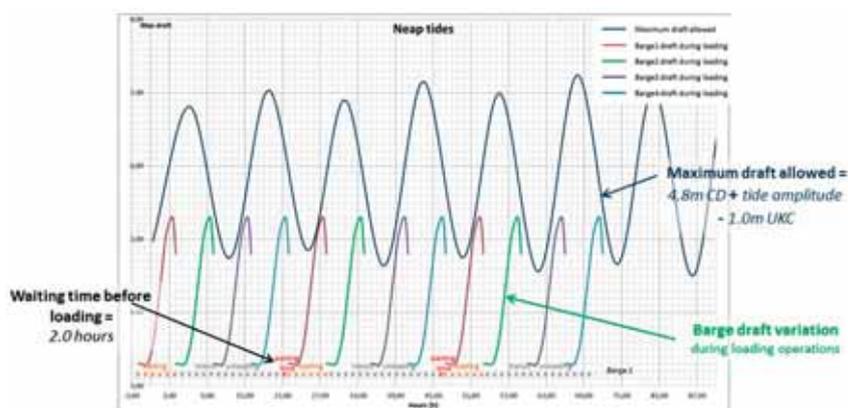
evaluate risk of congestion and demurrage at the terminal simulating ocean-going vessels arrivals and integrating the laycan schedule and the shipping plan.

COMPANY PROFILE

LD Ports & Logistics is part of Louis Dreyfus Armateurs group, a French family business founded in 1851 which has continuously been a leader in the field of maritime bulk transportation and logistics.

LDPL is the specialized subsidiary focusing on Mining sector and Energy industry, proposing a wide range of integrated services in floating terminal and transportations, forging long-term partnerships with leading industrial groups around the world.

LDPL has also acquired extensive experience in the development of shallow water solutions in order to “feed” their floating terminals.



SDV to build logistics hub at Port of Le Havre

SDV Logistique Internationale, a subsidiary of Bolloré Logistics, one of the top ten leading global transport and logistics groups, and HAROPA recently signed a preliminary agreement for the construction of a warehouse on the Parc Logistique du Pont de Normandie 2 (PLPN2) platform at the Port of Le Havre in France.

This project is divided into two successive construction stages: the first stage involves a surface area of 24,000m², followed by an additional 12,000m² for the second stage. At completion, SDV, which already operates several warehouses in the PLPN1 zone, will benefit from a total surface area of 75,000m² for its transport and logistics activities at the Port of Le Havre. Delivery of the building is forecast for October 2016.

“This new project is an integral part of our growth strategy for major global hubs. We are rolling out innovative and efficient logistics tools within these hubs, which are in line with the latest quality standards. The strengthening of our positions in the main international trading hubs, along with a competitive services offering, enables us to attract greater flows and manage the logistics and supply chain activities of our customers. Other major projects are currently underway in France and abroad,” said Thierry Ehrenbogen, Chairman of SDV Logistique Internationale.

‘SDV, AN EXEMPLARY PRESENCE’

“We welcome the signing of this preliminary agreement which underlines our determination to facilitate the availability of land according to our customers' schedules” stated Hervé Martel, Vice-Chairman of HAROPA. “HAROPA is today proud to welcome the Bolloré Group and support its growth in the field. The presence of SDV Logistique Internationale at PLPN2 and also the whole length of the Seine, and in particular at the Port of Rouen, is exemplary in terms of job creation and value added as well as the close relationships that the company has with international transportation operators”, added the CEO of HAROPA – Port of Le Havre.

SDV is proud to announce this expansion programme. Based at PLPN1 at the Port of Le Havre since 2001, it was one of the first private logistics providers to open operations in the zone. According to Henri Le Gouis, SDV CEO of the Western Europe area, “this new warehouse represents a total investment of €30 million. It further underlines our commitment to supporting the growth of the Port of Le Havre, by positioning ourselves as one of the leading international logistics players present at the PLPN2 platform”.

A NEW REEFER OFFERING OF 5,000M²

In a bid to stay abreast of market changes and its customers' need, the PLPN2 warehouse will provide ‘dry’ goods storage.



From left to right Hervé MARTEL, CEO of HAROPA – Port of Le Havre and Thierry EHRENBÖGEN, Chairman of SDV Logistique Internationale.

This will allow SDV to vacate and develop a large 5,000m² area solely dedicated to Reefer logistics in the PLPN1 zone.

With France preparing to host the 21st UN Climate Change Conference, environmental issues are more pertinent than ever for the Bolloré Group. The future warehouse, which will be located right next to the new multi-modal terminal at Le Havre, will be certified LEED®v4 and BiodiverCity®.

ABOUT SDV LOGISTIQUE INTERNATIONALE

SDV Logistique Internationale is a brand of the Bolloré Transport & Logistics department, a major player in its sector of activity — N°1 in France and Africa, N°5 in Europe — and is present on all continents with 36,000 employees based in 102 countries.

SDV has a leading position in France and is one of HAROPA's largest customers along the length of the Seine. It is already well established in Rouen as well as in Paris and Le Havre.

ABOUT HAROPA – PORT OF LE HAVRE

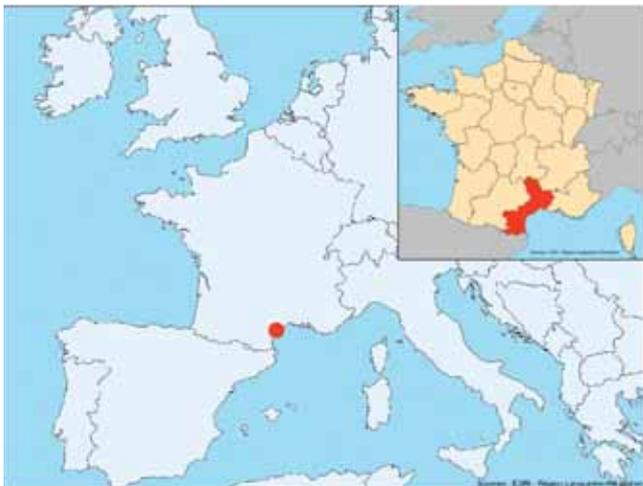
The Port of Le Havre is the leading container port for French foreign trade; one of the main focuses of its 2014–2019 strategic plan is logistics. The port has three logistics parks under development: PLPN1 (construction potential of 70,000m² of warehouse space), PLPN2 (committed protocols for the development of 168,000m², of which 36,000m² with SDV) and PLPN3 (potential to house around 175,000m² of warehouse space).

ABOUT HAROPA

As part of the HAROPA consortium, the three ports along the Seine route (Rouen, Paris and Le Havre), which together form the number five European port complex, own close to 1,000 hectares of land and land reserves. HAROPA supports its customers in the implementation and management of competitive and long-lasting logistics systems to serve the greater Paris region, the second largest European consumption basin, with its 25 million inhabitants.

Future Port of PORT-LA NOUVELLE (France)

PORT-LA NOUVELLE IN 2015



Port-La Nouvelle is the third-largest French port on the Mediterranean coast. Owned by the Languedoc-Roussillon Regional Government Council since 2007, the port is managed by the Chamber of Commerce of Narbonne. Regular investments have allowed complete diversification of the activities. The port manages the import and export of all kinds of goods including petroleum products, various liquids, cereals, agricultural products, dry bulk commodities, general cargoes and heavy lifts. The annual traffic is two million tonnes. Over the years, Port-la-Nouvelle has built a solid reputation for reliability. The port ranks No. 2 of the French Mediterranean ports for petroleum products imports and No. 1 for durum wheat exports.

FUTURE PORT

Due to the increasing traffic and anticipating the ever-increasing size of ships, the Port Authority has planned a deep sea port expansion with an initial



investment of over €325 million.

The port expansion will see the creation of a new outer harbour to accommodate larger ocean-going-vessels up to 225m length x 36m beam x 14.50m draught (dredging at minus 16m), corresponding to ships of about 80,000dwt for dry, even more for liquid cargoes.

The future port will propose investors 80 hectares of land plots available industrial sites and about 70ha of new terminals. The dry bulk terminals will have 2,000m of quays out of which 1,500 linear metre for vessels of 14.50m draught and the liquid terminal will be linked to four berths (14.50m draught still).

Shore side, the land plot for the future liquid terminal will be delivered in 2017. Sea side, the first infrastructures are expected to be delivered by 2020/2021. It consequently offers industrial accounts and terminal operators the necessary time to plan their projects; three years prior, breakwaters will be completed to receive the first vessels.

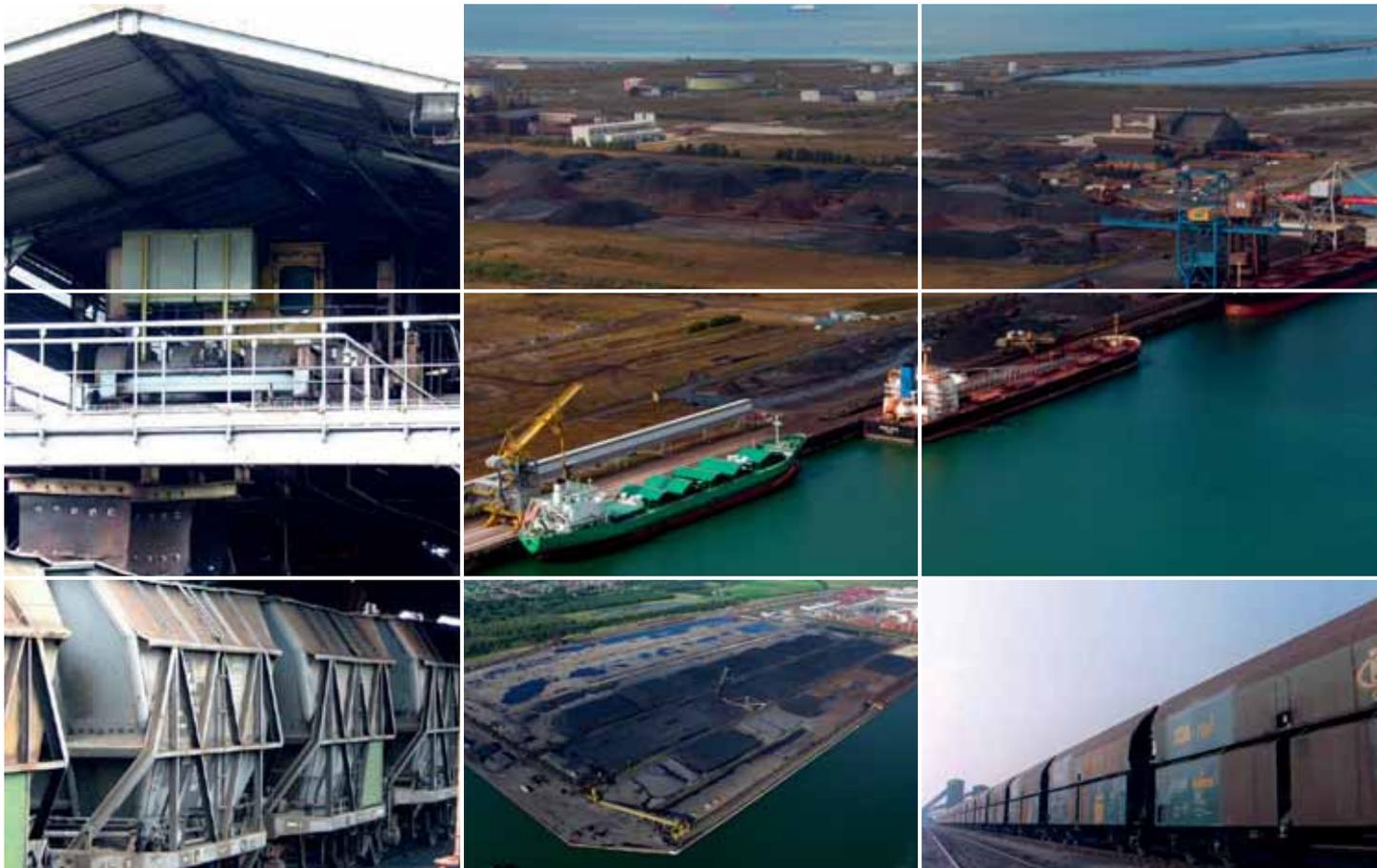
This new deep sea port will offer shippers and receivers new logistics opportunities in the South of France and Europe. The long-term aim of the future port is to develop traffic whilst attracting new projects and trades.

Port authorities are open to any projects proposed by international operators and now focus to strengthen the project with industrial groups who could invest in the port, plan industrial projects and create local jobs. Thanks to its new nautical conditions, the future port will be able to trade with new markets. Today Port-La Nouvelle only serves the Mediterranean Rim, Northern Europe and the West Coast Africa. In future, the Port will develop links with Asia, Indian Ocean and South America. The port will have better connections to international trades and will be more attractive for both existing and new customers.

Accordingly, the Languedoc-Roussillon Region intends to play a major role in the Mediterranean market. Commercial ports are structural elements of Regional territories and are therefore extremely attractive locations for economic development. Already, the Regional Council spends nearly 40% of its annual budget in regional transport infrastructures (ports, airports, railways and public transportation). Fourth French region for the rate of business creation, Languedoc-Roussillon, the population of which is expected to increase by over 20% by 2040, shows an ambitious and consistent investment policy that safeguards its future.



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Ports of Antwerp and Montreal renew collaboration

The ports of Antwerp in Belgium and Montreal in Canada have decided to renew their collaboration agreement for a further three years. The announcement was made jointly by both port authorities during the visit by Jean D'Amour, the Quebec minister for Transport and Implementation of Maritime Strategy. The renewal will be signed in 2016. The collaboration agreement was originally signed between Antwerp and Montreal, Quebec's largest port, in 2013. This agreement runs until the spring of 2016, but the parties have now decided to extend it for another three years.



Aerial view of the Port of Antwerp.

SIMILARITIES

It is hardly surprising that the two ports get on so well together, as there are many similarities between them. Both are located deep inland on a major river, and both serve a vast hinterland covering many provinces and indeed entire countries with huge purchasing power and major concentrations of industry. Furthermore, Canada as part of North America is one of the main 'foreland' partners of Antwerp. In 2014, the total volume of freight carried between Antwerp and Canada was 4.5 million tonnes. The upcoming implementation of the trade agreement

between the EU and Canada — the Canada-European Union Comprehensive Economic and Trade Agreement (CETA) due to be ratified in 2016 — should give a major boost to this trade in the next few years.

COLLABORATION

Since 2013 trade relations between the two regions have developed greatly. The first visit by a delegation from the port of Montreal followed soon after the initial signing of the agreement. The following year a delegation from Antwerp headed by port alderman Marc Van Peel travelled to Canada. Then at the beginning this year Philippe Couillard, Prime Minister of Quebec, paid a working visit to the port of Antwerp. And just before the summer Antwerp played host to another delegation from the port of Montreal.

MARITIME STRATEGY

A few weeks before the arrival of this last delegation Couillard presented Quebec's new Maritime Strategy during a speech in Montreal. The strategy is aimed at creating employment, facilitating transport and logistics and promoting sustainable development of industry. "Quebec is readier than ever to make its expertise, well developed infrastructure and huge, expanding economic market available to its European partners," declared Couillard on this occasion.

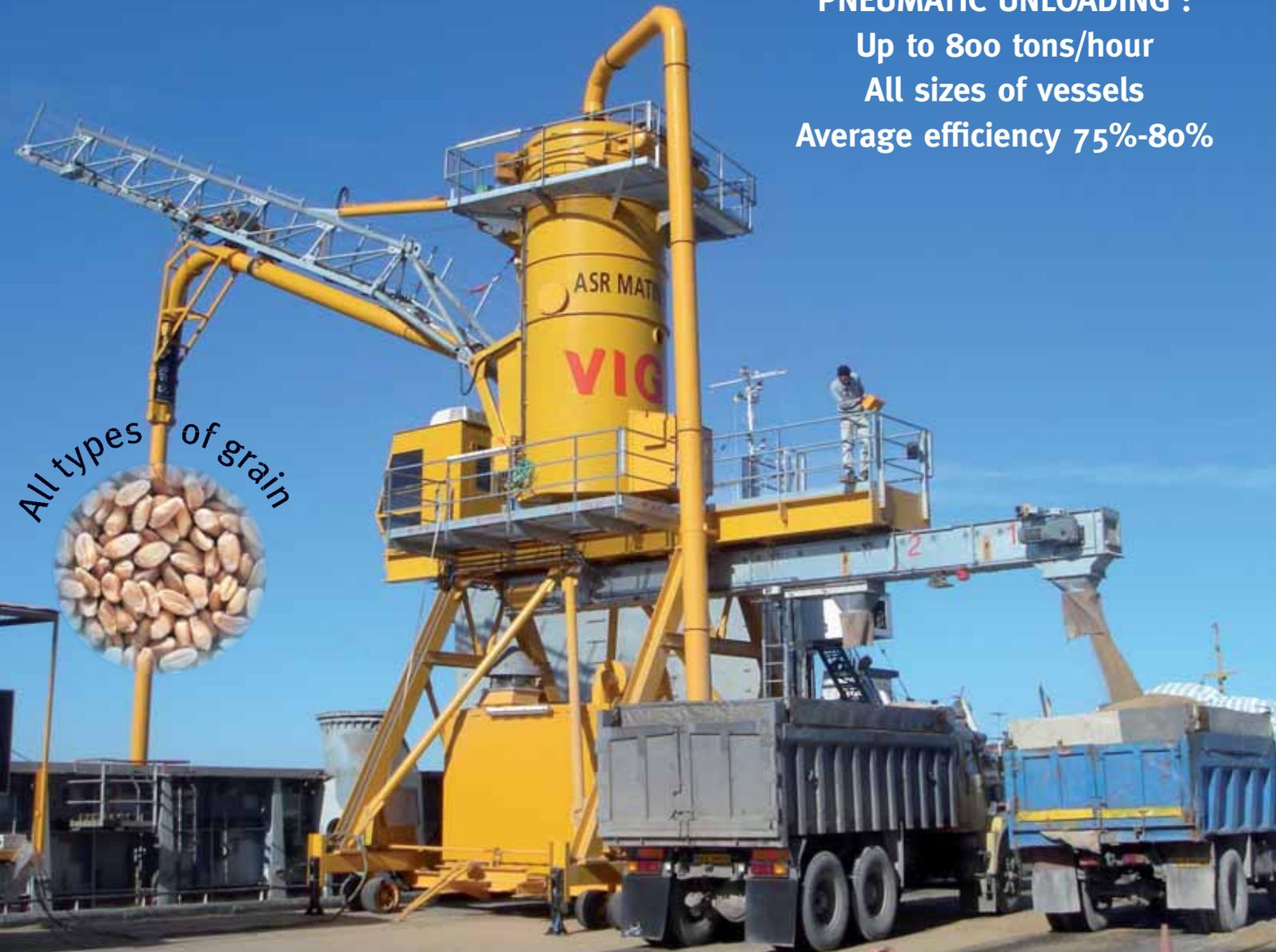


Bulk handling at the Port of Montreal.



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Van Moer Group presents new investment in port of Ghent

On Wednesday 30 September, the logistical service provider Van Moer Group gave the official go-ahead for its investment in the Port of Ghent. Ghent Port Company is elated that this logistics company is setting foot ashore for the first time in Ghent port.

In a storage space of 6,500m² ('Van Moer Ghent Warehouse') there is room for the storage of various goods in racks and at bulk locations, for fast transshipment ('cross-dock') and value-adding logistical activities such as repacking, labelling, filling and

repalletizing. The storage space is situated in the Skaldenpark industrial estate at the R4-East. This investment is good for 15 to 50 jobs.

Van Moer Group chose the Port of Ghent for these activities because of its good connections to France, the Netherlands and Germany by road (E17/E40) and via inland waters. The Port of Ghent is already active in the sector of value-adding logistical activities, storage and distribution. With this new investor, the port is strengthening its position.

CUSTOMERS RECEIVED IN GHEENT

Logistical service provider Van Moer Group is celebrating its 25th birthday this year. Van Moer Group and Ghent Port Company organized a customer event on 30 September, at the Port of Ghent's Visitors Centre. The Antwerp logistics company has drawn up a strategy for the coming years that focuses on further growth and diversification. For example, this new establishment in Ghent is in the pipeline and the chemicals sector is aimed at, among others.

ABOUT VAN MOER GROUP

In the course of 25 years, Van Moer Group transformed from a small family business into a completely integrated logistical service provider. The company has a turnover of almost €87 million and employs 560 people, of which 430 are in Belgium. It is active in Romania and Brazil.



Aerial view of the Ghent region, including the port.

Hansen Industrial Gearbox Services introduces complete spare parts packages

The service department of Hansen Industrial Transmissions nv (HIT) has introduced its 'All-in-One spare kits' in March this year. These kits contain all of the spare parts and accessories that are necessary to replace critical components in a gear unit, such as a shaft or a gearwheel.

When the requirement arises to replace a faulty shaft or a damaged gearwheel, users can obviously attempt to order the original spare parts. However, in addition to the shaft or the gearwheel, it is usually the case that bearings, seals, etc. also need to be replaced.

Consequently, the user's purchasing department will most likely have to contact several vendors to secure the various parts. From there, they have to request and



compare quotes, prepare orders and start up the internal logistics to ensure that everything is delivered in good time. This is quite a cost-intensive and time-intensive procedure. In the context of HIT's efforts at attaining sustainable partnerships, in which 'thinking together with the customer' is an underlying theme, it now offers ALL-in-ONE SPARES KITS. These complete spare parts packages are available for all of the HIT product ranges.

The benefits available to end users are countless. In particular, they will experience better control of the total cost of ownership of their installed drives and the total package price for their spare part(s) will be cheaper thanks to the 'all-in-one' and 'one-stop-shop' principles. In addition, the customer is guaranteed the correct parts (OEM certified original parts). This in turn will ensure an extension to the life of the drives as well as making traceability straightforward. Finally, the spare parts packages are also covered by the one year HIT guarantee terms.

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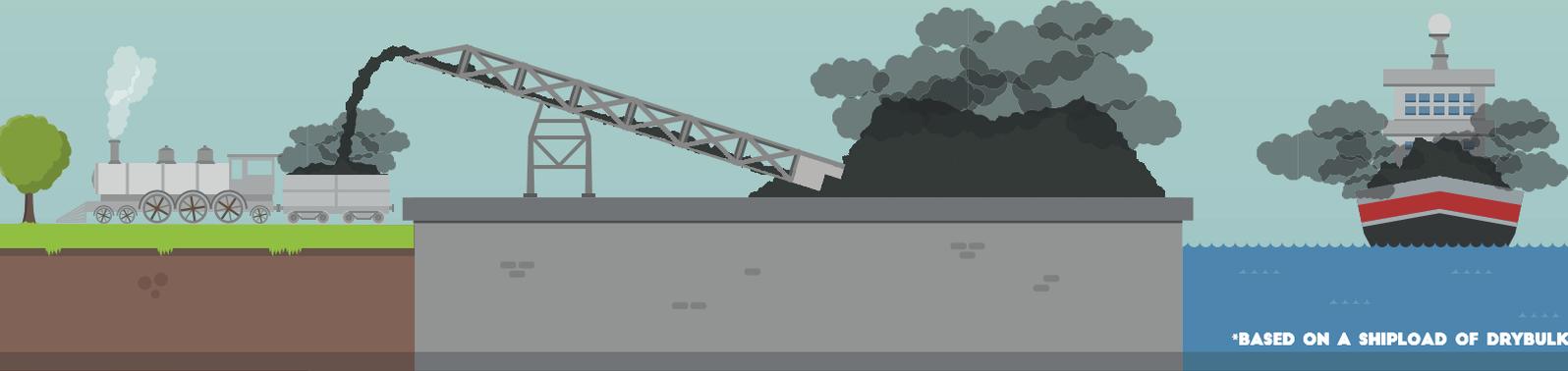
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Martin Engineering names new distributors in Africa

A global provider of high-performance bulk material handling technologies has named two new distributors of its complete line of conveyor components and flow aids, including belt cleaners, transfer point solutions, safety products and training, air cannons and field services. Martin Engineering RSA made the announcement as part of its ongoing commitment to deliver innovative products and technical support to the region's bulk handling applications in mining, quarrying, coal handling, cement manufacturing and other heavy industries. Alco Mining & Industrial Supplies and Vandlovu Mining & Industrial Supplies are sister companies that will both serve the Phalaborwa and surrounding areas, able to provide sales and support for the entire family of Martin Engineering products.

The move will broaden the availability of high-performance bulk material handling technologies in South Africa, helping customers improve the safety and performance of their operations, while minimizing lead times. "This agreement will help us strengthen our presence in South Africa and broaden our customer base in the key commercial regions," observed Chantelle Gakis (team manager in charge of distributors). "Alco and Vandlovu are among the few distributors capable of representing the Martin Engineering brand with the level of technical expertise we require to ensure outstanding product support and service."

Alco has been a driving force behind the growth of the mining industry in the Phalaborwa-Hoedspruit-Tzaneen triangle for more than two decades. The company was originally formed to supply air tools, lubricants and lubrication equipment to mines and mineral processing operations in the region, and quickly grew to become a leading independent distributor in the area, representing a comprehensive range of products manufactured by recognized leaders in their respective fields.

"Our philosophy is to add value to leading-edge products and provide a professional interface between the various dealer

The new distributors will handle the extensive family of Martin® conveyor components, such as belt support and sealing systems.



principles and the marketplace," observed JP van der Merwe. "An integral part of our role is to facilitate direct communication between manufacturers and end-users, to promote more effective technology transfer and faster resolution to problems."

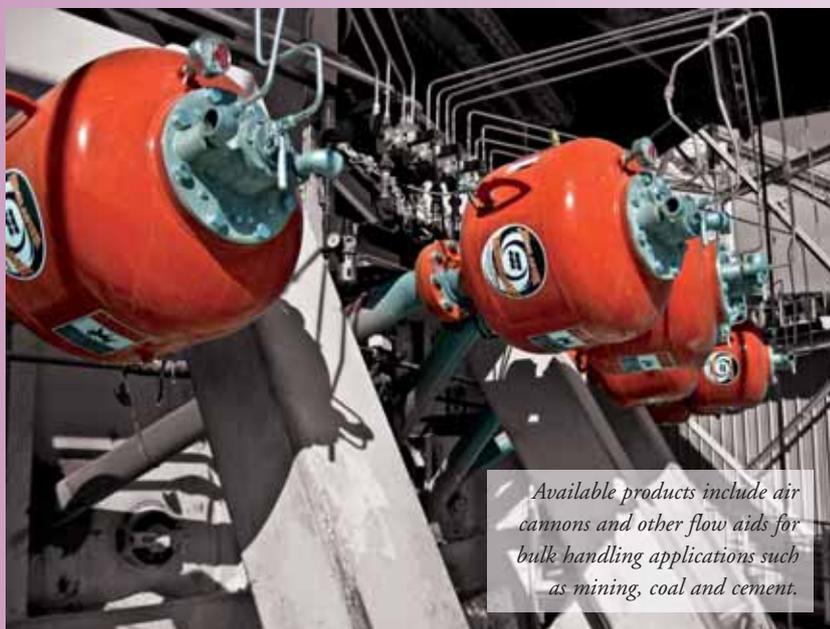
Vandlovu originated as a supplier of filters and lubricants, later adding hydraulic hoses and fittings to its portfolio of products and services. The company maintains a mobile hydraulic vehicle, outfitted to repair hydraulic systems on-site and available 24 hours a day, seven days a week to help customers reduce downtime and expenses.

Building on the strength of its experienced technicians and sales personnel, the firm purchased Alco in 2015 to further broaden its capabilities and customer base. "The partnership is working out very well," commented Johannes Seabela. "We measure our success by our ability to deliver workable solutions for a wide range of applications, serving customers in a broad range of industries. Based on our results so far, the team's shared dedication, ethics and customer service are proving to be key ingredients."

According to Gakis, a shared value system was one of the things that brought the firms together. "Alco and Vandlovu are both respected names throughout the region, recognized for their technical skills, business integrity and customer service. We felt confident that with their ability to facilitate good communication and foster positive customer relationships, they have the skills and the mindset to help us continue developing a strong presence here, earning customer recognition and loyalty. They have the ability to seamlessly integrate Martin Engineering products into customer operations, as well as the technical training to support them."

Since 1944, Martin Engineering has developed innovative products and services for bulk solids handling applications around the world. The company attributes its success to the design of field-proven, cost-effective solutions for "real-life" problems. Martin Engineering products are designed for tough industrial conditions, engineered for simplicity, safety and efficiency, and built to allow easy maintenance.

Available products include air cannons and other flow aids for bulk handling applications such as mining, coal and cement.



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New AUMUND belt bucket elevator for the vertical transport of coarse grained bulk material

During the last 60 years, AUMUND delivered more than 5,500 bucket elevators worldwide to all those industries where the vertical transport of bulk material is of importance. These are especially the cement, limestone, fertilizer, steel and mining industries. For those industries, AUMUND constructed belt and chain bucket elevators. The belt bucket elevator is configured for a grainage of ten millimeters and a performance of 2,000tph (tonnes per hour). The growing presence in the fields of mining and minerals led to the development of a coarse grain bucket elevator (BWG-GK type). It is able to transport coarse grained material (up to 80 millimetres) with a performance of 1,200m³/h.

In developing the new BWG-GK type, AUMUND relied on proven components of the existing types of bucket elevators: in doing so, AUMUND focuses on standardized drive units. To protect the belt from damage by the conveyed material, AUMUND took a new path.

With the tight, overlapping configuration of the buckets, the belt will be completely covered by the buckets. Thus, coarse material cannot be jammed between the backs of the buckets anymore. Simultaneously the outer edges of the belt will be protected. Even in case of a stoppage with filled buckets, no coarse material will be thrown behind the backs of the buckets. The safe attachment of the buckets, under consideration of the bucket conditions during scooping as well, is guaranteed by the design of the AUMUND steel cords with transversally running

AUMUND bucket elevator belt for the BWG-GK (graphic ©AUMUND).



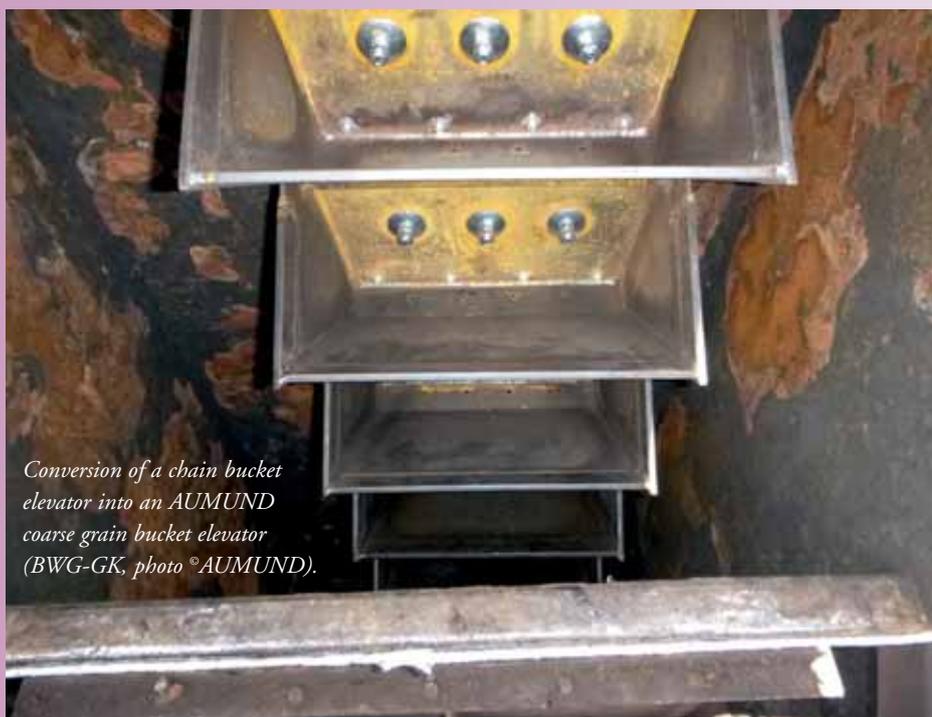
steel belt reinforcements. They provide a high pull out resistance and a reliable fixation.

The plate screws developed for mounting the buckets differ significantly from conventional DIN plate screws and are constructed for longer belt endurance and a higher load. Therefore, further parts to increase the tension force at the bucket attachment are not necessary. The belt runs without any problem or wear on the drive drum. Only little dead weight has to be transported. Beyond that, the belt of a bucket elevator has to guarantee a high tensile strength, little elongation and good directional stability. This will be achieved by a specialized production process and a high transverse rigidity.

The carcass design of the AUMUND bucket elevator belts combined with the AUMUND bucket attachment system guarantee a long lasting service life. The belt of the bucket elevator has been optimally designed for its attachments like buckets, profiled rubber edges and endless splices. Tightly packed cords made of high-tensile steel serve as tension members.

On the front and back side of the tension member, transversal steel belt reinforcements strengthen the belt. Contrary to reinforcements with textile mesh, the advantage of the transversal steel belt reinforcements lies with higher adhesion values between rubber and tension members. That ensures a durable connection of the particular belt layers even at higher temperatures.

Newly developed rubber compounds based on ethylene-propylene-diene-monomer (EPDM) make the use of AUMUND belt bucket elevators in ranges of operation with a material temperature of up to 150°C possible. Endurance tests during daily industrial routine have indicated that EPDM belts are more durable against ageing than textile belts.



Conversion of a chain bucket elevator into an AUMUND coarse grain bucket elevator (BWG-GK, photo ©AUMUND).

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Since 1972 Nectar has carried out operations in 175 different locations around the globe. This year we will handle over 7 million tonnes of cargo across 20 different countries. Nectar has recently supplied a fleet of trucks in Africa, and partner in the development and operation of the first dedicated bulk terminal in the Philippines.

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Nectar sign multiple contracts with DBIS software

Nectar was established in 1972 and in the early 1980s revolutionized the bulk handling industry at developing ports around the world when it invented and launched the world's first mobile bagging system.

More recently Nectar has developed its strategy towards the management, operation and maintenance of terminals starting in 2011 with the Beira Coal Terminal in Mozambique. In operating the coal terminal, Nectar is responsible for all of the activities within the terminal from unloading of coal from the trains up to loading of the vessels including maintenance of all terminal equipment. The terminal has a design throughput capacity of five million tonnes per year and has a vessel loading capacity of 2,400 metric tonnes per hour.

Nectar chose DBIS to provide their terminal management system for Beira and the organizations have worked closely together on various initiatives



Standard shipping container with secure window for interaction with drivers on the weighbridge.



Container fitted out to create an office environment.

This additional functionality provides Nectar with the perfect platform to develop their terminal business in whichever direction the market requires.

To keep human resources to a minimum Nectar will use a single system administrator based in the UK to manage master data and commercial terms within the systems, training of local teams will also be performed by Nectar's own super users.

To deliver the software to the terminals in a quick and simple way the decision was made to construct containerized offices, which use modified shipping containers as administrative offices and server rooms, interconnected using Wi-Fi. This allowed the systems to be connected to weighbridges and fully tested in the UK prior to shipping by standard container liner service to the destination country where they could be set down, powered up and put into operation, quickly and easily.

DBIS and Nectar have put in place a multi-site agreement with the plan to implement the DBIS solution wherever Nectar establishes a terminal operation, to ensure consistent and remotely accessible information is provided to the key decision makers in the organization.

until 2015 when Nectar was awarded two major projects; firstly a ten-year concession to operate the Freetown Terminal in Sierra Leone and then a joint venture between Seasia Logistics Philippines Inc. and Nectar to construct a US\$18.5 million terminal in Bataan, Philippines.

Nectar will operate each terminal with a local management team but at the same time allow the central management to interact with the terminals to monitor the performance of the operations from both a process and a financial perspective. For this to work effectively Nectar needed consistency in the local operational practices and the capability to access real time information remotely. To facilitate this Nectar has followed up the decision at the Beira terminal and implemented the CommTrac terminal management system from DBIS.

In 2015 DBIS released CommTrac V4, a totally new release of the CommTrac software created using a web user interface, which is perfectly suited to the requirements for remote access required by Nectar. CommTrac V4 has also been created to meet the needs of breakbulk and general cargo terminals as well as DBIS' traditional customers in the bulk sector.



User training at DBIS' offices.

Man and machine combined make better decisions

DATA IS THE CURRENCY OF THE 21ST CENTURY

The themes 'Internet of Things', 'Industry 4.0' and 'Big Data' have become indispensable. Many industries are in the midst of a digital transformation. Also in the bulk goods industry, operations and processes will change through data analytics. The maintenance function is particularly affected. Thanks to data analytics, companies can better understand their machines than was previously possible through mere experience. Data analytics thus offers the possibility of more effective and more cost-efficient processes.

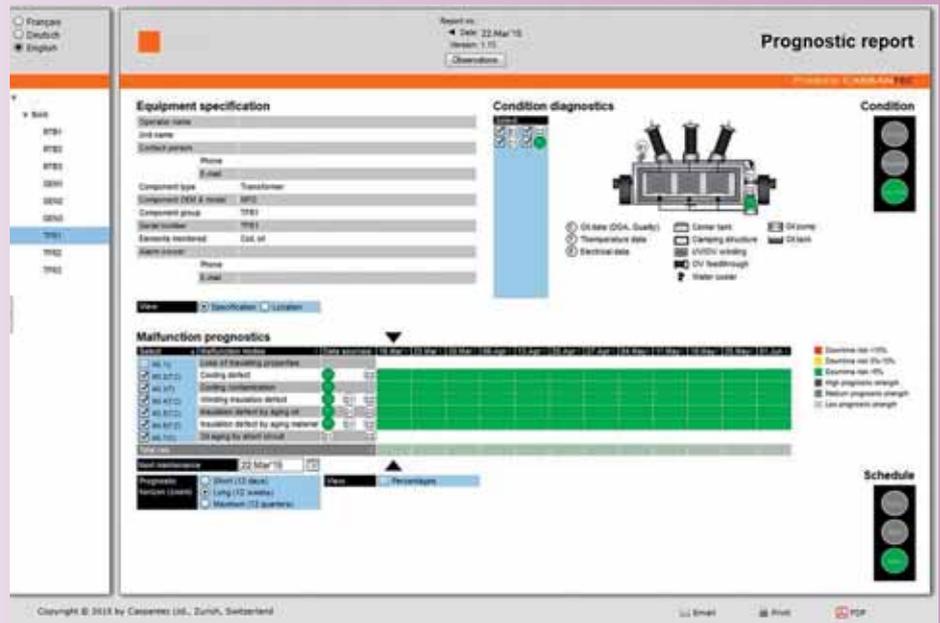
'BIG DATA' IS UNAVOIDABLE

Much has been said about the opportunities new technologies and data analytics create. The fact of the matter is that, at this point in time, it is not yet clear where the journey is taking us. The possibilities seem infinite. But the scenario of a fully networked factory is causing increasing uncertainty. A 2014 study by the Society for Consumer Research (GfK) commissioned by the Deutsche Zentral-Genossenschaftsbank (DZ Bank) showed that a total of 68% of respondents were especially concerned about the increasing demands in data security. Forty-five per cent consider too much dependence on the stability of technical infrastructure as a problem. The study showed that only about half of all SMEs (small and medium enterprises) are already dealing with digitization. A third of the respondents do not consider the issue as a whole as relevant for them. Finally, the study concludes, that in order to remain competitive, companies must seriously consider the issue of digitization.

The greatest potential in the networking of plants and processes lies in reducing costs through the intelligent use of pre-collected data. For example, most companies already use data to obtain information on the condition of their systems and conveyor belts. Such condition monitoring helps to determine system malfunctions. 'Cassantec Prognostics' of Cassantec AG, Zurich, extends the utilization of this data. Prognostics uses the same data as condition monitoring, but reinterprets it. With the help of a specially developed algorithm risk profiles are created that give precise time information about when a potential malfunction may occur in the future. Such a method fundamentally changes the way machinery is deployed because decisions about maintenance management are made on a more transparent and objective basis.

HOW PEOPLE WILL MAKE DECISIONS IN THE FUTURE

Whether consciously or unconsciously, humans make hundreds of choices every day. Gerhard Roth, a professor at the Institute for Brain Research in Bremen has determined that quite often gut decisions are the better choice. When choosing what to eat for breakfast or what to wear, that is perhaps the best way; however, for more complex decisions the basis should not be intuitive. Especially when decision-makers are faced with complex situations, data-based facts can put them on the right track.



Algorithms help people solve complex problems such as the maintenance of equipment and help them make better judgments.

At present, the basis for making many decisions is still often experience or intuition. Humans have their own 'computer', their brain. However, the brain is not immune to prejudice. Even factors such as the weather or the mood demonstrably and significantly influence decisions. Often many important characteristics are lacking for a proper analysis and assessment — an algorithm that is programmed in advance is subject to fewer such errors in reasoning. Information based on math offers the possibility for decision-makers to work with input that is objective, transparent and applicable to different situations.

Thus, for example through the use of Cassantec's Prognostic Reports, a foundation is created to make sound decisions for maintenance strategies, to pool maintenance interventions intelligently and to plan them in time to avoid unnecessary cost from a lack of preparation. Maintenance plans will no longer be created periodically and based on experience, but with a transparent, data-based structure. This saves companies huge cost.

WHAT IS HOLDING US BACK

The development has just begun: society is at the beginning of a digital transformation. 'Industry 4.0' and the 'Internet of Things' offer enormous potential to change and exercise a positive influence over the way employees work. Yet technologies such as Prognostics also face challenges. The prudent application of prognostic solutions requires an extended skill set of reliability and maintenance professionals: the ability to articulate risk, to explicate forecasts, and to consider both in asset management decisions. Prognostics complements and requires operator experience and manufacturer know-how, but it also necessitates a shift in thinking and language towards a risk management approach. In the long run it is clear that companies and professionals have to face these challenge. Companies that have not already started collecting data for sophisticated analyses and that are not planning to make use of the new possibilities will eventually reach the point where they can no longer compete in the digitalized environment.

Bedeschi acquires Dearborn Mid-West Conveyor

In September this year, Bedeschi S.P.A. of Padua, Italy announced the recent asset purchase of the Bulk Group of Dearborn Mid-West Conveyor Co, a leading provider of turnkey bulk material handling systems for utility, mining, cement, fertilizer, refinery and marine terminal markets.

Founded in 1947 the Bulk Group with the new name Bedeschi Mid-West Conveyor LLC (BMWC) has operations located in Lenexa, Kansas. From here it designs, fabricates and installs complex bulk materials handling systems including pipe conveyors and rotary ploughs.

Rino Bedeschi, Managing Director of the Bedeschi Group said, "We are excited about BMWC becoming part of the Bedeschi Team. We are an industrial group based in Italy and specialize in bulk material handling and marine logistics. Having been in business for 107 years, we are sure the merger will serve our clients with a wider range of products and services with broader organizational capabilities for future domestic and international projects."

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Super heavy-duty conveyor belt cleaners for severe operating conditions

A family of primary conveyor belt cleaners has been engineered for the world's fastest, most heavily-loaded belts, with industrial-strength construction that delivers effective cleaning, minimal maintenance and long service life, even under punishing conditions. Martin® SHD Cleaners have been proven on belts up to 10 feet (305 cm) wide — with speeds as high as 2,000FPM (10m/sec) — carrying loads up to 300,000 tonnes per day. Designed with patented 'CARP' technology to achieve constant angle geometry to match pulley diameter accurately across all stages of service life, the massive urethane blades deliver up to 42 square inches (271cm²) of wear surface — more than seven times the wearable surface of standard cleaner designs. With a broad range of colour-coded, high-performance blade choices available, the cleaners can be specified to suit a wide variety of materials and performance requirements.

The SHD Series was developed for super heavy-duty applications, with structural steel components to prevent bending of the main frame. The extremely durable construction helps eliminate carryback, reduce emergency outages and minimize unscheduled downtime. In some applications, it has been shown to be the only design that can withstand the severe operating conditions.



Martin® SHD Cleaners have been engineered for the world's fastest, most heavily loaded belts.

"This design can allow conveyor operators to improve maintenance planning and reduce expenses," observed product engineer Daniel Marshall. "With lower maintenance requirements, it saves money through fewer repairs and blade replacements, as well as faster service procedures," he said. "The reduced carryback means improved working conditions and plant safety, maximized equipment life and reduced cleanup."

The SHD 1200 Series Cleaner is built for high-speed conveyors with a head pulley larger than 48in (122 cm) in diameter and belt widths from 42–120in (10–305cm). With blades up to 12in (30.5cm) tall, a heavy structural steel frame prevents bending, even with high tonnages and large lumps. The SHD 1200 Series Cleaner was designed in tandem with its tensioner system to provide effective cleaning and reduced service requirements.



Fully compatible with reversing conveyors and belts with mechanical splices, it has a service temperature range of –30°F to 300°F (–34°C to 149°C) and can be used in corrosive conditions or underground applications.

Like its larger cousin, the SHD 600 Series Cleaner is installed in the primary position, but is designed for pulleys smaller than 48in (120cm). Built for tough, mine-grade cleaning, the unit's durability has been proven in some of the bulk handling industry's toughest applications.

"The SHD Series was originally designed for a severe-duty mining application, built to handle the overburden at one of the largest pit mines in the world," Marshall continued. "Every cleaner they tried was getting destroyed by the harsh conditions. There just wasn't anything on the market that could withstand the speed and abrasive forces, so we completely re-engineered the conventional belt cleaner design, from the I-beam frame to the huge blade segments. In fact, these cleaners are so large that we had to invent a way to properly tension them," he said.

The SHD product family is finding utility in a variety of industries, wherever applications involve large high-speed belts. The series is among a number of Martin Engineering products helping conveyor operators satisfy the demands for larger, faster systems that can move more material, without sacrificing safety or component longevity.

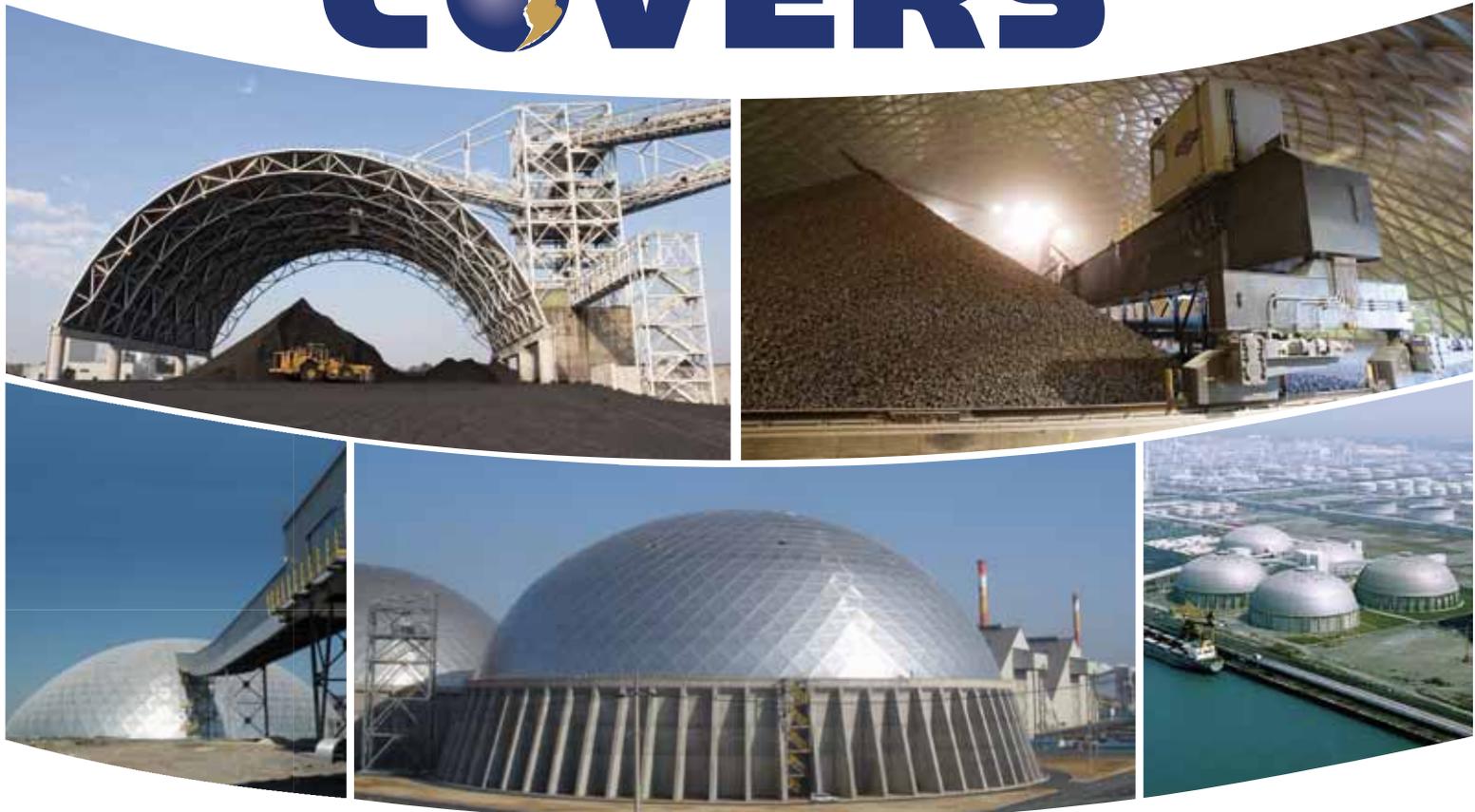
Founded in 1944, Martin Engineering makes bulk materials handling cleaner, safer and more productive. The company supplies flow aids and conveyor products around the world for a wide variety of bulk material applications, including coal, cement, rock/aggregate, biomass, grain, pharmaceuticals, food and other materials. The firm is headquartered in Neponset, IL, offering manufacturing, sales and service from factory-owned business units in Brazil, China, France, Germany, Indonesia, Mexico, South Africa, Turkey, India and the UK, and under exclusive licence with ESS Australia.



The SHD Series was developed for super heavy-duty applications, with structural steel components to prevent bending of the main frame.

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Superior Industries introduces new flush mount, quick install belt scale

In mid-September this year, Superior Industries, Inc., a major American manufacturer and global supplier of bulk material processing and handling systems, launched a new belt scale for dry bulk material handling applications. The new scale is characterized by a unique, flush-mount design, so owners and operators can avoid cutting or torching their conveyor frame for installation. Superior says the scale will install without interfering with the existing conveyor frame. Engineers simplified installation further by designing a much sturdier weighbridge than industry average. This robust design prevents any wobbling or tipping for a stress-free installation.

Superior says its integrator — constructed with a large, colour display — is designed with an easy to operate setup and

adjustment wizard. The standard model integrator includes an onboard Ethernet port (wireless communication), two independent RS-232 serial outputs (for optional printer and/or scoreboard display) and a battery backup feature. In addition, the integrator is equipped with self-diagnostics capabilities for operators to view setup parameters, load cell signals, I/O settings, speed sensor frequencies, angle sensor readings and calibration specifications.

Utilizing a modular design, Superior's brand new scale fits to belt widths between 18-inches (460mm) and 72-inches (1,830mm). The unit is shipped with a scale quality, Superior brand idler in CEMA class ratings of B, C, D or E. Each scale is designed with an accuracy rating of $\pm 1/2\%$ and is suited for dry bulk applications producing up to 3,000 tonnes per hour.



ABOUT SUPERIOR INDUSTRIES, INC.

Superior Industries engineers and manufactures groundbreaking, bulk material processing and handling equipment and cutting-edge components related to the machinery. From its headquarters in Morris, Minnesota, USA, the manufacturing firm supplies bulk crushing, screening, washing and conveying systems for industries including construction aggregates, mining, bulk terminals, agriculture, power and biomass. In addition to its home plant in Minnesota, the 43-year-old Superior operates from additional engineering and manufacturing centers in Arizona, Georgia, Illinois, Michigan and Nebraska, USA; Alberta and New Brunswick, Canada; and three production facilities in Brazil.

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Orts wins major European orders



ORTS GmbH dates back to 1972 when it was founded as an engineer office and consulting company, specializing in the construction of grabs (main business) and many other kinds of bulk handling equipment.

ORTS offers a wide range of grabs and lifting beams, many of which are in use on-board bulk vessels to load/unload cargoes. They are particularly useful at ports that do not have the infrastructure to offer their own loading/unloading equipment. This means that the self-loading/unloading vessel can call at a wider variety of bulk ports, without restriction.

Among the equipment offered by ORTS are electro-hydraulic grabs; diesel hydraulic grabs; rope-grabs; lifting beams and special constructions.



for its hydraulic grabs

RECENT ORDERS

ORTS GmbH has delivered two of its radio-controlled diesel-hydraulic grabs to a customer in Oceania. These grabs are fitted with special clamshells for very fine dry bulk cargo. The design of these clamshells makes it possible to handle very fine dry bulk cargo without spillage.

The speed and performance of ORTS diesel-hydraulic grabs give a competitive advantage to their users.

A European shipping company ordered several sets of ORTS 12m³ volume electro-hydraulic grabs. This shipping company has a new-building project in China and all bulkers will be fitted with ORTS grabs and crane equipment, which is necessary to operate electro-hydraulic grabs.

A Greek shipping company is going to fit its new-build bulkers with 14m³ volume electro-hydraulic grabs. The order includes eight EHS-B 14m³ grabs and the associated crane equipment.

A British company has ordered a radio controlled diesel-hydraulic grab for its crane operations. The company chose the ORTS diesel-hydraulic to be flexible with its cranes and because of the grabs' performance.

ORTS has also manufactured an EHM 6m³ electro-hydraulic orange-peel grab for a German steelwork plant. Because of the special requirement due to existing cranes and grabs, modifications are necessary to enable the company to inter-change the between the old grabs and the new one. The modifications were made to enable the customer to also use the existing spare parts in stock not only for the old grabs, which are still in use, but also for the new grab from ORTS.



ORTS carries out the load testing on its grabs in a unique way. During load testing, loads are carried using the grab's clamshell knives only — this is akin to a man carrying a heavy load using only his fingertips. In this way, ORTS is able to check and prove the structural stability of every single one of its grabs. Tests are always carried out under the supervision of an inspector from a well-known classification company.

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The Group

Van Beek makes sampling simpler

Checking product during processing is very important to maintain quality. But how do you safely take a representative sample without having to shut down the whole process? Van Beek has developed the Sample Screw for this purpose: an innovative sampler that is easy to clean.

This machine is ideal for taking representative product samples from containers, hoppers or in-line (for example after an outlet or in a discharge pipe). Using a small screw conveyor a sample of the material is taken safely from the product stream without disrupting the process. Even materials with poor running qualities can be controlled in this way because a screw is used.

EASY TO CLEAN

Stringent hygiene requirements are not a problem for the Sample Screw. The sampler is easy to dismantle for quick and complete cleaning. It can be used in the dairy, food, pharmaceutical and chemical industries. Samples can be taken for example of powders, flocks, granules, flakes, pellets and slurries. The sample size and frequency can be adjusted.

EASY TO INSERT

Van Beek's sampler is driven by its own air motor or electric motor (with gear unit) and is easy to insert in the production line. Whether this involves bunkers, silos, hoppers or bulk transfer, in most cases little or no adjustments have to be made to the handling system. Only a small passage through the wall is enough to pass through the non-driven side of the Sample Screw. And should a minor adjustment be needed, then Van Beek's years of experience in the process industry guarantees customized advice.

Modern technology in a new swivel from Indexator

Indexator Rotator Systems AB is launching its new K100 hose swivel aimed at today's modern hydraulic hose systems in forestry and construction machines.

The new hose swivel is the fruit of several years' research and development whose many tests and long field trials gave extremely positive results.

"We succeeded in achieving an extremely good service life for the K100 thanks to our unique, newly developed seal solution and a new type of surface treatment with excellent wear and corrosion resistance," design engineer Julia Rönnerberg tells us. "I must say we really are at the leading edge of developments. The entire swivel structure has undergone a major upgrade and copes well with bending loads while torque resistance is also low. This will mean a lot fewer hose ruptures," declares Rönnerberg.



Julia Rönnerberg, Design Engineer at Indexator Rotator Systems AB.

Many swivels have major problems with higher pressures greatly increasing swivel torque resistance, which leads to twisted hoses and dramatically shorter service lives for both hoses and swivels. In the many tests, Indexator noted that the K100 only has half the torque resistance as other swivels on the market, even at low pressures.

"With the new technology, the swivel rotates easily even at extremely high pressures; the K100's torque resistance is lower than the next best swivel on the market by a surprising amount," says Rönnerberg.

Additional advantages are the new swivel's compact design and small external diameter, which make it easy to build into various applications.

SWIVEL K100

Indexator Rotator Systems AB is a global leader in the manufacture of rotators, swivels and accessories.

Today, Indexator is an extremely strong brand in the forestry, material handling and recycling industries all over the world. The company conducts world-class R&D that includes a dedicated, in-house test lab that international equipment manufacturers also turn to develop new products and functions. The company currently has 140 employees and annual sales of around SEK 230 million. A high proportion of sales go to export, with around 80% of production being sold to more than 40 markets around the world.



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Innovation in dust-free bulk loading



With environmental concerns for ports and bulk exporters becoming more strict, several companies are turning to a new technology to stop pollution during shiploading.

BlueWater Misting (BWM) has developed a dust-suppression system that fits to the top of the vessel hatch and creates a barrier of fine mist that prevents escape of fugitive dust emissions.

WHAT IT IS

The system consists of a power pack that sits on the quay connected to the power and water of the port. These deliver a high pressure spray to an array of purpose-built spray bars that are temporarily fitted to the hatch combing by the stevedores during loading.

HOW IT WORKS

The BWM system creates a complete mist screen at the top of the hatch.

By wetting airborne fines, the weight of each particle is increased. These heavier combined particles of dust and water fall out of the air back to the pile. BWM used science and its experience to create moisture 'curtains' in and around ship's holds to make contact with the dust fines, increasing their mass and removing them from the air stream.

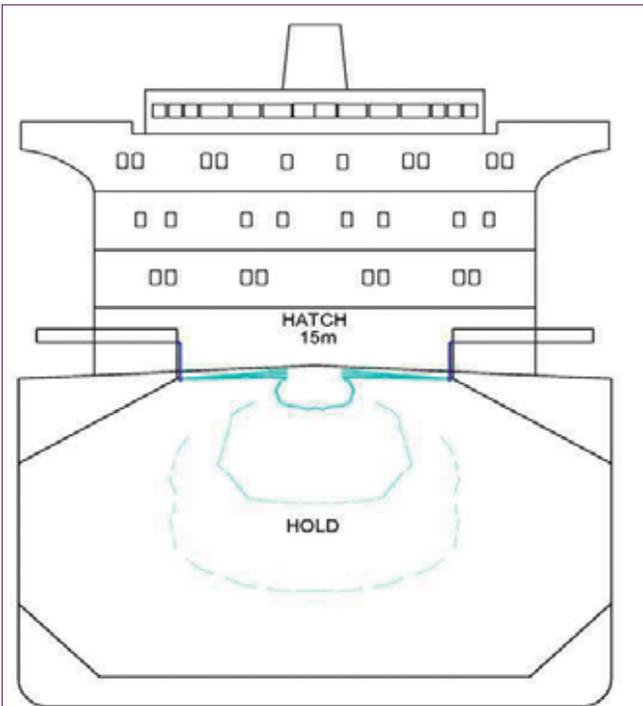
WHERE IT IS USED

The systems are deployed on several continents in Australia and Asia, but the most interesting systems are in Chile and South Africa.



Chile

The System is employed in Chile at the port of Antofagasta to load very valuable copper concentrate. The concentrate is valuable as it contains gold and silver as well. In this case, dust is considered 'money blowing in the wind'. While the companies involved are very environmentally aware, they utilize the misting



system in loading stopping dust escaping from ships' holds. The benefit is huge saving in loss of valuable concentrate.

South Africa

Port Elizabeth is the start of the Garden Route in South Africa, a place of great unspoilt beauty with a thriving car export facility. Local mining company Tshipi wanted to export manganese fines, but the local authorities had concerns over the dust, particularly as the car loading facility was nearby.

Using the innovative Blue Water Misting dust suppression system fitted to the hatch, Tshipi is able to prevent fugitive dust emissions during shiploading. This was a great win for industry — and the local community, providing a number of jobs — showing mining can be green.



NOT ALL DUST IS THE SAME

There is a range of different materials and particle sizes. Before each new job BWM consults with the client and provides a bespoke designed system spray nozzles and bars that capture that dust. BWM can also provide a dry fog for material that can't be wet like grain or cement

ALL APPLICATIONS

The BWM system is very flexible and can be deployed with any type of loading system. Systems are currently in used with tipplers, grab and shiploaders.

Cement: too hot to handle?

major equipment suppliers detail their cement handling solutions



AUMUND deep-drawn pan conveyor, type KZB.

Louise Dodds-Ely

Handling and storage solutions for the global cement industry from AUMUND

Emerging markets worldwide create a permanently increasing demand for cement that significantly influences the AUMUND Group as well. As reliable and ingenious partners for the cement industry, the AUMUND product companies constantly have to find innovative solutions to equip new plants or to optimize existing installations or machines. This expertise, gained over decades of experience, guarantees a deep understanding of the processes and the efficiency needed to produce cement to satisfy this soaring demand.

The economic rise of formerly underdeveloped nations influences and pushes industries worldwide. Growth in emerging markets like Brazil, Russia, India and China — the so called BRIC states — includes not only growing revenue, but also the creation and evolution of a modern infrastructure.

Building commercial and residential buildings, roads or a transportation infrastructure is impossible without the use of vast quantities of cement. So, in turn, demand soars. The cement industry has evolved into a growing market worldwide. As reliable partners of the cement industry, the companies of the AUMUND Group provide the machinery needed for the increased production, transport and storage of cement.

CONVEYING SOLUTIONS FROM AUMUND FÖRDERTECHNIK

AUMUND Fördertechnik GmbH started serving the cement industry by installing the first apron feeder for clinker transport about 50 years ago. Since that time the company has evolved into a specialist in conveying and storage for the industry and peripheral areas. The range of solutions encompasses feeding,

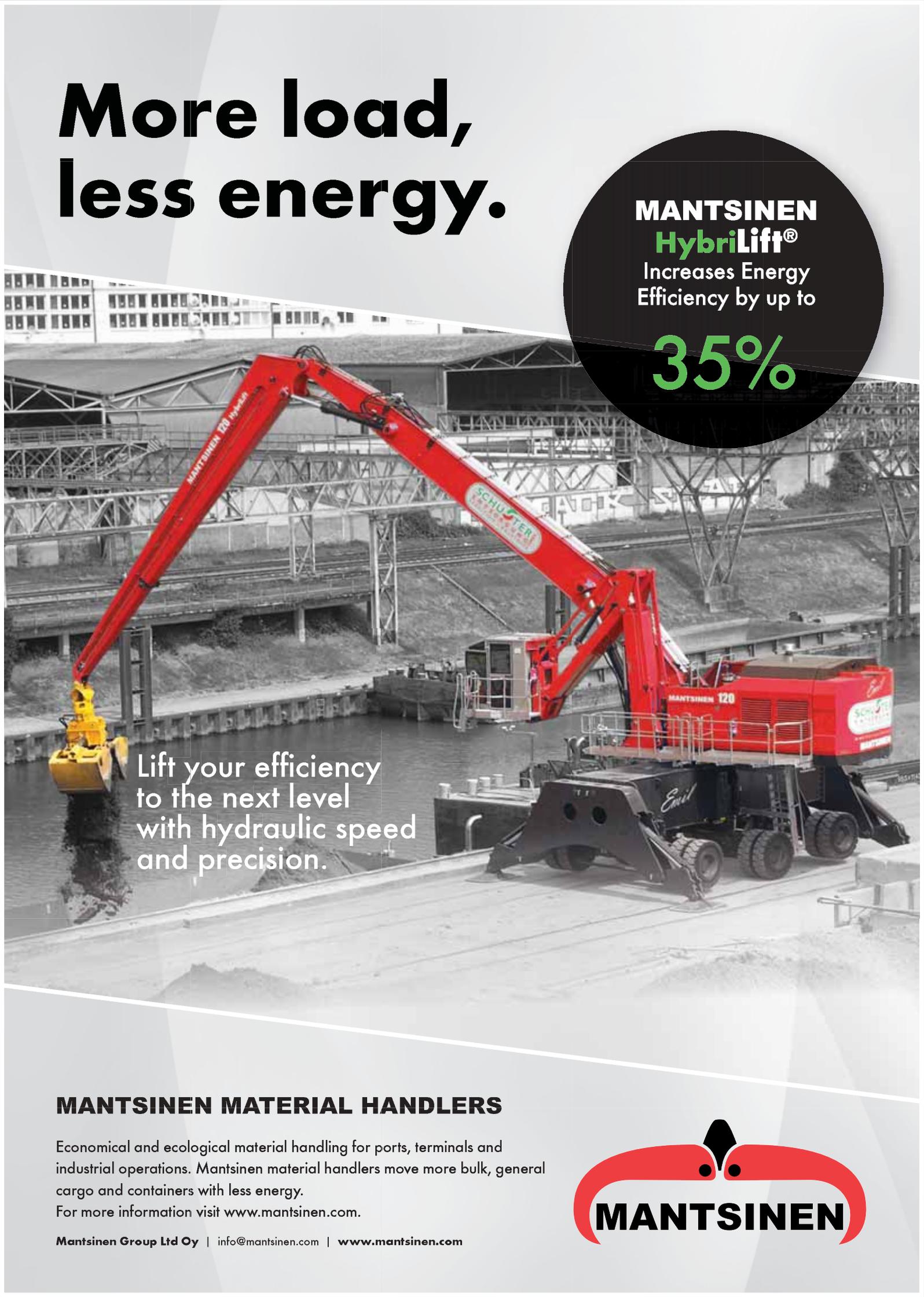
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discharge and transport during all process steps of cement production.

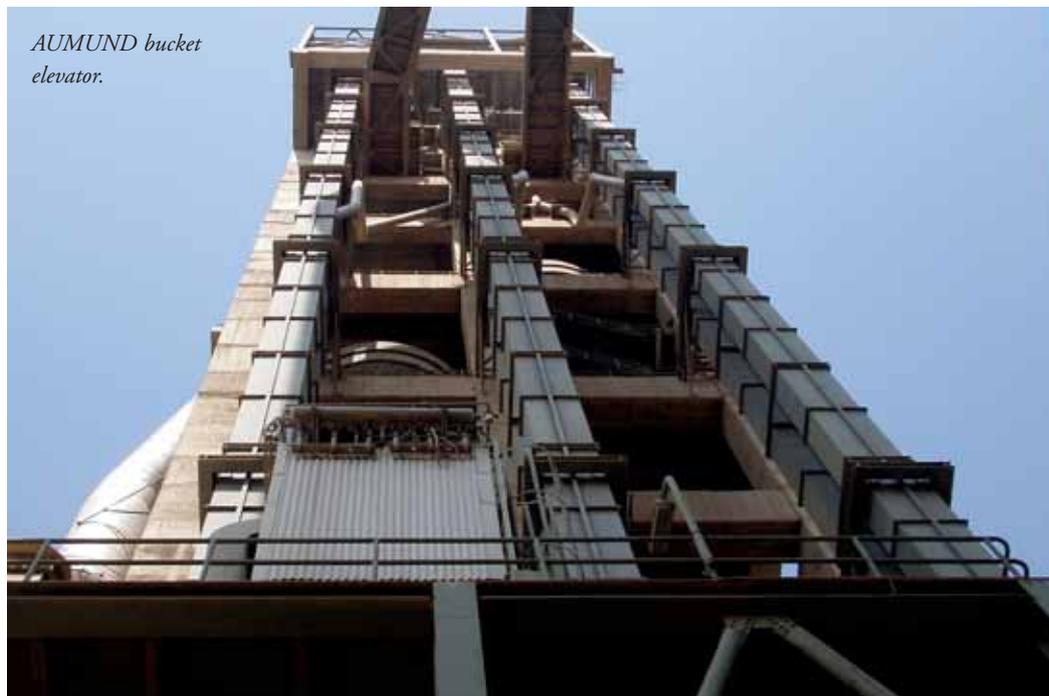
Deep-drawn pan conveyors (see picture on p77) of different types are the transport systems of choice for the transport of cement clinker in continuous operation. Conveyors of the KZB type provide capacities exceeding 1,600tph (tonnes per hour). They can handle inclinations of up to 30°. Steeper inclinations are served by deep-drawn pan conveyors type KZB-Q fitted with baffle plates. These specialized plates allow conveying at inclinations up to 45°.

KZB conveyors of all types are using drive chains with breaking loads of up to 3,900kN/chain strand. The chains make conveying heights of up to 90 metres possible.

If inclinations exceed 45°, for instance due to unfavourable space conditions, AUMUND bucket apron conveyors type BZB have to be employed. They cover inclinations up to 60° and provide a capacity up to 600tph. Transport beyond 60° of inclination is the field of operations for bucket elevators.

The high-performance AUMUND belt bucket elevators, type BWG (see picture above), are used to cover lifting heights up to 175 metres with a capacity beyond 1,850m³/h and at a material temperature maximum of 130°C. Material with higher temperatures peaking at 400°C, will be lifted by AUMUND central chain bucket elevators type BWZ at a capacity of 900m³/h. This capacity can be doubled by using an AUMUND double bucket elevator, type BWZ-D. Its performance exceeds 1,800m³/h. The central chains are assembled from forged links and contribute to a long service life of the elevators.

AUMUND Fördertechnik addresses further transport needs of the production process, with its specially designed arched plate



AUMUND bucket elevator.

conveyors, armoured chain conveyors, pivoting pan conveyors, and in particular its wear-resistant 'en masse' chain conveyors and apron weigh feeders.

STORAGE SOLUTIONS FROM SCHADE LAGERTECHNIK

The logistics of the various raw materials, fuels and additives play an important role in cement production. Limestone and other base materials need to be permanently available in sufficient volumes to maintain the production process. This need, in turn, demands ample storage on location or nearby to fend off a possible interruption in supply for whatever reason. The AUMUND Group company SCHADE Lagertechnik GmbH is the specialized partner of the cement industry for the installation of strategic material storage and complementary blending beds.

Blending beds are also used for the homogenization of the material from different sources or deliveries. The bridge-type reclaimers from SCHADE used to return the stockpiled and homogenized material into the production process are equipped with two specially developed harrows. They scrape thin layers of material from the pile surface and transfer it as a free-flowing

material to the SCHADE scraper reclaimer chain system at the bottom of the cross-section. Due to their size being almost identical to the stockpile's cross-section, the harrows only need to move about a few metres in each direction (see below). This grants that all different material layers in the pile cross section will flow down continuously



Harrows of SCHADE bridge type reclaimer.



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Samson® material feeder clinker intake with integrated dust extraction.

to the SCHADE scraper reclaimer chain system. With a shovel width of 1,750mm, it transports the material at the floor of the blending bed to the side via the concrete ramp. At the side of the ramp belt conveyors installed in longitudinal direction along the stockpile, move the reclaimed material on into the production stage.

HANDLING SOLUTIONS FROM SAMSON MATERIALS HANDLING

A quite comprehensive range of solutions for bulk materials has been developed by SAMSON Materials Handling — another member of the AUMUND Group — over a period of more than 40 years. Flexibility, reliability, quality, safety and performance are at the heart of its every product concept. Many uses of the company's machines are to be seen in the cement industry. For example, the Samson® material feeder is the ideal solution for all raw material and solid fuel intake from dumper trucks and rail cars. Its surface installation simplifies the plant layout and reduces project costs for both, the construction of new works and for the development of an existing plant.

The mobile shiploader and Stormmajor® boom feeder provided by SAMSON offer the cement plant operator or trader a flexible alternative to conventional fixed installations for the storage of raw materials and export of cement clinker directly from truck to ship.

For clinker exports, the mobile shiploader receives material either by dumper trucks or by loading shovel for discharge directly to vessels up to Panamax size. Handling rates reach up to 1,500tph. The option of full dust control measures can be utilized to minimize environmental pollution.

The Stormmajor® receives raw material and solid fuel for stockpiling directly by dumper trucks. It combines the performance of a fixed plant with the flexibility of complete mobility. Performance and reliability are not impaired at all.

EXEMPLARY CASES FROM BRAZIL AND RUSSIA

Solutions from AUMUND companies are in high demand with the BRIC states. So only five years after delivering a first bridge scraper, SCHADE Lagertechnik delivered a circular column equipped spreader to the Sobradinho plant of the Brazilian cement producer Ciplan Cimento Planalto S/A. The machine provides a flow rate of 1,800tph (max 2,000tph) and a 23-metre beam as well as a belt width of 1,400 millimetres. Besides the scope of delivery includes another SCHADE bridge scraper equipped with a harrow covering the entire area of the stockpile's profile. The bridge scraper can be operated with a flow rate of 700tph.

In Russia the customer OAO Mordovcement contracted AUMUND for the construction of new process lines and for the large-scale modernization of existing facilities. All in all, OAO Mordovcement has purchased over 100 machines from AUMUND over the years. SCHADE Lagertechnik last delivered a storage system for additives designed as a covered rectangular stockyard. The scope of delivery included a travelling tripper car



for material feeding to the stockpile, a cantilevered boom reclaimer for material reclaim as well as feeding and discharging conveyors. Further machines delivered to different facilities are heavy duty apron feeders, rotary discharge machines as well as different kinds of conveyors and bucket elevators.

CONVERSION AS AN ALTERNATIVE TO BUYING A NEW MACHINE

However, the installation of a new machine is not always the best solution for the customer. The conversion and modernization of existing equipment might be more in his best interest. A record breaking conversion project was realized by AUMUND in India. At the Himachal Pradesh plant of Ambuja Cement, one of the largest and most modern cement works in India, a bucket elevator had to be renovated, after continuously raising the raw meal to the pre-heater tower 24/7 at a rate of 650tph.

Whilst the machine remained in service a detailed inspection revealed that a replacement belt would soon be required. At 170 metres centre distance, this is the highest belt bucket elevator installed in the world today and as such only a very few companies possessed the know-how to deliver a competent replacement service.

Originally, the machine was fitted with a steel cord belt of width 1,450mm and tension rating of 3,500N/mm. AUMUND decided to offer an alternative based on its own design concept resulting in a belt width of 1,050mm and with a bucket size of 1,000mm at 430mm pitch.

In addition to the new belt the elevator will be fitted with new drive pulley including friction linings and rubber bucket mounting strips all to be supplied locally. The casings, inlet and outlet plus the complete drive unit will remain unchanged.

The AUMUND belt concept is very different in that continuous close pitch longitudinal ropes are employed. There is no need for rope-free bucket mounting spaces. Additional wire ropes are running laterally across the width of the belt adding considerable lateral stiffness without significantly changing the belt longitudinal flexibility. This cross-stabilized construction gives improved directional stability and better tracking to the belt.

Using continuous wire ropes without rope free spaces at close pitch both longitudinally and horizontally gives maximum strength and stability. However, this technology does require the bucket fixing to be punched through the belt and steel ropes through and through. This is taken into account with the tension calculation. The ruptured ropes can be ignored in the full belt width tension rating.

To punch the necessary holes into the belt, AUMUND has



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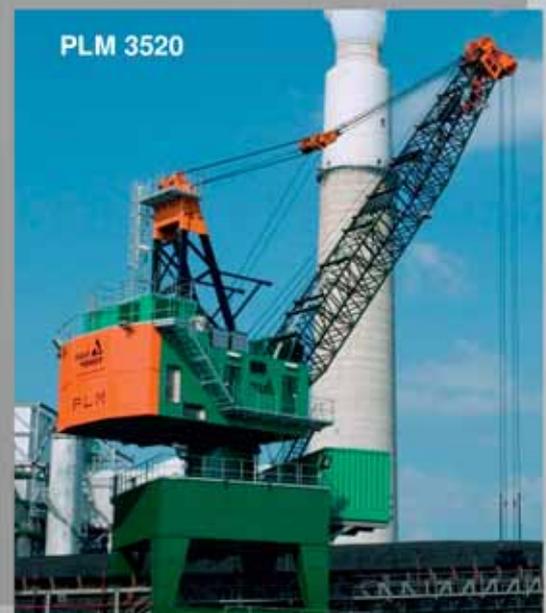
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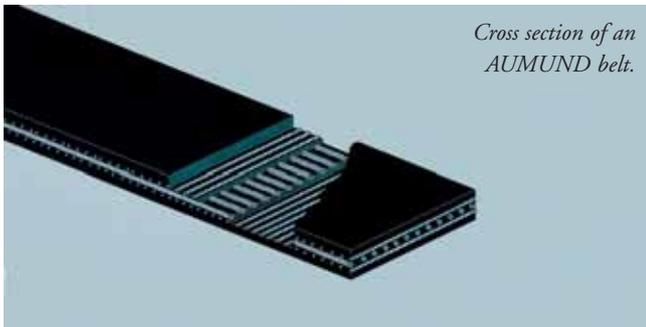
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*Cross section of an
AUMUND belt.*

developed a special punching machine design which provides clean fixing holes accurately aligned relatively to the belt edge and at precisely the correct pitch. The belt is held in a cassette and is advanced automatically under the punching frame using a precision encoder to measure the pitch. The belts are prepared at the AUMUND works in Germany and shipped to site worldwide to the exact required dimensions including a prepared joint and the required clamping strips.

This illustrates the AUMUND conversion and refurbishment service offered across the equipment range including belt and chain elevators, pan and bucket conveyors plus plate feeders. A converted machine can be supplied with all new moving parts by AUMUND retaining often only the structural elements. This results regularly in a substantially new machine with significant cost reductions compared to outright replacement. With minimum changes to the structural parts and chute works, installation time is greatly reduced and machines may generally be upgraded to the AUMUND standard during a scheduled outage. Of course, once upgraded in this way the client can expect the usual AUMUND dependability, access to service support and

genuine AUMUND spare parts. Not only existing, life expired machines can be revitalized and upgraded this way. At the same time AUMUND can often tease out additional performance thus opening the possibility of plant capacity improvement with minimum new investment.

SUMMARY

The three companies of the AUMUND Group are not only the suppliers of a vast range of highly specialized machines for the cement industry. They can also rely upon a multi-decade experience and a staff of highly experienced engineers and specialists to develop solutions for individual needs of customers from the cement industry worldwide.

ABOUT THE AUMUND GROUP

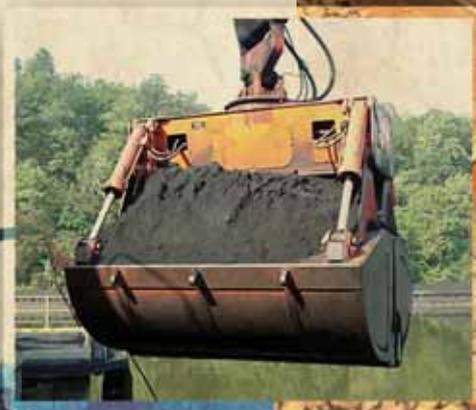
The AUMUND Group is active worldwide. The conveying and storage specialist has special expertise at its disposal when dealing with bulk materials. With their high degree of individuality, both its technically sophisticated as well as innovative products have contributed to the AUMUND Group today being a market leader in many areas of conveying and storage technology. The manufacturing companies AUMUND Fördertechnik GmbH (Rheinberg, Germany), SCHADE Lagertechnik GmbH (Gelsenkirchen, Germany), SAMSON Materials Handling Ltd. (Ely, England), as well as AUMUND Logistic GmbH (Rheinberg, Germany) are consolidated under the umbrella of the AUMUND Group. In conjunction with the headquarters of the manufacturing companies, the global conveying and storage technology business is spearheaded through a total of ten locations in Asia, Europe, North and South America.

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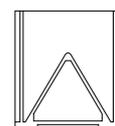
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Dust trap - Upgrading

Flowrox heavy duty valves and pumps in cement handling

The performance of any reliable process starts with the most basic components. This applies also to the selection of a process valves and pumps. Cement is always an abrasive and harsh medium to handle and transfer which highlights importance of the right selection even more. If you settle for a conventional product, be prepared for a short time planning in maintenance.

RELIABILITY AND COST EFFECTIVENESS WITH PINCH VALVES

There are numerous types of valves that are conventionally used in cement handling systems such as butterfly valves, knife gate valves, switching valves and hammer valves. In addition to the conventional technologies, there are option such as pinch valves, specifically designed for abrasive conditions. Pinch valves have been in the industry for many years but it is still quite new to many cement manufacturers. A pinch valve can be used throughout the cement process, the most typical applications including switching/diverter and silo isolation valves, blow pot valves and various other isolation and control duties.

The most important factor for valves utilized in cement handling for example in pneumatically conveyed systems is how well and tightly the valve is able shut off, since a very small amount of cement leakage becomes quickly a large leak due to the high velocity wear. One contaminated silo can cost up to €230,000/US\$250,000 when product loss, wasted time and inconvenience to plants operations are counted together. A pneumatic conveying systems based on blow pots are one of the most typical transfer methods in a cement plant. The valves in a blow pot are typically cycled every three minutes and are under a high continuous stress. It is very important that they close tightly on the abrasive cement powder being conveyed to the silos and don't allow any leakages.

A pinch valve utilizes a rubber hose (or tube) that is pinched by one or two bars to squeeze the rubber hose closed to prevent flow. When closed, the valve is 100% air and product tight and no leakage occurs even with small particles in the medium. The greatest advantage of pinch valve is that when being in open position, it is 100% full port and acts as an extension of the piping system. It has smooth inner surface with absolutely no pockets or cavities which could lead to material buildup and eventually valve failure. Typical service interval for a high quality Flowrox pinch valve on silo isolation is two to five years.

When the rubber sleeve fails it can be quickly removed and a new one installed in a very short time frame and with just a fraction of the cost compared to new valve. In more than 95% of the cases the rubber sleeve is the only spare part required by cement plant.

INCREASED PERISTALTIC PUMP HOSE LIFETIME WITH THE ROLLER DESIGN

Cement manufacturers utilize various pump types in the cement manufacturing process, for example in pumping grinding aids such as glycol, amines and acetic acid to help cement particles to flow efficiently. One of the applicable pump types for grinding aid and other cement duties is a peristaltic hose pump, which are based the peristaltic effect: as the cylindrical rotor rotates along the hose inside the pump, the process medium gets pushed forward

through the hose.

Newest and the most advanced peristaltic designs use either single or double rollers, which can eliminate 80% of the friction caused by sliding shoe designs, allowing the pumps to run at higher RPMs. A roller design pump can run at higher rpms and still produce significantly longer hose lifetime than a shoe design pump. The roller design requires only a fraction of the glycerin used in shoe designs.

The number one determining factor of a peristaltic pump hose lifetime is the number of times the hose is compressed even though the harsh medium also has an impact. A majority of peristaltic pumps compress the hose two times per revolution. A Flowrox Peristaltic Hose Pump with the single roller compresses the rubber only once per revolution and produces the longest hose lifetime of any peristaltic pumps and also superior service interval over other pump types in continuous and abrasive duties. In almost all cases, the hose lifetime of a Flowrox single roller pump is at least two times longer than with a shoe or multiple roller designs and may even be four to five times longer.

Flowrox Peristaltic Hose Pumps have high turndown ratio, making them ideal for medium dosing and transfer. They provide accurate dosing even with harsh mediums like grinding aid additives or cement slurries as the pump discharge flow does not depend on the pipeline pressure. The operators do not have to worry about overheating even with high continuous flow rates.

Flowrox is a manufacturer of heavy duty industrial valves and pumps. In addition, it offers its customers flow control automation solutions and comprehensive after-sales services. Headquartered in Lappeenranta, Finland Flowrox Group has subsidiaries in USA, Australia, South Africa, China and Russia.



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Tunisia quarry loyal to Case wheel loaders for over 25 years



The quarry 'Les Carrières de L'Ariana', a family business in the Raoued-Ariana region of Tunisia, purchased the first Case 821 wheel loader in 1989. Founder Mohamed Djelassi was so delighted with its performance and the support he received from his Case dealer Sotradies, that the company remains loyal to the brand and dealer to this day — even after his son, Omar Djelassi took over the management of the company in 2011.

with exceptionally low fuel consumption — great for our bottom line! As for their reliability, we know we can absolutely count on them to perform tirelessly, day after day in the tough conditions of the quarry. Just think that our first Case wheel loader, the 821 purchased by my father, is still going strong with over 67,000 hours on the job. It is a special machine to me; I take care of its maintenance and repairs personally, and it's a delight!"

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'Les Carrières de L'Ariana', which covers an area of 14ha, produces aggregates for the building industry and for concrete mixes. In addition to the original 821, the quarry relies on four Case wheel loaders — a 921 and a 1288 purchased in 1995 and two 921C units — to load the trucks day, day out.

"When choosing a wheel loader we look first of all for a powerful and highly reliable machine," explains Omar Djelassi, who was the company's technical director until he took over as general manager. "Case wheel loaders deliver in spades on both counts. They keep up consistently high levels of performance, with extremely fast cycles in loading the trucks and efficiency in transport applications. And they do all this



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'THE EXCELLENT RELATIONSHIP WITH OUR DEALER IS ONE OF THE KEY REASONS FOR CHOOSING CASE'

Djelassi is very satisfied with the support 'Les Carrières de L'Ariana' receives from Case dealer Sotradies: "The good relationship with our dealer is very important to us: this and the equipment's performance are the reasons we choose Case for our equipment. Sotradies give us a very high level of after-sales support. Parts availability, which is critical to keeping our machines working, is very good. And, when necessary, Case steps in to support our dealer so that downtime is kept to an absolute minimum."

Sotradies, part of the UTIC group and Case dealer since 1996, serves construction businesses from their headquarters in Tunis and three sales points in Sousse, Sfax and Kébil. They support customers with their well equipped workshop and provide on-



site technical service with their mobile workshop. "We know that, as Djelassi pointed out, the way we support them plays a big role in their choice of equipment," explains Slim Tlili, sales manager. "At Sotradies we strive to provide all-round service that hinges on three key elements: advice, assistance and proximity. That's what keeps customers like 'Les Carrières de L'Ariana' coming back to us year after year when they need new equipment."

"That's true," adds Djelassi. "In fact, we have been so happy with our wheel loaders that we also have four Case crawler



excavators in our fleet — a Case Poclair 1033 and three B Series CX excavators, all of which have been performing flawlessly and reliably throughout the years."

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Family firm overcomes adversity – sets foundation for loading spout industry in Northern Michigan, USA

At 14 years of age, I would sit in an office and bind marketing books together for our sales department, writes *Walter Pair of Midwest International*. This was my gig every day after school. It wasn't really an office, more of a storage room. It had no windows or ventilation for that matter. The lighting was an overhead fluorescent tube that would flicker on and off no matter how many times it was adjusted. There was a table with a binder, and a series of shelves to store photos, documents, and literature. There was a generator in the office, which supplied power to all the electrical outlets in the building in case of a power outage. The advertising manager in the office adjacent to me would make me close my door, enclosing me in this dreadful room because the sound of the generator was too irritating for him to listen to. It was a loud whining hum, like the sound of a weed whipper left on idle. A more logical minded person might have put on a set of earphones. But I just sat there and listened to it, grinding out sales brochures day after day.

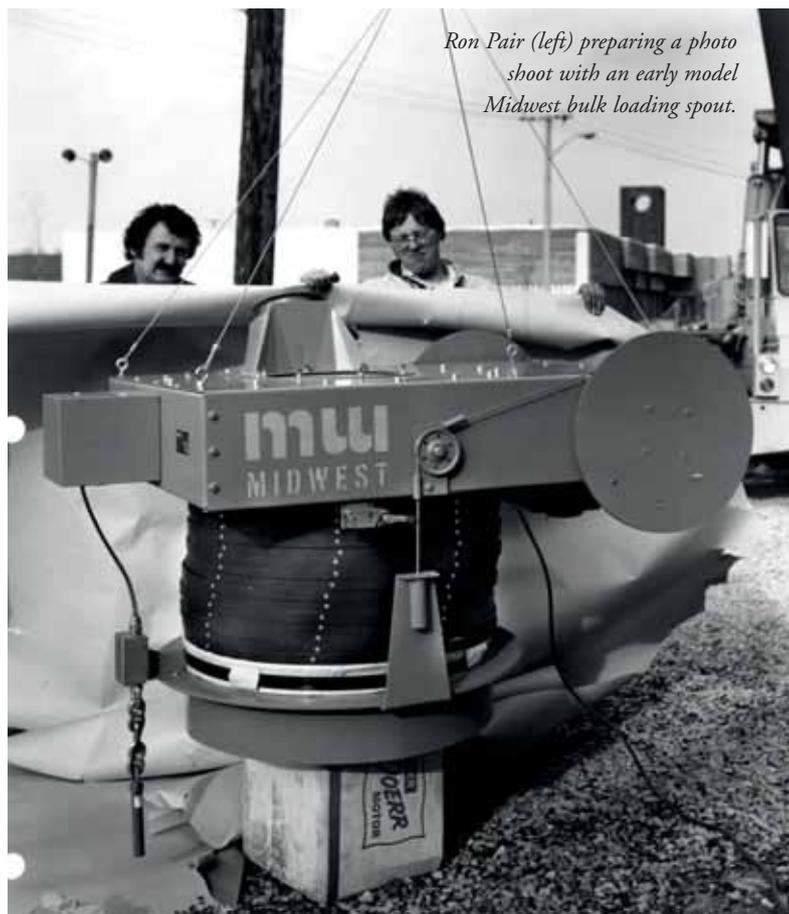
I didn't really know a whole lot about loading spouts back then, but the job would become my formal introduction. I guess it felt natural. After all, the loading spout industry was in my blood, and our family's legacy had been defined by it. Midwest was our family's patriarch. It was a rollercoaster, lifting us up when times were good and striking us down when times were bad. I remember driving up to Charlevoix for the first time with my mother, father and two sisters. It was sometime before my fourth birthday. Memories at that age are few and faint, but I recall being shoved into the back of our little white Dodge convertible, crammed between my sisters with my legs pressed against the red vinyl seat. We were moving to a small condominium at the Weathervane Terrace in Charlevoix.



One of the first Midwest bulk loading spouts installed at Medusa Cement in Detroit.

My father had just put our home up for sale in Grosse Pointe, Michigan. His company, Midwest International, which he founded in Detroit and moved to Charlevoix some years later, was going through a bankruptcy. The bankruptcy was a result of a whole host of problems; most recent was an embezzlement of the employee pension fund, which involved our company's vice president and business attorney at the time. The embezzlement landed the attorney into a state mental hospital before he was sentenced to three years in a federal prison. The vice president (and former IRS auditor) would emerge unscathed, but would later be convicted (alongside a former ace pitcher for the Detroit Tigers) of a two million dollar embezzlement from a meat packing company near Flint, Michigan. He was ultimately convicted to seven years in prison.

Interestingly, the bankruptcy that ensued would trigger a battle between the bankruptcy court, district court and court of appeals, regarding a tax loophole that emerged during the bankruptcy proceedings. The loophole would protect the bankrupted party against having to pay various taxes, fees and interest to the government. The case, which would have changed the bankruptcy law and tax code, was upheld in the Court of Appeals in favour of Ron Pair Enterprises (Midwest International). But the US Supreme Court filed suit against Ron Pair Enterprises, where the case was argued in Washington DC in front of the likes of William



Ron Pair (left) preparing a photo shoot with an early model Midwest bulk loading spout.

*** IN STOCK ***



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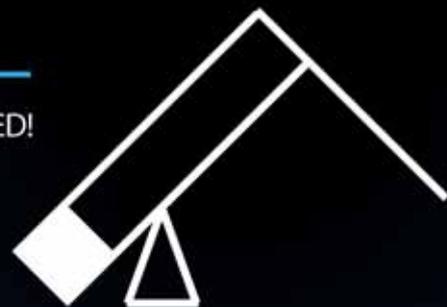
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Ron Pair (centre) inspecting an MI96 flexible outer spout while sporting some fashionable slacks during the early years of Midwest International.

Rehnquist and Sandra Day O'Connor. In the end, the Supreme Court would rule against Ron in a 5/4 decision, and the bankruptcy would enter chapter 11.

At a moment of time when things were at their worst, a few employees jumped ship to compete across town. The expectation by many was that Midwest was finished. It was an expectation that would prove wrong. Ron would pick Midwest up from out of the mud and forge ahead.

As environmental laws became more stringent, the market for dust-free loading equipment grew. The cross-town competitors that defected from Midwest would eventually spin-off their own set of detractors and competitors; a pattern that would repeat itself a few more times until the present day. Although some of those loading spout companies are no longer in business, today there remain several in Charlevoix County. Some have even dubbed the county 'The Loading Spout Mecca', though I would describe it better as a soap opera. One that we turned off a long time ago.

But what one can't turn off is the history of our industry and what ultimately brought us to Charlevoix.

Last December Midwest received a call from St. Marys Cement in Charlevoix. It was to replace the six loading spouts at their boat loading birth. It was a unique opportunity to bid a project in our hometown, but this project was particularly special because it involved replacing spouts my father manufactured 42 years prior. Midwest would ultimately be awarded the project, part of a major renovation St. Marys Cement had under way in upgrading its production, distribution and storage capabilities. But it meant more than that. It represented a generational gap in our industry. I took over Midwest from my father in 2010. A year later, he died. A big chunk of Midwest died with him. Having ridden the rollercoaster all those years, it was important for me to understand his legacy. The Charlevoix project represented that opportunity.

Over 40 years ago, Medusa Cement Company (now St. Marys Cement), alongside a host of equipment manufacturers, contractors, and consultants began orchestrating a network of high-speed cement terminals to meet the demand of an expanding cement market and compete with Huron Cement (now LafargeHolcim) which had dominated the Great Lakes region since 1908. This network would centre around a brand new cement plant in Charlevoix, Michigan and implement new high-speed loading/unloading technology. By the early 1970s, this vision became reality. In addition to the new plant in Charlevoix, Medusa constructed new silos in Milwaukee, Detroit, Manitowoc, and Cleveland. To make the network viable, Medusa converted an old but reliable steamship into a self-unloading cement carrier. The *Medusa Challenger* was born. Unlike Huron Cement's *J.B. Ford* carrier, the *Challenger* implemented a sophisticated high-speed unloading system highlighted by a first-of-its-kind vertical belt elevator developed by Webster Manufacturing. To complete the network, Medusa implemented new loading equipment at the Charlevoix plant. Fuller Bulk Handling (FL Smidth) installed shuttling airslide conveyors that could extend out over the *Medusa Challenger*. Attached to the end of the conveyors were newly designed bulk loading spouts by Ron Pair Enterprises (Midwest International) which allowed the high-speed loading of cement to be performed dust free. With the technologies in place, the new cement plant could offload its product onto the *Challenger* in just a matter of hours. The *Challenger* could then quickly unload at various terminals on the Great Lakes and swiftly return back to Charlevoix to receive another load. In 1972, cement distribution and transportation on the Great Lakes would be taken to unprecedented levels. Forty-two years later, the same spouts, same shuttling conveyors and same *Medusa Challenger*, were still chugging away.

That original project represented the old-school way of business, where companies were smaller, and built products



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because they believed in them. Companies would shake hands, roll up their sleeves and make the impossible possible. And if a company made a mistake, they would own up to it, and get it fixed. It seems a far cry from today's business environment, littered with 300-page contracts stipulated by liability rather than substance, where finger pointing becomes the first reaction when anything goes wrong.

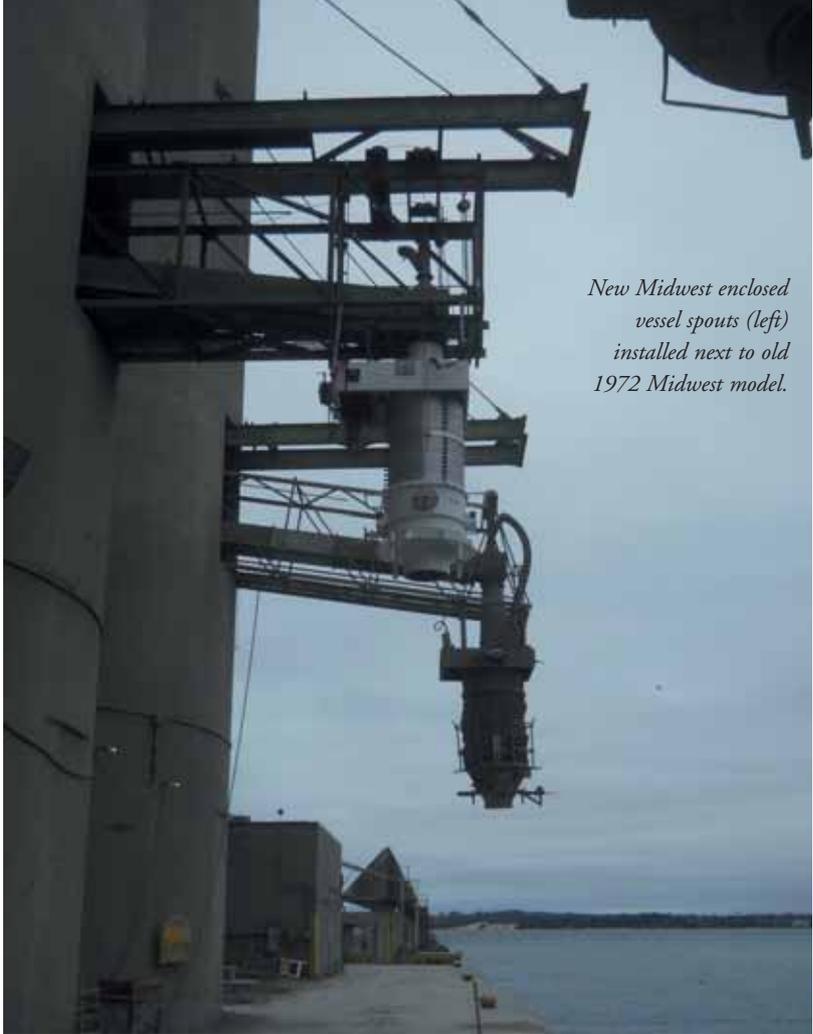
The new St. Marys Cement renovation in Charlevoix would make a connection to this earlier time, an older and arguably better generation. It would also signify the beginning of the bulk loading spout industry in Charlevoix, which stemmed from a relationship Midwest shared with Medusa in Detroit, Michigan.

In fact it started in the late 1960s on a cocktail napkin at Sinbad's Bar and Grill on the Detroit River. On that cocktail napkin, Ron and Hayes Jensen, an engineer from Medusa Cement designed what would later become the MC22 bulk loading spout, a much needed answer to the problematic dust emitted during the loading process; a problem that was worsening as silo withdrawal technologies were yielding higher loading capacities. The loading spout provided a standard approach to dust-free loading and would make all other loadout apparatuses at the time obsolete.

As Ron Pair Enterprises began manufacturing these dust free loading spouts for Medusa, Peerless, and Huron Cement in the Detroit area during the late 1960s and early 1970s, it was that grand project surrounding the Medusa Charlevoix plant that would help bring the bulk loading industry to Northern Michigan.

Today, as the renovation at St. Marys Cement takes effect, and the new Midwest spouts begin their next 40-year voyage, it's hard

not to appreciate the efforts of a past generation and their contributions to our industry. It's been a long time since my first days at Midwest, sitting in that dark little room, plugging away at books. But for a company that has been through the thick of it, and the family as well, we are ready, willing, and prepared for anything that comes our way.



New Midwest enclosed vessel spouts (left) installed next to old 1972 Midwest model.



Midwest spout #3 of 6 hoisted into place.



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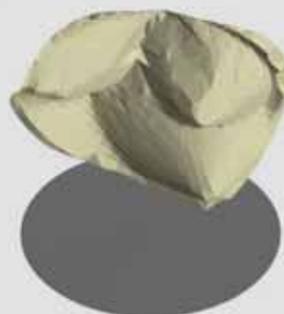
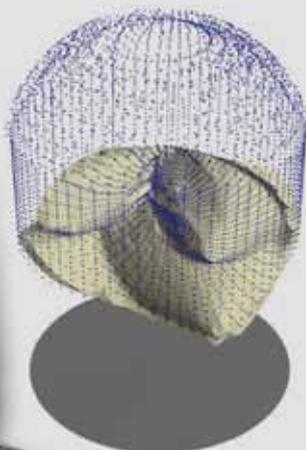


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Air cannons mitigate chute plugging at Texas cement plant

Two chutes offload up to 400tph (362.8 metric tonnes) onto the D-07 conveyor, which runs at 350FPM (1.8MPS).



Spring and summer in Central Texas (USA) bring unpredictable weather, and at times thunderstorms rage across the region, pounding the dry ground with so much water that parched riverbeds can suddenly become torrents in minutes, writes Don Papini, Martin Engineering Territory Manager. The warm seasons also bring humidity that averages more than 85%, which can make any bulk material containing clay or silica adhere to most surfaces.

This type of accumulation created problems for the Hunter Cement Plant in New Braunfels, Texas, which consistently fought against penetrating humidity and marble-sized raindrops dousing the material on its partially covered D-07 conveyor system. Terminating in a chute that acts as a major transfer point, the wet material would clog the shaft and result in backups on the belt, leading to spillage issues that halted production.

Martin Marietta took over plant operations in 2014, following a merger with Texas Industries (TXI), the largest cement producer in the state. Managerial inspections revealed that there were some improvements needed in the existing rotary feeder and chute system in order to reach continuous mill operation. Built in 1979, the facility had run on one kiln, producing 0.9mtpa (million tonnes) a year of cement. In 2012, TXI added a state-of-the-art second kiln, increasing the plant's production to a total of 2.3mt annually.

According to a management source, "The frequent unscheduled downtime to clear the rotary feeder chute was a challenge. We approached Martin Engineering to explore the possibility of installing the air cannons that could help resolve bottleneck issues."

DAMAGE AND RISK ASSESSMENT

Limestone extracted from Hunter's quarry eight miles away is protected from the weather in an enclosed 40,000-tonne on-site storage dome at the Hunter plant. There, it is crushed to a size of 6-inch minus (150mm) and mixed with clay, then conveyed to a processing tower. Separate conveyors deliver iron ore and sand to the same tower, where they are loaded onto a weight belt feeder system for precise measuring. Two chutes — one with limestone and clay, the other with iron ore and sand — offload 350 to 400 tonnes (317.5 to 362.8 metric tonnes) per hour onto the D-07 conveyor, mixing them together on the 42in. (1,068mm) single belt running at 350FPM (1.8MPS).

The conveyor travels approximately 300 feet (91.4m) to an adjacent tower and offloads into a pyramid-shaped funnel, which feeds a chute with a flow control gate at the bottom that either diverts material to a conveyor leading to the raw mill or to a dump truck waiting on the ground below. In the Quadrapol mill, the mixture is ground to the kiln feed specifications of the grade of product to be produced.

Once the material is offloaded from D-07 into the funnel, it drops 12 feet (3.65m) down a square 3ft by 3ft (0.91m) chute, onto the conveyor below. Operators found that wet or damp material gradually formed into a rat hole and eventually created an obstruction, which led to the material back-up.

"Blockages could take days to form with normal humidity, but when it rained, the chute would require more attention," said Jonathan Cole, Lead Service Technician for Martin Engineering assigned to the Hunter facility. "Once material backed up in the chute, the spillage and aggregate would also collect on the return

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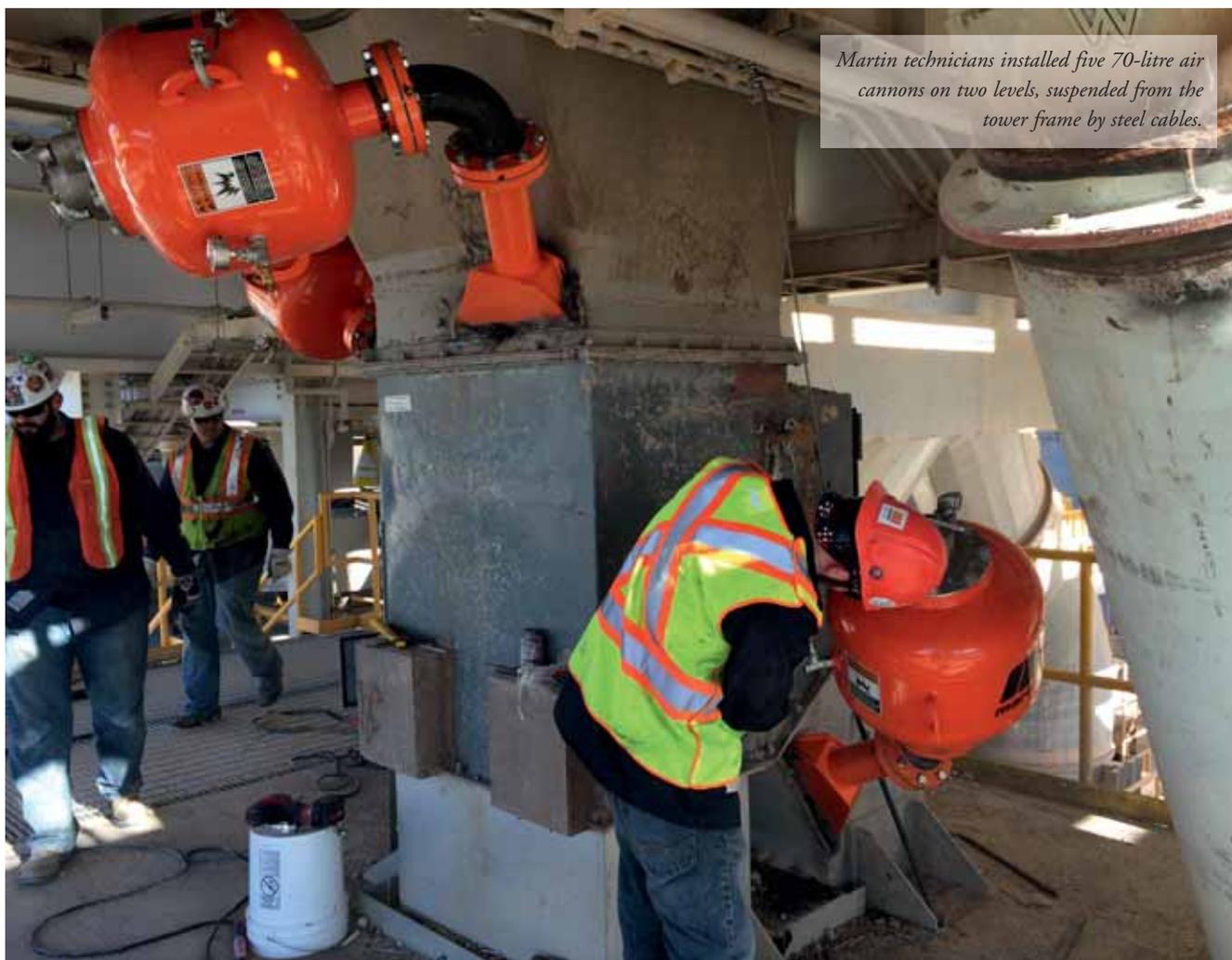
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Martin technicians installed five 70-litre air cannons on two levels, suspended from the tower frame by steel cables.

side of the belt. To address the problem, the raw mill would be shut down for six to eight hours at a time so that workers could clear the chute.”

Operators explained that two or three workers would gather around the railing at the top of the chute and use air lances and pneumatic jackhammers fitted with 8-foot long bits to clear the obstruction.

AIR CANNON PLACEMENT FOR PROPER FLOW

The Martin Engineering team and Martin Marietta management worked together to devise a solution using a series of Martin® Hurricane air cannons strategically placed along the chute. With more than 140 similar units already in place, aiding material flow throughout the facility, Martin Marietta decision-makers agreed with the conclusion.

“Once material stuck to the diverter gate and chute wall, it quickly collected upon itself, so our first priority was to prevent accumulation,” Cole said. “However, the higher the moisture content, the faster material adheres and the harder it is to blast off, so we also installed units that shot air at a 30° angle down the centre of the chute to always keep material flowing.”

Martin technicians installed a total of five 70-litre air cannons on two levels. The 94 lb (43kg) tanks are suspended from the tower frame by steel cords and are fed by the plant’s existing compressor line. The powerful cannons fire a shot of air at up to 120 PSI (8.27 BAR) from a pressurized tank through a fan jet nozzle with a 12 inch (305mm) wide mouth, which spreads the stream across the surface area of the wall. To clear obstructions and assure proper material flow, the cannon has an effective area of up to 22.6ft³ (641 L).

On the upper level, two of the cannons were placed along either side of the chute to dislodge accumulation from the wall, and a third unit was installed at the top to free any material that could get trapped where the chute narrows. One floor below, a cannon is directed at a downward angle to aid material flow, whereas the lowest unit on the chute specifically addresses the easily clogged diverter gate.

All fitted with a centrally located valve design, the tanks offer the most direct air path with the maximum force output and low air consumption. This efficiency reduces the burden on the compressor system and shortens the lag time between sequences. The central valve is a detachable piece that allows a single worker to disconnect it without the need to remove the tank, for faster and easier maintenance.

A ten-bank positive solenoid control panel — which can be located as far as 200 feet (60m) away from the tanks to avoid harsh conditions — is connected to the facility’s programmable logic control (PLC) software. It allows operators to control and monitor the proper firing time and sequence remotely from a central location. To eliminate the risk of unintentional firing due to drops in pressure, the valve requires a positive signal from the solenoid in the form of an air pulse to trigger discharge.

According to operators, installation only took a couple days and was scheduled with other projects that also required downtime. After some testing, a workable firing sequence that suited most weather conditions was implemented.

IMPROVING PRODUCTION AND SAFETY

A few months after the installation, operators report that the air cannon solution has significantly decreased the plugging issues,



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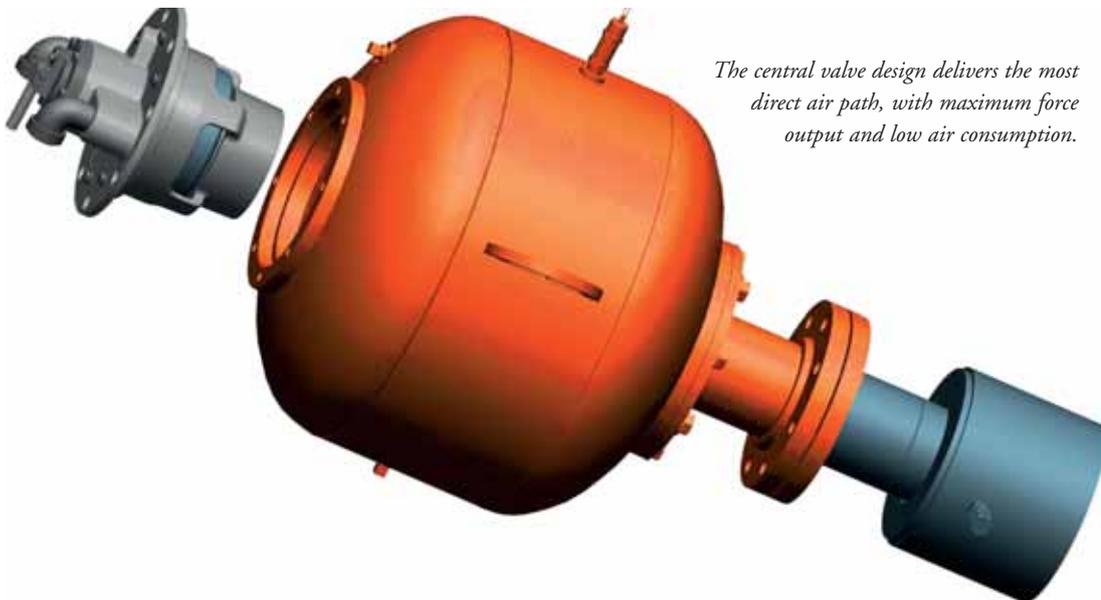
Forged Link Chains

resulting in continuous mill operations with minimal unscheduled downtime. Moreover, the area around the chute is reported to need only routine cleanup and maintenance accompanying normal scheduled inspections. Proven to be able to withstand the demands of the strong Texas

storms, the cannons are discharged when needed, increasing and decreasing in frequency with seasonal weather fluctuations.

“Due to our long and positive relationship, there was no doubt that the Martin team was going to come through with a good solution,” Martin Marietta management concluded. “The equipment has worked out well and with the team’s consistently attentive service, we are confident that this is a good solution.”

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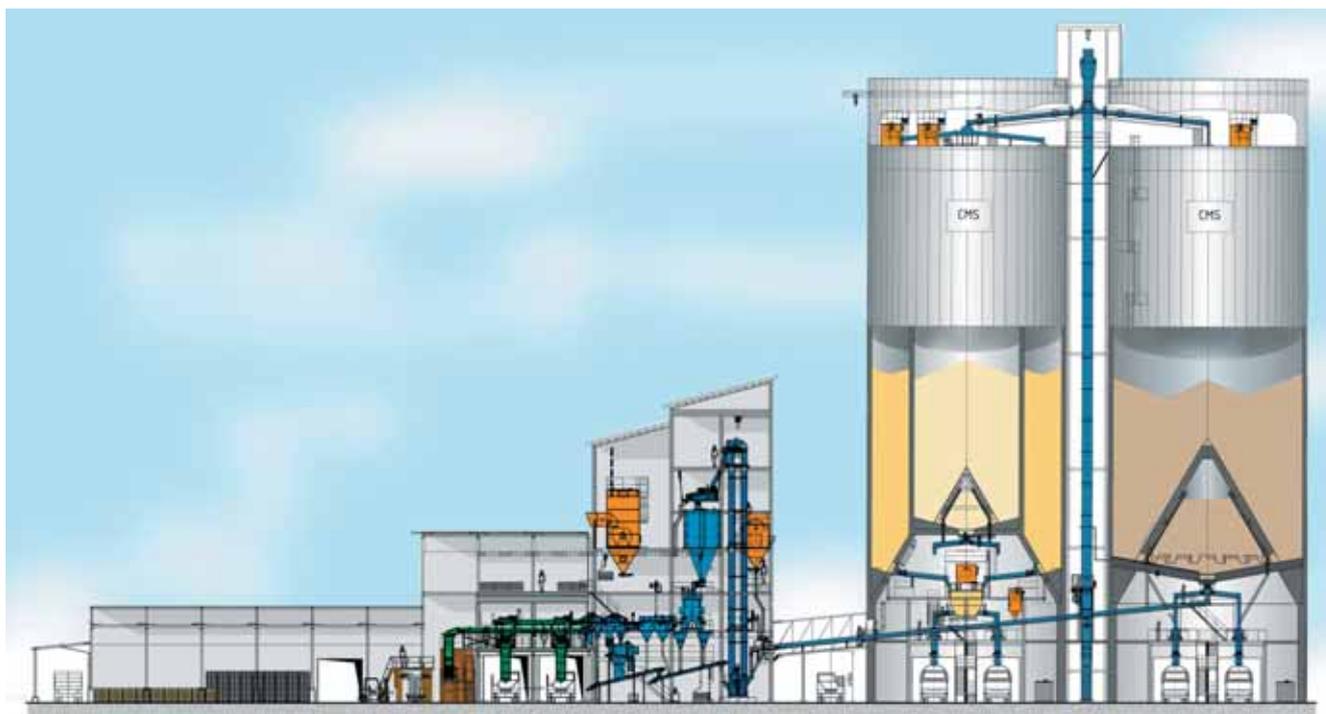
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BUCKET ELEVATORS

Claudius Peters reports on recent cement handling activity



NEW TECHNOLOGIES ENABLE 'COMPLETE PLANT' CAPABILITY

Claudius Peters has unveiled its new PACPAL range of packing technologies which provide a state-of-the-art packing capability for any plant, and which also enable the company to offer a complete end-to-end 'new plant' capability (see graphic, above). The high-performance modular PACPAL range comprises a Roto Fill, Bag Applicator, Inline Fill, Bag Loaders, Big Bag Fill and a choice of different palletizer units capable of layering up to 5,000 bags per hour, depending on bag and unit type. These products, designed to adapt to any conceivable plant configuration, combine low-maintenance and optimized energy consumption with high availability and easy, interactive operation, utilizing the most innovative design technology available today.

Claudius Peters sales and technology Director Stephan Oehme said: "As well as promising significant new productivity benefits for our customers, these new technologies allow us to offer complete plant solutions, further underlining Claudius Peters' reputation as the world leader in its industry."

REPLACEMENT ETA COOLER CONTINUES TO DELIVER BENEFITS FOR LA UNION IN PHILIPPINES

A decision in 2011 to install a new Claudius Peters ETA Cooler in Holcim's 20 year-old plant at La Union in Northwest Philippines, continues to deliver multiple efficiency benefits for the plant today.

Cooler-related kiln stops created by the plant's existing cooler had created a bottleneck resulting in around ten days per year of cooler-related stops. Instead of reconditioning the cooler, the decision was taken to install a new Claudius Peters ETA Cooler.

This delivered immediate improvement in all operational parameters, including reduced fuel costs, increased cooler availability and a significant reduction in maintenance costs.

Commenting on the benefits that this decision was still bringing to the La Union plant, Andre Vos, Claudius Peters sales manager said: "This installation is an ongoing success story at Holcim's plant at La Union. The combination of a simple aeration concept, controlled side aeration, independent lane movement



Claudius Peters ETA Cooler lane after nine years of operation.

and high clinker bed make the ETA Cooler's process unbeatable. Low-cost modification of an old cooler may seem to be the most economical option, but the ETA cooler has brought much better results long term."

LATEST GENERATION PACKING AND STORAGE FOR NEW GRINDING PLANT, MALAYSIA

Claudius Peters is to provide bulk and bagged cement storage, packing and dispatch facilities for a new grinding plant currently





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Rio Tinto Alcan



being built by CMS Clinker Sdn Bhd in the state of Sarawak, Malaysia. The grinding station will store cement in two Claudius Peters Expansion Chamber silos, with their 'first in, first out' design providing guaranteed reclaim rates of over 98%.

The Claudius Peters PACPAL Roto Fill, with its latest generation integrated and independent weighing system, will act as the heart of the packing plant, delivering a rate of 3,000 50kg bags per hour. The Roto Fill features advanced de-dusting technology, with dust diversion occurring directly at the filling spout.

The dispatch facility incorporates the Claudius Peters fully automated palletizing system and the Claudius Peters PACPAL Big Bag Fill and flow control gate achieving a weighing accuracy to exacting OIML standards.

The facilities are expected to be commissioned in the second half of 2015 and from 2016 on, the grinding facility will be able to supply the growing Sarawak market for the next decade. Commenting on his company's partnership in the development of the new plant Stephan Oehme Sales Director of Claudius Peters said:

"Our storage, packing and dispatch systems are the ideal technologies for this CMS state-of-the-art grinding plant. Projects like this are enabling us to set new industry benchmarks for cost and output efficiency."

CMS Clinker Sarawak is a leading clinker manufacturer and trader and is wholly owned by CMS Cement Sdn Bhd, part of the Cahya Mata Sarawak Group. The new CMS grinding plant is the third grinding plant for the CMS Group.

DemcoTECH meets the challenges of a hard-to-handle material

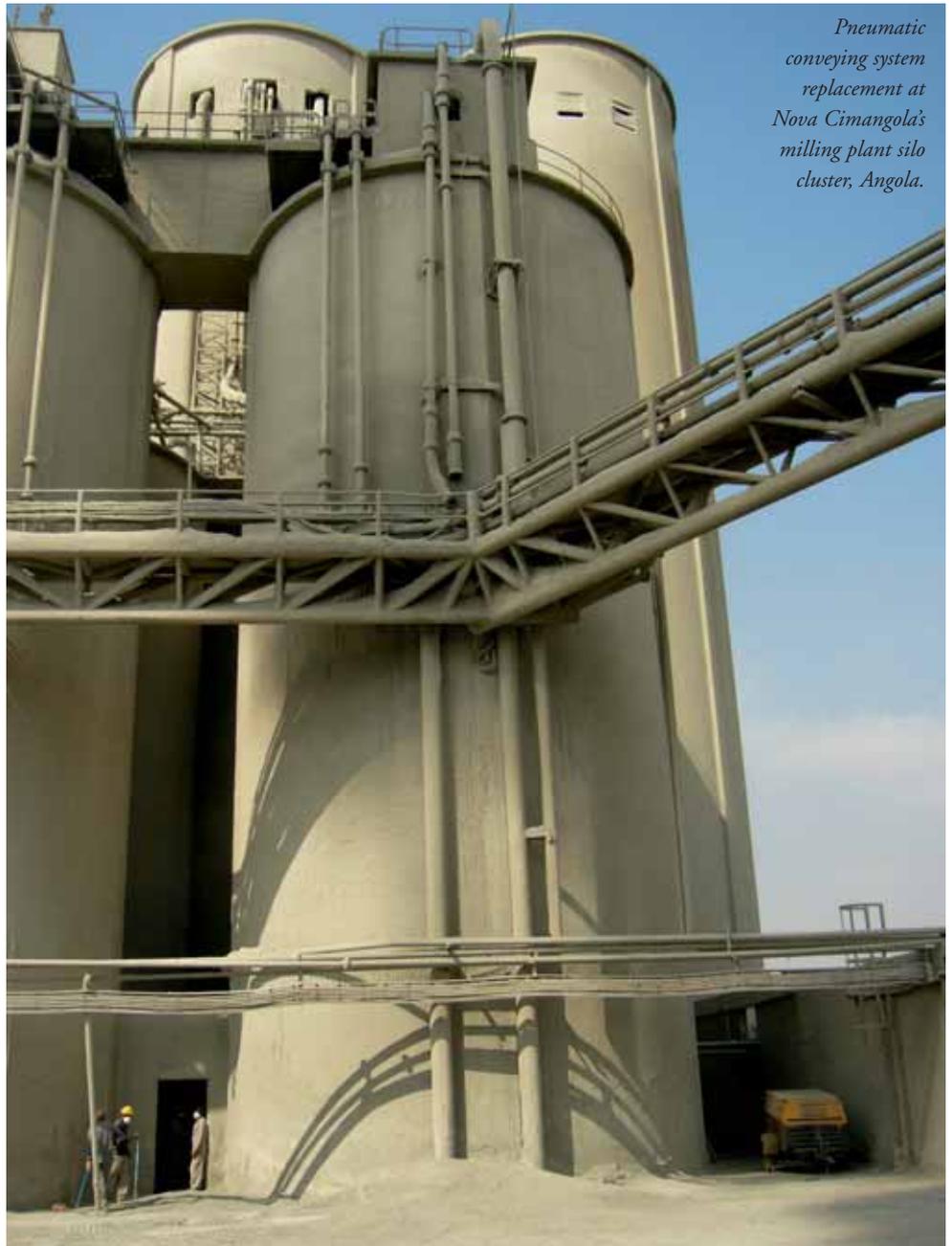
While the many benefits of cement have made it a huge global business, it remains a difficult material to handle, in terms of both its potential to pollute the environment and being a very bulky material to transport, says Paul van de Vyver, General Manager of DemcoTECH Engineering.

"This is why," notes van de Vyver, "we see cement producers choosing to locate their plants close to the source of their vital raw material and to their customers, and seeking out engineering houses with specialist expertise in efficient and environmentally friendly technologies suited to the specific needs of the industry.

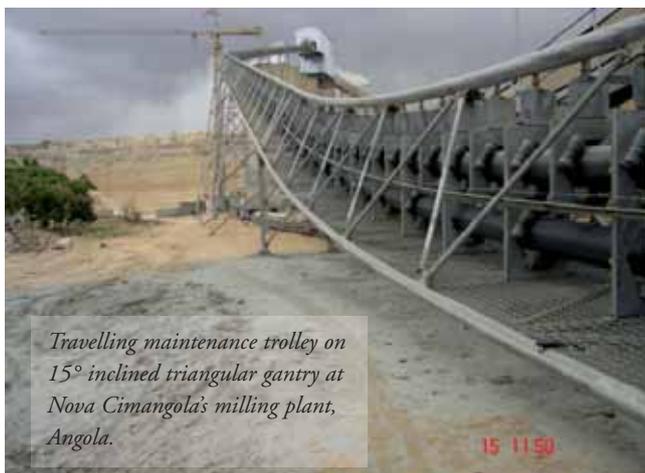
"As a leader in the bulk materials handling field, we work with other leading consultants in the cement industry to offer a range of services from conveyor design to the design and construction of cement and clinker silos, controlled extraction and transport systems, offloading of road tankers and complete ash handling plants.

"All the materials handling systems we design and supply comply with environmental and safety requirements, drawing on our specialist expertise in dust control and suppression systems."

For example, at NPC Cimpor's Simuma Plant, DemcoTECH, working in joint venture with Kantey & Templar Engineers of South Africa, designed and installed the new clinker silo with associated materials handling plant. This facility is



Pneumatic conveying system replacement at Nova Cimangola's milling plant silo cluster, Angola.



Travelling maintenance trolley on 15° inclined triangular gantry at Nova Cimangola's milling plant, Angola.

located alongside its raw material source, limestone, in the Oribi Gorge area of South Africa's KwaZulu-Natal province.

"Environmental considerations were therefore of paramount importance in designing the silo for Simuma so as not to impact negatively on this very scenic and eco-sensitive part of KwaZulu-Natal," says van de Vyver.

"The design as a result ensures that dust emissions from the plant are controlled well below regulatory health and safety requirements," says van de Vyver. "For example, dust extraction filters are included on the silo and at all the transfer points."

Other challenges included the need to complete this fast track turnkey project within 15 months as well as to design a materials handling system that can handle clinker at temperatures over 200 °C, with the versatility to feed clinker to either the existing or the new silo.

Kantey & Templar was responsible for the civil and structural design, engineering and project execution of the 40,000-tonne multi-discharge clinker silo, while DemcoTECH supplied the materials handling expertise to the project — from the

mechanical and electrical design, through to the engineering and project execution of the system.

Positioned alongside the existing silo, the new silo consists of a 40,000-tonne free capacity, reinforced, prestressed structure with a 30m internal diameter and 55m height. The clinker silo has two reclaiming tunnels and a precast concrete conical roof.

The silo is founded on a full raft foundation, 36m in diameter and 1.3m thick. This raft is in turn founded on an engineered fill layer, which extends 4m below the natural ground level.

The silo receives clinker from the kiln at temperatures up to 205°C, via a silo feed Aumund steel pan conveyor. Two DemcoTECH-designed reclaim belts with heat resistant belting extract the clinker to feed the existing plant or rail loading system. The silo discharges at 250tph (tonnes per hour) onto each of the two reclaim conveyor belts.

The new silo was part of an expansion drive by NPC-Cimpor, which included a new, second cement kiln, requiring an additional silo for storage of the increased clinker production.

MATERIALS HANDLING EXPERTISE

Johannesburg-based DemcoTECH Engineering is an acknowledged leader, both locally and internationally, in materials handling systems for the cement and other industries. The comprehensive suite includes specialized pneumatic, air-assisted, troughed AeroConveyor™ and pipe conveyor systems to provide totally enclosed, environmentally friendly handling.

The DemcoTECH pipe conveyor technology, comprising both fabric and steel cord belting, and with up to 2,250tph conveying capacity, can be designed using a triangular tubular gantry fitted with a mobile maintenance trolley.

“At NOVA Cimangola’s Luanda, Angola plant, for example, we supplied two maintenance trolleys for the pipe conveyors, which had to negotiate an incline of up to 15° while carrying four personnel together with spares and tools.”

The trolleys were manufactured and pre-tested in South Africa at a 16° inclination, before being containerized for transport to

Example of a DemcoTECH mobile maintenance trolley fitted via a triangular tubular gantry to a pipe conveyor.



site. The trolleys are self-propelled by an on-board generator and include hydraulically driven travel mechanisms for a high level of control. The trolley designs include a number of safety features such as fully enclosed access facilities, emergency brake systems and heavy duty traction control.

Working in conjunction with Claudius Peters in Germany, DemcoTECH also supplied a 150tph pneumatic transport system to convey cement from a kiln to multiple storage silos at the cement plant.

PIPE CONVEYING

Loaded, the pipe conveyors’ open belt is formed into a tubular shape as it passes through transition idlers, giving it its customary ‘pipe conveyor’ name.

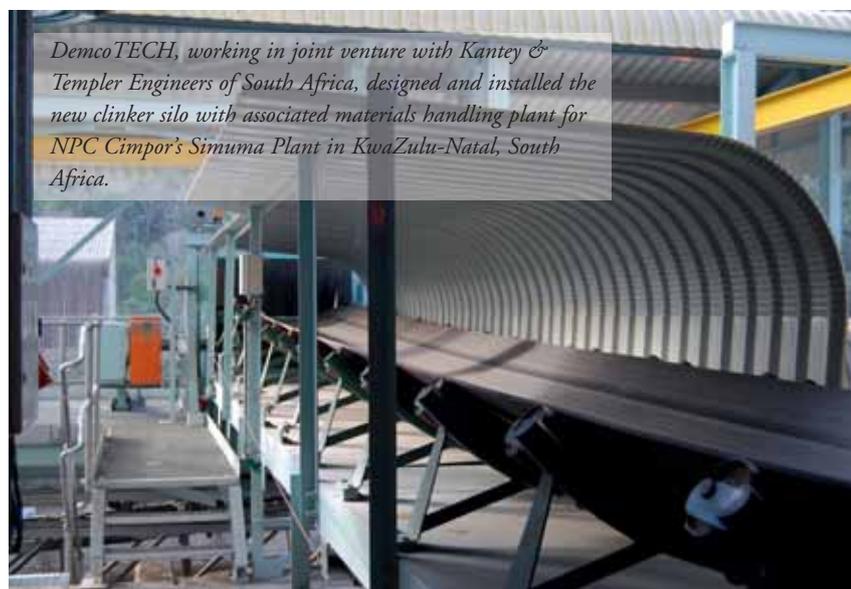
This ‘pipe’ shape is retained along the full length of the conveyor and enables the conveyor to be curved through vertical and horizontal curves that are far tighter than is possible with troughed conveyors, while at the same time retaining the high-capacity, long-distance conveying capability of troughed conveyors.

At the terminal point the belt opens up for material to be discharged in the same way a troughed conveyor is discharged.

On the return-side, the belt is also formed into a ‘pipe’ shape and can be used to transport material in the opposite direction, with significant cost advantages. With the exception of the specialized belt carcass design, DemcoTECH’s pipe conveyors, with diameters of up to 500mm, make use of readily-available conventional conveyor components.

“We also engineer two-way pipe conveyors, multiple curve pipe conveyors and distributed drive pipe conveyors,” says van de Vyver.

“Pipe conveyors are ideally suited to the cement industry, offering opportunities to reduce the number of conveyor flights, eliminate transfer points, minimize spillage and dust generation, reduce the conveying distance and save total costs, while at the same time addressing the environmental requirements.”



DemcoTECH, working in joint venture with Kantey & Templer Engineers of South Africa, designed and installed the new clinker silo with associated materials handling plant for NPC Cimpor’s Simuma Plant in KwaZulu-Natal, South Africa.

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Hycontrol ensures essential silo safety for Sika

Integrated SPS Silo Protection Systems, installed and commissioned by Hycontrol, are ensuring global sealant and adhesive specialist Sika meets the latest MPA (Mineral Products Association) safety guidelines. The new over-pressurization systems have been installed on nine 50-tonne capacity silos at its UK headquarters in Welwyn Garden City, three containing cement and six containing sand.

Sika had become concerned that the existing protection systems fell short of the MPA guidelines and asked Hycontrol to carry out a thorough survey of the silos so that updated instrumentation could be installed. Hycontrol has extensive experience in the design and installation of compliant silo protection systems and its engineers found evidence that product had been leaking from the pressure relief valves at the top of the silos, clearly showing that all was not well. The survey revealed that the silos were fitted with their original outdated hinged-door pressure relief valves (PRVs) and the high-level alarms (HLAs) were provided by aging paddle switches. In addition there was no pressure monitoring instrumentation or auto-shut off systems to halt the filling

Silo pressure was becoming a concern for Sika.



process if pressure or product level in the silo exceeded safe levels.

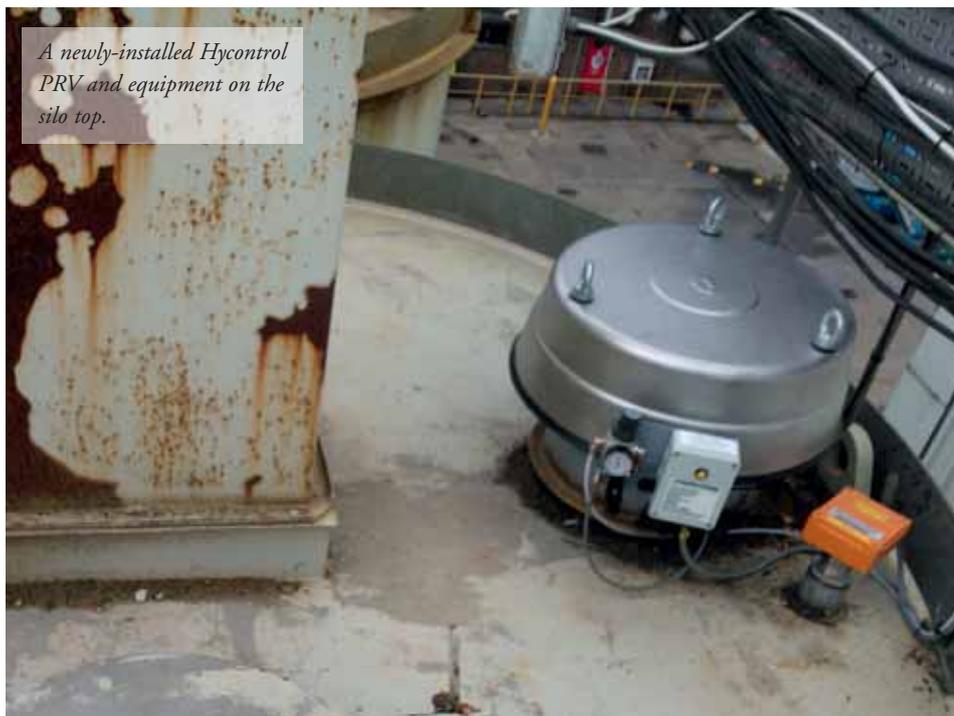
MPA guidelines for silo protection systems recommend that silos should be fitted with three essential components: a pressure relief valve, suitably sized for the application; an effective high level alarm device, programmed to allow sufficient ullage above the final product level; and an auto shut off system that halts the filling process should the level in the silo exceed safe levels. Hycontrol's SPS sets the benchmark for effective silo protection. In addition to meeting the MPA requirements, the system also includes an integrated pressure sensor and a Ground Level

Testing (GLT) feature, the latter allowing operators to test all key components including the PRV before each and every fill.

For Sika's application, Hycontrol's final recommendation was for nine complete SPS Silo Protection Systems. Each one incorporates the company's latest pressure relief valve, a self-cleaning DPI150 Diamond Point vibrating probe on a 1m-long cable providing the HLA, a FLEX501-D pressure sensor and a bespoke alarm panel with GLT capabilities and auto shut off.

Hycontrol's MD Nigel Allen is clear on the importance of effective silo protection: "Silo protection systems sit on top of silos often 'out of sight out of mind' and are expected to work if there is a problem. Even if regular visual inspections are carried out,

A newly-installed Hycontrol PRV and equipment on the silo top.



our experience shows that these cannot necessarily determine whether key components such as the PRV will work when required. Our GLT capability carries out a quick, effective test in a few seconds and only when the system has passed can the interlock be opened to commence the filling process in a safe and secure manner.”

Sika’s Engineering and Facilities Manager Nick Luxemburg is very pleased with the new installation: “We take site safety very seriously and had recognized that the existing silo protection systems needed upgrading. The complete installation has been carried out with minimum plant disruption, with Hycontrol engineers working closely with our in-house staff. The SPS systems exceed MPA guidelines and we can rest assured that the silo filling process can be carried out safely and expediently. Following on from this installation we have had no hesitation in ordering similar systems for our two new silos.”



Three of the SPS control panels with GLT function.

SIKA

Sika is a speciality chemical company headquartered in Baar, Switzerland and manufactures and supplies products for bonding, sealing, damp proofing, reinforcing and protecting in the building marine and automotive sectors. Sika has subsidiaries in 89 countries around the world and manufactures in over 160 factories. Worldwide, the company boasts over 16,000 employees.



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The SENNEBOGEN 880 EQ at the Port of Mersin primarily handles plaster, bauxite, cement clinker and coal — at rates of up to 1,500tph.

The Mediterranean Port of Mersin in Turkey is taking an unconventional path — with great success. Stevedoring company AHTAPOT Denizcilik handles a variety of scrap for the proprietors of the port using the latest in material handling technology as well as young women to operate the machines. Rehandling capacity is greater than before, and the work climate is continuously improving.

Zübeyde Pamuk controls the joysticks in the Mastercab with

confidence and calm. She is seated 14m above the trucks that continuously deliver bauxite and dump it into containers. She expertly grabs the material and loads it into the 60,000dwt hull of the *Julia Oldendorff*. In less than a minute, she has finished and signals to the next driver that she needs material faster. The truck driver picks up the pace, since opposing Pamuk is not something he likes to do. A woman who can confidently move a 250-tonne excavator has his respect.



With a range of 35m and a cab height of up to 14m, the SENNEBOGEN 880 EQ services 60,000dwt ships with ease.

UP TO 1,500TPH

The large, green material handler is her favourite machine. It is a SENNEBOGEN 880 EQ with an enormous operating range. A range of 35m and the equipment kinematics allow her to transport scrap to ships such as the *Julia Oldendorff*. Today, it is bauxite, but with the right grapples, Pamuk and her colleagues handle coal, plaster, grains, wood chips or cement clinker. With the machine, she reaches a handling capacity of 1,500tph (tonnes per hour), reports Erkan Dogan, managing director of Ahtapot. That is more than many men have accomplished.

When asked whether or not that made women better operators, Dogan counters that she is not necessarily better, she

just works differently. She operates the machine in a more conservative way and is also interested in maintenance and servicing. If servicing takes too long, she wants to know why. "That's something the men don't do, and we think it's good that the women identify so strongly with their machines," lauded Dogan. The bottom line is that Pamuk and her female colleagues can do a man's job without difficulty, something that, not too long ago, was not commonplace in many regions of the world.

"We need women in these jobs for a lot of reasons. We have grown a lot since our founding in 1999 and now have 1,500 employees. We can't fall into stereotypes, rather we need well-qualified and motivated employees of both genders," added Dogan.

Zübeyde Pamuk at work in the Mastercab of the 880 EQ. As a fast and delicate operator of the rehandling excavator, she has been fully accepted by her male colleagues.



Zübeyde with a perfect view of grapple, loading hatch, and cargo from the Mastercab of the 880 EQ.



Pamuk feels most at home up in the machine. “In the beginning, it was like at Universal Studios — the size of the machine seemed unreal. I’ve never operated such a large material handler before.” Since then, the giant machine has become a normal part of life and she would rather have no other job. Inside the pleasantly air-conditioned comfort cab, she has both a comfortable work space and an important job in port handling.

MATERIAL HANDLER FASTER THAN PORT CRANE

What I wanted to know is what is different now than when working with rope machines in the past. She considers the port cranes with rope grapples to be too slow, meaning at best she can achieve only half the handling quantity. She is very satisfied with the hydraulic 880 EQ, since it is both fast and quiet, thanks to the electric drive. She uses the Powerpack on the undercarriage, which provides the machine with power, to take the machine in for servicing.

I asked Dogan why the 880 EQ was chosen. “We were promised that our operating costs would be cut virtually in half, and handling capacity considerably increased. And we got both. The machine needs very little maintenance and servicing, thanks to the electric drive. Looking back, today we can say that it was the right decision. The material handler is very

reliable and economical,” confirmed Dogan.

“We also receive first-rate support from FORSEN, the SENNEBOGEN sales and service partner in Istanbul, whose employees stand behind the machine, its design, and our company. That is the best guarantee of good service.”

After eight hours of work, Pamuk climbs down from her machine. She performs a quick check to make sure everything is in order, since she’ll be handing the machine over to one of her colleagues on the next shift, Hüziin, Pinar, Bengü or Sena. But she is looking forward to tomorrow, since she enjoys working at the Port of Mersin. DCi

Zübeyde and her colleagues, Hüziin, Pinar and Bengü. Successful girl power in Turkey, an elegant and very modern form of emancipation.



New mobile odour control technology

from atomized mist innovator



The OB-60 is mounted on a towable roadworthy trailer fitted with a 500-gallon water tank.

A renowned global provider of atomized mist technology has announced the next evolution in odour suppression, introducing a new line of mobile equipment specifically engineered to disperse airborne treatments to manage large areas such as landfills, waste treatment facilities, livestock operations, paper mills and even marijuana growers — essentially any large-scale operation that generates undesirable odour. The OdorBoss® 60G (OB-60G) by Dust Control Technology® (DCT) uses a specially engineered mist that distributes odour treatment agents over great distances using water vapour as the delivery vehicle. A powerful fan generates wind movement, propelling the treatment into the air where it can attach to odour vapour. The result is a dramatic reduction in both short- and long-range odour emissions, helping companies remain compliant with environmental regulations and maintain good neighbour relations.

Inspired by the company's core line of industrial fan-driven dust suppression products, the OB-60G has been designed to deliver a finer mist that is better suited to optimum odour control. "It just made sense," explained DCT President Laura Stiverson. "We already had these industrial-strength, extremely durable designs that are very effective at suppressing dust. And both dust suppression and odour control are based on similar principles of matching the droplet size to its target. The closer the water droplet size is to the size of the targeted vapour droplets, the more likely there will be a collision between the two, which is the basis for dust and odour management with atomized mist."

Driven by customer demand for a better odour control solution, the company to begin working on a new design. "The

water flow and droplet size were optimized for odour suppression," Stiverson said. "We also knew that we needed compressed air to create a vapour with extremely small droplets, rather than a conventional mist."

Stiverson stressed that most odour suppression techniques can be seen as mainly passive measures. They are typically static methods of controlling odour, such as perimeter misting systems intended to form a barrier to prevent odour-causing vapour from escaping. In contrast, the OB-60 is a more aggressive, active approach, a mobile unit that can cover large areas of odour-causing material. It dispenses highly-effective air treatment chemicals, such as the OB line of deodorizers, which can hang suspended in the air for long periods of time as they attract and counteract odour-causing molecules. At the same time, the OB-60G can also be used as a powerful perimeter barrier.

The key for many operations is the versatility of the OB-60G, which can be quickly repositioned on its trailer to accommodate changing work locations or shifting wind patterns. That easy mobility is one of the features setting it apart from other misting systems. The design can also be set for specific oscillation arcs and aimed precisely at odour-causing substrates.

"Some customers have dispensed with their previous odour control methods after trying out the OdorBoss," Stiverson observed. "Others have found that it can complement existing technologies as part of a comprehensive odour control plan for their sites. In either case, we have designed what I believe to be the most effective airborne odour control system currently on the market."



The open-ended barrel design features a powerful fan on one end and the nozzle on the other.

DESIGNING FOR ODOUR CONTROL

The system creates an engineered fog comprised of millions of tiny chemically-enhanced droplets as small as 15 microns in diameter (approximately twice the size of a human red blood cell), which is required to effectively distribute the chemical into the air. Delivered by a special open-ended barrel design containing a powerful fan on one end and the Odor X Atomizer nozzle on the other, the device is mounted on a towable roadworthy trailer that is also fitted with a 500-gallon (1,893-litre) water tank.

Designed to be moved and adjusted with changing conditions by a standard pickup truck or small skid steer, the low-maintenance unit runs for 16 hours on a single tank under normal operating conditions.

The fine fog produced by the atomizing nozzle is propelled by a 25 horsepower fan generating 30,000ft³ per minute (152.4m³/sec) of air flow. Using the standard 359° built-in electric oscillator delivers extremely wide dispersal. Also featuring a vertical adjustment between 0–50° for expanded reach and precision aiming, the entire unit is controlled by a touch screen panel housed in a protective NEMA 3R cabinet.

When using the OB line of deodorizers, DCT recommends starting with a 100:1 water to chemical ratio and adjusting as necessary, with only 5 gallons (19 litres) of concentrated chemical additive needed to cover an 8-hour period, meaning workers only need to fill the tank once per shift at a usage rate of just 0.5 to 0.75 gallons of water per minute.

“With the low water volume,

our environmentally-friendly additives and a low cost of operation, we anticipate this will become an industry standard,” Stiverson concluded.

For over a decade, Dust Control Technology has manufactured atomized mist technology that has innovated dust and odour suppression for applications in waste and scrap handling, recycling, demolition and landfills. Headquartered in Peoria, IL (USA), the company supplies its dust and odour control units to customers around the world. All of the firm’s R&D, experience and expertise are centred completely on those applications. The knowledgeable staff helps customers analyse particle sizes, working environments and other factors to ensure effective performance under real-world conditions. DCT equipment carries the industry’s longest warranty, and can be purchased outright or rented from an extensive fleet of dust and odour suppression equipment.

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The Odor X Atomizer nozzle creates droplets as small as 15 microns to effectively distribute the deodorizing chemical.



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Italian equipment in focus



Jay Venter

SIG – rubber conveyor and belt elevator belts made in Italy

SIG is an Italian producer of rubber conveyors and elevator belts, and is active all around Europe.

With more than 50 years of manufacturing experience, SIG supplies worldwide high quality rubber belts, with synthetic and steel cord carcass, in all the industrial fields where the handling of bulk solid materials is required. Specific rubber covers are available to safely and efficiently handle the most difficult-to-handle bulk materials like hot clinker, flammable coal, oily waste and fertilizers, highly abrasive bauxite and iron ore.

Highly specialized technicians are also available to assure

assistance for belt and elevator installation, with the supply of all required products like splicing materials and clamping devices for elevator belts.

SIG also produces special technical articles, including in particular tracks for snow mobile machines.

Since the end of the 1960s, the production has been exclusively located in Gorla Minore (Varese), Northern Italy, close to Malpensa Airport and Milan city centre, in an integrated site of about 12,000m². All the company key positions, such as managing direction, sales, purchasing, account, R&D are





Technology to feed a growing world

Technology as an integration of manufacturing know-how with the expertise in evaluating the quality of the finished product. Technology as a result of the integration and

co-operation of a group of companies that are now fully integrated and synergistic, covering the entire supply chain from cereals delivery to the packed product on the shelf.

Technology allowing to set up in strict co-operation with our customers a manufacturing system tailored to their specific needs. Technology to feed a constantly evolving world.

concentrated in a synergic team. This company organization allows a real flexible approach to the business, making fast and easy the decision process and the reaction to the customers' needs. SIG's technicians are in daily contact with customers to analyse criticisms and find the most profitable solutions.

The flexibility in the company organization also extends to the production process: with a capacity of 350km and 5,000 tonnes per year, SIG develops conveyor belts of all sizes, up to 2,200mm of width and 25 tonnes of weight per single roll, length and typology, covering all the industrial fields like cement and iron factories, power stations, ports and terminals, quarries and mines, chemical industries. To optimize customer requirements, reduce freight costs and save time for belt installation, SIG is also able to deliver rolls in oval shape.

RUBBER BELTS CATEGORIES:

- ❖ TEXTER with EP textile insertions;
- ❖ SIDERFLEX with steel cord carcass;
- ❖ ARABELT, PIPEX/PIFLEX, SLIDEM;
- ❖ RIPSARE with special carcass; and
- ❖ TEXTBIND, SPINATEX, FLEXOBORD for high inclination purposes

RUBBER COVERS FOR CONVEYOR BELTS:

- ❖ abrasion resistant;
- ❖ for materials with temperature up to 200°C (390 °F);
- ❖ oil, fat and chemicals resistant; and
- ❖ self-extinguishing and antistatic as per ISO 340 & ISO 284.

RUBBER BELTS FOR BUCKET ELEVATOR:

- ❖ ELEMET with steel carcass;
- ❖ ELETTEX with textile carcass;
- ❖ Elevator belts can be punched according to customers' instructions;
- ❖ special rubber compounds for high temperature, up to 200°C; and
- ❖ all rubber covers are antistatic as per ISO 284.

The supply chain is composed of only qualified European converters of rubber compounds, synthetic fabric and steel carcasses to assure the highest level of quality with the fastest and most flexible delivery time.

Product quality is managed according to codified quality control programmes throughout the whole production process, from raw material acceptance to delivery of final product. For this purpose and to allow efficient R&D processes too, SIG has, during the years, made important investments for the development of its own technological laboratory, which is equipped with the most advanced and reliable equipment. SIG's laboratory is also available for customers' needs.

Together with strict control of production quality, SIG pays close attention to the environmental and health properties of the raw materials involved: since 2012. It follows the European directives for tyre products — all rubber compounds used by SIG are free from hazardous chemicals, in particular PAHs, PolyAromatic Hydrocarbons — resulting in a limited and lower impact on the environment and to the health of operators than imported products of unknown origin.

WE MANUFACTURE IN ITALY TO SUPPLY ALL AROUND THE WORLD



**CONVEYOR & ELEVATOR BELTS
STEEL CORD & TEXTILE**

ISO 9001



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STM: Italian expertise to handle bulk materials

The Italian company STM specializes in the engineering and supply of belt conveyor systems for bulk materials handling facilities. Since 1975, when it was set up as a family business, STM has provided worldwide innovative integrated solutions in order to increase efficiency, reliability and cost savings for the customers' production process.

STM offers its customers a full range of project services: engineering, fabrication, commissioning and carries out every step by developing flexible, individual and effective solutions. Therefore, STM succeeds in creating equipment of any size and complexity, which fully meets its customers' needs.

The whole supply process, from feasibility studies to final delivery and commissioning, is completely implemented in STM's factory, which is located at the company's headquarters in Tito Scalo (Potenza).

Thanks to an efficient and experienced Engineering Department, STM is capable of optimizing the design, the industrialization time and the information exchange with its clients. In-house engineers and designers use cutting edge tools and advanced designing and calculation software. Moreover the competencies of the employers are continually enhanced so they are able to develop complete projects from general lay-out proposals up to shop-drawings, with all necessary calculations to satisfy any requests.

Over the years, STM has gained a deep knowledge and expertise operating in many fields, with specific and innovative solutions for each applications: mining conveyors, RCC (roller compacted concrete) conveyors, tunnelling conveyors, crushing plants conveyors, batching plant conveyors and waste to energy plant conveyors.

COAL HANDLING: FROM MINES TO POWER STATIONS

In the case of the conveyors used in the mines, they are required to have a specific configuration to follow the development of the excavation site. STM's systems can expedite, optimize and



economize the process of overburden removal, redistribution and stacking. The conveyors for this application are designed for long lifetimes and for minimizing extraordinary maintenance and downtime risk. In fact, STM is committed to delivering high-value performance and to meet customers' needs for excellent reliability, investment costs, delivery times, lower operating costs, and high standards of safety and sustainability. Thanks to its flexibility and the long experience in this field, STM succeeds in creating and managing equipment of any size and complexity, including mobile plants. This configuration satisfies the plant owner who wants to have freedom to move the plant after limited time usage in the determined area.

It is necessary to have an efficient system of coal handling in thermal power generation plants as well, the most conventional source of electric power. Conventional plants produce electricity by burning fossil fuels, such as coal, in order to have pressurized high temperature steam and to use it to rotate a turbine, with electricity production as result. Handling those kinds of materials in a complex power plant requires the design

of a system with exceptional reliability in order to avoid any kind of shutdown for tens of years. STM is able to provide a complete engineering solution, including specific back-up solutions, limited maintenance devices and best-in-class components manufacturers.

INNOVATIVE SOLUTIONS FOR CONCRETE PLACING

STM gained great experience in concrete placing systems, particularly in the placement of RCC concrete used in the gravity dam construction. To meet the needs of the contractors who want equipment able to follow the dam growing and to





belt closes itself as a pipe and moves on air cushions, avoiding any friction which allows it to reach extremely high speeds.

To transport the waste these belt conveyors are usually inserted into a complex and articulated system in which every single element is fundamental for the overall functioning of the whole industrial plant. In a plant for electricity production from waste, STM usually carries out the complete engineering for flows exchanges, paths for personnel, access points, maintenance areas, load bearing structures, pylon towers, conveyor switching. Even if the material in this case is not so difficult to process or to transport, the low density make it necessary to change the design approach to handle a high material volume, but at the same time to guarantee high values of tpa to

assure them uninterrupted feeding, STM team was able to study and develop the new swinger conveyor: a special conveyor with main features of rotating (even up to 360°) and self-elevation.

Focusing on the elevation feature, it is possible to have two main systems to use to carry out the elevation and change the height of the discharge point. In the first system the swinger uses an external support as pivoting point, usually precast concrete modules. In this way the main support is a cylinder, that will move in the below well. The other system that can be used is a self-elevating tower system: the support tower is inserted into a bigger structural tower that will be the pivoting point necessary to modify the height.

This particular conveyor is much appreciated because it satisfies one of the more compelling need of the contractors who use concrete as construction material.

SPECIFIC CONVEYING SYSTEM FOR SPECIFIC MATERIAL

Additionally STM gained experience also in the handling of other materials to produce energy as petroleum coke or waste. Petroleum coking is an environmentally responsible recycling process used in some oil refineries to make the most use of hydrocarbon residuals that otherwise would go to waste. Enclosed conveyors are often used to move the coke into a storage building and then onto docks for loading, onto barges, ships or to land-based transportation loading facilities. The conveyor used in this field is known as a Flow Dynamic Conveyor (or air supported belt conveyor) and has very particular features. Indeed this system does not have rollers and the rubber

adequately feed the processing machines.

Conveyor systems provide an efficient, reliable, cost-effective and lower-risk method of removing muck and spoil from tunnelling excavation sites. The core competencies and expertise allows STM to continually update the used technology so that it can offer to customers its own solution: the continuous conveyor. This item of equipment is specifically engineered to handle smoothly the transport of materials from the tunnel excavation site to the surface and beyond. Large belt conveyor storage capacity increases TBM (tunnel boring machine) utilization, reduces construction time and results in lower costs.

STM was able to achieve these outstanding triumphs thanks to its expertise in every area of activity, strong focus on the customer, passion for innovation and improvement and particular attention to quality.



Bespoke grabs and buckets from Italy's Negrini



ELEKTRO-HYDRAULIC CLAMSHELL GRAB

Negrini Company, which specializes in engineering and manufacturing a comprehensive range of grabs and buckets for rope machines and crawler mounted cranes, has been active in the market since 1967. 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. Among the latest of Negrini's innovations, its electro-hydraulic clamshell grab deserves a special mention:

KEY FEATURES

The traditional construction includes 90° welded plates; in this case the material pastes easily on the walls, the insertion of a profiled plate inclined at 45° greatly strengthens the structure and creates two 45° corners facilitating the sliding of the material.



The bucket may be provided with valves of different shape, 'standard' valves, valve with opening windows to reduce load capacity, 'anti-dust' or 'containing' valves to reduce the loss of material. It is possible to apply metal or rubber roofings to reduce loss of dust, protecting the environment. It is possible to change the characteristics of the bucket by replacing the valves, mounting large valves for moving light materials, or smaller (but heavy and robust) valves for hard and compact materials.

The timing of the valves is obtained via innovative hydraulics, which does not use teeth or rods eliminating wear, breakage and maintenance. This is achieved by the equal oil distribution to jacks through a innovative hydraulic circuit; the jacks receive the same amount of oil on both opening and closing, ensuring the correct movement of the valves without using mechanical parts.

All jacks have a retarding device to prevent collision between the 'end-run' lines during valve opening.

Pistons are protected from shocks, hydraulic hoses are wired inside the structure. The total protection of pistons and hydraulic hoses prevents accidents such as the bucket exiting from the ship hold.

The most sensitive and difficult to maintain area is the connecting socket of the valves; Negrini uses a large bush, which is easy to replace.

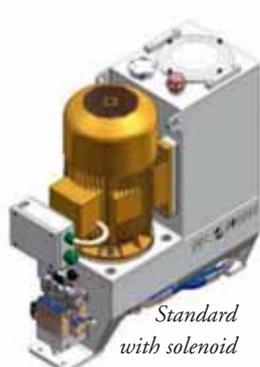


All the pins will be greased automatically through an electric pump and a specific distribution circuit, each pin will receive a fixed amount of grease regardless of the resistance created by

dirt, distance, etc., each pin will be lubricated as programmed. The operator will be required to check the grease level in the tank. The pins are automatically lubricated, but can keep the traditional greaser to allow manual greasing in case of an emergency.

The whole electrohydraulic system is accessible by removing the hoods, allowing ordinary maintenance. The hydraulic unit is independent and can be easily removed, tested or controlled comfortably 'on the ground', without unplugging electrical or mechanical parts; with only four hydraulic couplings to the bucket, the operation may take about one hour. The hydraulic central unit has been inserted in a single metal block, the entire valve block can be replaced simply by removing four screws. The operation can be performed even, by non-expert personnel.

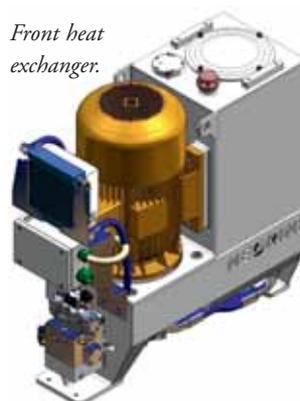
The buckets can be fitted with standard hydraulic units (with solenoid valves) or with reverse motor, in the latter type the opening and closing of the bucket will be controlled by the reverse rotation of the motor. The versatility of the project will allow the bucket to accommodate non standard hydraulic units, in many cases the units will be replaceable. **DCi**



Reverse engine



Front heat exchanger.



Heat exchanger on top.





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PET

FIBCs MADE OF PET TAPE FABRIC

New possibilities in bulk material logistics! 

PET FIBCs are characterized by the following special features:

High tenacity, **high creep modulus**, low residual shrinkage, **form stability**, **very low bulging**, improved abrasion resistance, multiple stacking, coatable, recyclability. Due to their dimensional stability, PET FIBCs, are a cost-cutting alternative to expensive packaging such as cardboard octabins.

1835 – 2015: Starlinger's first 180 years



Starlinger

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textile packaging | consumer bags | recycling technology | viscotec



Bag & baggage

the enduring popularity of FIBCs and other bags in the bulk industry



Starlinger: machinery for the production of dry bulk packaging

Starlinger is a machinery manufacturer which specializes in equipment for the production of woven plastic packaging. Machinery is supplied for 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.

Due to its strength and durability, woven tape fabric is used in heavy duty applications such as FIBC (flexible, intermediate bulk container) production or for dry bulk goods that require durable and protective packaging.

The company's customers are mainly packaging producers who cater to the construction and building materials industry (cement, lime, gypsum, and so forth) but also the chemical (powders, resin, etc.) and food (flour, grains, cereals, dry pet food, etc.) sectors. A growing share of cement producers have

started to produce their own cement bags in the last years, using Starlinger's AD*STAR[®] woven block bottom sack technology. In the past three years, Starlinger has installed machinery for a production capacity of three billion AD*STAR[®] sacks worldwide.

Important markets in the field of dry bulk packaging are the Central Asian countries, the South-East-Asian region, as well as Latin America. Also, North America has great potential, especially in the FIBC sector. In September 2015 American Starlinger-Sahm, Inc., the US subsidiary of Starlinger, officially inaugurated its new headquarters and showroom for technology trials in Fountain Inn, South Carolina.

Major competitors are mainly located in China and India. As is the case with many other leading technology developers, Starlinger technology is copied and sold in this region.

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STAYING COMPETITIVE IN THE MARKET

To keep its customers one step ahead of their competition, Starlinger continuously improves existing technology and develops new technical features that improve production efficiency, output and product quality. The aim is to reduce the production costs of the sacks and thereby ensure competitive prices. With this in mind, Starlinger gears production technology towards less raw material and energy consumption, ensuring at the same time that the required packaging characteristics are achieved. Starlinger also develops new packaging products made of woven tape fabric in order to open new markets for its customers.

A strong focus on customer-oriented technological innovation, long-standing trustful partnerships with customers, and reliable and quick technical support worldwide ensure Starlinger's position as a major presence in woven bag production technology.

MAJOR CONTRACT AWARD

Among recent contracts won by Starlinger is a major project for UAC in Jeddah, Saudi Arabia.

Machinery purchased by the client include tape extrusion line, circular looms, coating line, and an AD*STAR® sack conversion line. All machinery will be installed this month (November 2015). UAC will then be able to produce a staggering 180,000 FIBCs, seven million standard woven sacks and 10.5 million AD*STAR® sacks each month.

UAC decided to install the new equipment due to rising demand for the high-quality woven polypropylene sacks UAC provides. The AD*STAR® sacks will be supplied to Saudi Arabian gypsum manufacturers and the cement and construction material industries in GCC (Gulf Cooperation Council) countries and Africa, where manufacturers are increasingly moving from paper sacks to woven polypropylene sacks for better content protection.

FIBCs MADE OF PET TAPE FABRIC

The latest innovation in FIBC packaging are FIBCs made of PET (polyethylene terephthalate) tape fabric, the production

technology for which was developed by Starlinger. Due to the special material properties, PET tape fabric is especially suited for heavy duty applications such as container bags. It can replace expensive cardboard octabins or containers, and due to its temperature resistance, it can be used as packaging for hot fill applications.

FIBCs made of PET tape fabric have exceptionally high strength and long-lasting form stability. They are resistant against abrasion during transport and can be stacked in triple stacks for long-term storing even under severe environmental conditions. After discharge, the PET FIBCs can be recycled and the regranulate used anew.

SEALING INSTEAD OF SEWING: IC*STAR SACKS

IC*STAR is the name of the newest sack type developed by Starlinger. Contrary to standard raffia sacks for sugar, grains, flour, chemicals or building materials which have a sewn sack bottom and sack top, IC*STAR sacks are heat sealed. This technique helps to save input material during sack production because lighter fabric can be used to achieve the same carrying capacity, and no extra material is required for folding the seams. In addition, the sack is completely tight. IC*STAR sacks can be produced from coated and uncoated polypropylene tape fabric.

GENERAL COMPANY BACKGROUND

Starlinger is a Vienna-based engineering company with production sites in Weissenbach and St. Martin, Austria, as well as Taicang, China. As the world's leading supplier of machinery and complete lines for woven plastic bag production and PET recycling and refinement, Starlinger & Co. Ges.m.b.H. is a synonym for leadership in quality and technology in over 130 countries. Founded in 1835, the family-owned business has been exporting machines worldwide for more than 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.

In 2015 Starlinger celebrates its 180th anniversary.

AD*STAR® is a registered trademark. AD*STAR® sacks are produced exclusively on Starlinger machinery.

Eceplast liners enable the transport of bulk material by container



Eceplast is an Italian, family-run company based in Troia (Apulia), where it houses a centre for research and development, the company's administrative offices, and the main production site. Born out of the technical expertise of its founder, and his intuition and ability to find solutions and resources where others only see problems, today

Eceplast is a world-renowned brand. The production plant is a technological marvel, with record levels of automation in this sector.

Eceplast manufactures liners for containers, for the transportation of bulk product by container, as well as other products. The concept of shipping dry bulk by container has been popular with the chemicals industry for more than 30 years. However, it is only recently that other industries have also started to consider the option. The main driver

of change is that linerbags provide a very efficient way to ship bulk goods. However, not all commodities behave in the same way. For this reason, Eceplast has a skilled R&D team that works hard to find the appropriate solution for each product. For example, the company developed its FLUID LINER® expressly



for the cement industry, but it has now adapted this to work with starch and silica, and other commodities will be handled in the future.

Here, Nicola Altobelli commercial director of Eceplast talks about his company's new products for Transport Logistic, as well as the challenges of maintaining quality in a cost-oriented market

CAN YOU TELL US A BIT MORE ABOUT YOU AND HOW YOU CAME TO WORK WITH ECEPLAST?

Eceplast is my family's company. Exactly 20 years ago my father decided to change our lives, becoming an entrepreneur and involving the whole family in his lifelong project with his passion and vision. I can proudly say that I personally contributed to the production of the first samples of liners when I was still a student.

My choice then was very straightforward. After my college graduation in 2003, I joined the company in the sales team with a focus on developing the European market. Nowadays I am the commercial director, my father is still the CEO and my two younger brothers, Vito and Alessandro, both engineers, are working for the company developing new products and improving the efficiency of our production plant to stay always very competitive on cost and be one step ahead the competitors.

COULD YOU PROVIDE US WITH A SHORT OVERVIEW OF ECEPLAST'S AREAS OF OPERATION?

Linerbags, in a wide variety of versions, still represent the company core business, but 2015 is a turning point and at Transport Logistic this year we will present new sets of products and services introduced also thanks to the strategic partnerships developed in the last two years and that we are now ready to disclose. As a matter of fact we are now ready to offer Flexitanks, Thermal Liners and FIBCs. A wider range of products that we intend to offer to our established or new customers,



having selected premium class partners to expand our market globally.

HOW HAS THE COMPANY DEVELOPED OVER THE PAST FIVE YEARS?

If I looked five years back I would not see a big difference in terms of market share and revenues, but this is probably the wrong way to look at things. In fact we have followed a strategic development plan to look at the next five years as the most challenging and promising in our history. We have invested deeply in our human resources, employing more young and skilled workers, building up an R&D and Quality team of five engineers that nobody else in the market has. We have built an internal Liners and Flexitanks Test Facility and have also developed new automated production lines to better face our cost-based competition.

In total, the expansion of the Italian headquarters with production plant and company offices gives us a covered area of 30,000m² in our home town of Troia. Targeting a global market will also include some strategic investments abroad, with India and UAE in first raw, followed by USA west and east coast sales office and warehousing location.

HOW COMPETITIVE DO YOU CONSIDER THE MARKET YOU OPERATE IN?

It is a very competitive and price-oriented market. It is very hard to understand sometimes how even very important and wealthy companies can be tempted by savings of a few cents, risking huge economic and image problems in case of failure, but this is the case. It is our job to constantly look for cost optimization, and to develop innovative solutions helping customers to convert more and more products from packed to bulk. In the long term, our policy to build partnerships with customers is the best way to stand out from the crowded environment of low-cost Asian based producers.



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WHAT DO YOU OFFER TO YOUR CUSTOMERS IN ORDER TO CREATE LOYALTY?

The quality and reliability of our products are not negotiable. We never promise what we cannot deliver, either in terms of price or service. For example, with product liability insurance, when others simply say: "sorry we only replace a faulty liner" we can cover all costs. We also provide technical support and know-how to develop innovative solutions, and thanks to the newly installed Test Facility, developed in co-operation with University Politecnico of Bari, we can internally load and test new materials to be transported in bulk containers.

WHAT DIFFERENTIATES A GOOD PRODUCT FROM A POOR ONE?

This is a very hard and challenging question. Most of the time the customers are not able to identify or classify packaging

materials apart from in a very simplistic way: failed or worked. Of course, this makes the life of high-quality packaging producers, very hard. Normally in the long term (thousands of pieces) bad quality results in massive extra costs.

HOW DOES ECEPLAST ENSURE THAT ITS PRODUCTS ARE ENVIRONMENTALLY FRIENDLY?

This is one of the latest development that we are working on at Eceplast. Even if we start from the assumption that all our packaging materials are naturally replacing many other pieces of smaller packaging, they also help to optimize the transported volumes and quantities and reduce loading and unloading operations. We have just commissioned a formal analysis of what the real impact of our products is in terms of their carbon dioxide footprint.

DO YOU FEEL THAT TRADE ORGANIZATIONS SUCH AS EFIBCA DO ALL THEY CAN IN ORDER TO SUPPORT THEIR MEMBERS AND ARE ECEPLAST MEMBERS OF ANY SIMILAR ORGANIZATIONS?

Absolutely yes. I'm strong supporter of representative organizations. We are member of EPCA and GPCA as well following the COA organization for the Flexitank code of practice.

WHAT PLANS DOES YOUR COMPANY HAVE FOR EXPANSION?

Our plan is to scale up our company model through building strategic partnerships worldwide, implementing new products in our product portfolio to offer a wider range of packaging and related services to our existing and new customers.



Left to right: Giuseppe Altobelli, CEO; Nicola Altobelli, Commercial Director; Vito Altobelli, Technical R&D Director; and Alessandro Altobelli, Production Manager.

Cesur Packaging Corp's FIBCs for cement

Flexible intermediate bulk containers (FIBCs), or big bags, are among the most cost effective and ideal types of packaging for shipping and storing dry bulk products and cement.

Cesur Packaging Corp's FIBCs are made from polypropylene fabrics which can vary in different weights depending on the safe working load or safety factor and can be as simple as an open top with a flat base or, as a high tech unit produced within a clean room production environment.

Most importantly, Cesur Packaging manufactures its FIBCs to suit the specific requirements of each customer. Among the types offered are standard FIBCs (side seam loops and cross corner), formed bags (Q & gambo bags), conductive bags (Type C&D), potato bags (ventilated), UN bags (dangerous goods) and I&2 loop big bags for cement.

WHY USE FIBCs FOR CEMENT?

Over a billion tonnes of products are transported all around the world every year in FIBCs, and this volume is growing fast.

FIBCs are used for many products, including: cement, chemicals, minerals, foodstuffs, pharmaceuticals, agricultural products, fertilizers, plastics, and many more.

The advantages of FIBCs is that they are cost-effective; easy to store and transport; recyclable; safe; and they also offer fast loading.



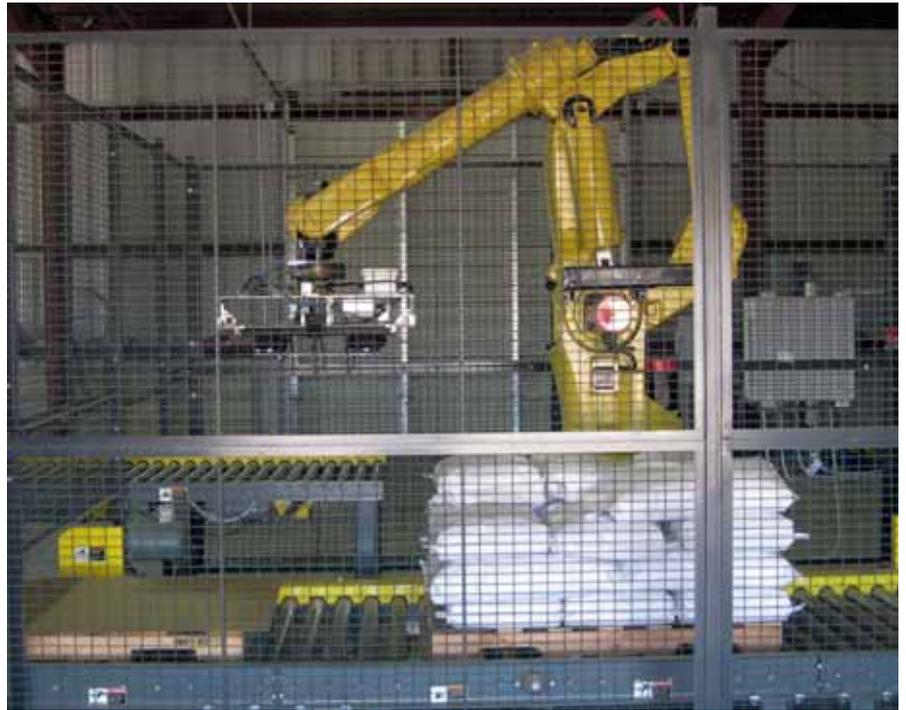
Filling, closing, stacking, weighing – all essential parts of the handling process

Bag filling, bag closing and bag stacking are significant parts of the turnkey process for many dry bulk cargo applications. The most important part of any packaging system is to completely understand the flow characteristics and tendencies of the specific product you are handling. JEM International manufactures bag and box filling machines with various feed types such as gravity gate, belt feeder, auger or screw feeder, vibrator pan feeder and a combination of these for mixing or batching applications.

The scales can be designed to pre-weigh the product, which is commonly known as a Net Weigh bagging scale. For slower production requirements or low head room applications, a Gross Weigh bagging scale is generally the preferred choice.

After the product has been filled into the bag, it will be transferred on a bag closing conveyor to either a sewing pedestal, heat sealer, pinch bottom closer, PILS, etc. depending on the type of bag being utilized.

Once the filled bags have been closed, they will travel down a conveyor to be positioned for manual or automatic palletizing.



Some common options include inline knockdown/turning conveyors or 90° bag kicking conveyors. A bag flattener conveyor will greatly help produce a stable and good-looking pallet. If you are loading directly into containers or open top trucks, longer conveyors can be utilized to meet these requirements.

A very popular trend of late is to use robots for automatic palletizing. Robots greatly increase production speeds and help to minimize workplace injuries that are caused by lifting and turning while operators are manually stacking bags.

Another recent trend is to package products and palletize directly on a ship's port. JEM International offers a portable bag plant system specifically designed to be loaded with a ship's grab. The portable bag plant can be closed up, taken apart and stored safely in a warehouse when it is not being utilized.



Moving product from big bags to enter the bulk handling process

QUICK, CLEAN AND ERGONOMIC INSTALLATION FROM TBMA

One of the recent developments in the bulk handling market is that more and more clients are in need of special and custom-built solutions for a reasonably price. TBMA Europe has 50 years of experience and a wide range of components, which enables it to offer custom-built solutions, such as repacking installations that move product from big bags, or FIBCs (flexible, intermediate bulk containers) to enter the bulk handling process.

The installation, developed by TBMA, had to meet requirements such as: a high capacity; suitability for different products; and of course high ergonomic and hygienic requirements. The developed FIBC installation can handle a large variety of FIBCs with or without outlet spout. Almost all known FIBC sizes and 'single-use' bags can be processed as well.

TBMA's discharge station can handle two FIBCs at the same time. It consists of two discharge hoppers, two small transverse screws which move the product into the central screw conveyor, and a dust extraction unit which brings back the extracted product into the screw. In this way, all the product is processed neatly and there is hardly any waste.

This FIBC installation offers very efficient discharge hoppers to unload FIBCs filled with difficult products. The hoppers are engineered with steep walls and a vibration motor to ensure that even the most difficult products can easily be unloaded.

A flexible membrane with a smaller opening than the diameter of the FIBC is mounted at the upper side of the discharge hopper. Joining this membrane seamlessly around the FIBC when it is being placed in the hopper. Then the bags can securely be opened through the trapdoor in the hopper. 'Single-use' bags, or bags without outlet spout, are opened with a special 3-sided knife which cuts a large incision in the bottom.

Both hoppers are connected to an integrated filter system. The installation is also equipped with a Moduflex loading chute.



Together they ensure that the amount of dust escaping during the opening and emptying of the FIBCs is being reduced to a minimum.

The entire installation is assembled on a framework, according to the 'plug-and-play' concept. In this way, a forklift can easily move the framework and make room for other handling operations, if needed. Depending on the type of product, this installation can discharge well over 20 FIBCs per hour.



HYBRID^{PRO}: combining the best of both worlds

Mondi is making further progress in the evolution of industrial paper bags by launching a bag that offers uncompromising weather protection and significantly extends the shelf life of its contents. The HYBRID^{PRO} is a technically demanding combination of paper and plastic, and is suitable for many industries and applications, particularly construction materials.

Conventional industrial bags made of paper tend to be vulnerable to rain and moisture. When exposed to direct rain on an unprotected pallet, a standard paper bag absorbs water and may weaken as a result. Handling may then become awkward, and the shelf life of the contents may be affected. In some cases, a switch to plastic bags is the answer. But this may not be the optimum approach, as the cost of investing in form-fill-seal (FFS) machinery tends to be high. Mondi, ever conscious of its customers' needs, has come up with a hybrid solution to the dilemma: the HYBRID^{PRO} bag, offering the advantages of a plastic bag, yet fillable on conventional paper bag filling systems.

With the HYBRID^{PRO}, paper combined with plastic really can provide the best of both worlds: uncompromising weather protection thanks to the bag's outer PE barrier layer, allowing genuine outdoor storage for lengthy periods and extended storage stability, without the need to invest in expensive FFS filling systems.

THE NEXT GENERATION OF WATER-REPELLENT PAPER BAGS FROM MONDI

The HYBRID^{PRO} bag, which will be marketed under the slogan 'Made of PaPEr – combining the best of both worlds', represents a whole new concept in industrial bag design. Like a hybrid drive in a car, the HYBRID^{PRO} is an excellent combination of the available options: the inner ply is made of 120g/m² Mondi Advantage ONE sack kraft paper; the outer ply is a 40µm-thick layer of high-density polyethylene (HDPE). The innovative step here is that the HDPE forms a protective layer on the outside of the paper. Other bags also use a combination of paper and plastic, but not in this way. This is a considerable technical achievement that brings a new dimension to industrial bag design.

The HYBRID^{PRO} belongs to Mondi's next generation of water-repellent bags, developed as part of the company's focus on exciting new solutions achieved through ongoing R&D. The bag — for which a patent is pending — is yet another successful outcome of Mondi's strategic emphasis on collaboration with customers during the product development process.

THE BENEFITS

With the HYBRID^{PRO}, building materials such as gypsum and cement enjoy excellent protection against direct rain during shipping or on site. The HYBRID^{PRO} also provides excellent protection against gradual moisture ingress during outdoor storage, thanks to the 40µm thickness of the unperforated HDPE film. This means shelf life is longer than with standard paper bags. For example, according to building materials producer Knauf, which collaborated in developing the



HYBRID^{PRO}, gypsum packaged in the HYBRID^{PRO} enjoys an eight-month shelf life when stored outdoors with no further protective layer — twice as long as if packaged in a standard paper bag.

This impressive performance outdoors makes the bag very user-friendly and has benefits when it comes to streamlining the supply chain of fillers and end-consumers: with longer shelf life, order sizes can be larger, for potential reductions in shipping costs.

Since the bag can be filled on conventional paper bag filling systems, investment in FFS systems, which tend to be expensive, is not required.

COMPELLING ADDITIONAL BENEFITS

The bag's outer ply — which forms the barrier against rain, moisture and dust — is made of plastic film, giving it an attractive, modern appearance, an important factor in many markets. The HDPE film can be printed in up to eight colours, including on the bottom patches, for a glossy, premium look, and the paper ply is available in a bleached or an unbleached version.

The HYBRID^{PRO} allows high-speed filling, with de-aeration twice as fast as with a standard three-ply bag (35m³/h versus 18m³/h tested on Mega Gurley equipment at Mondi's R&D centre BAC in Austria).

Workplaces, such as construction sites, are cleaner with the HYBRID^{PRO}, as less of the contents adhere to the outer layer —

a benefit sure to appeal to end users.

The HYBRID^{PRO} is an eco-friendly solution: the total grammage of material used is less than with standard three-ply designs used for the same purpose.

Last but not least, the plastic and paper components are easy to separate, for optimum recyclability.

APPLICATIONS

The HYBRID^{PRO} is a high-quality packaging solution conceived for high-quality contents. It is particularly suitable for building materials, including gypsum and cement, as well as many other moisture-sensitive products. The bag is suitable for filling contents at temperatures of up to 90°C.

The HYBRID^{PRO} was developed alongside Mondi's showerproof paper SPLASHBAG (launched at the beginning of 2015) as part of Mondi's next generation of water-repellent bags, in keeping with Mondi's strategic orientation to ongoing innovation (see 'Mondi launches new SPLASHBAG' on p76 of the May 2015 issue of *Dry Cargo International*).

The brand-new HYBRID^{PRO} is being presented to the public at packaging trade shows in Europe and internationally. The first trade show at which visitors were able to explore the new bag was FachPack in Nuremberg, Germany, which took place at the end of September/early October this year.

ABOUT MONDI INDUSTRIAL BAGS

Mondi Industrial Bags, a business segment of Mondi's Europe & International Division, is the leading international producer of industrial paper bags¹ in terms of sales volumes, 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 service network, the specialized filling equipment department Natro Tech, as well as its Bag Application Centre, where researchers develop and test innovative packaging solutions.

Mondi is an international packaging and paper Group, employing around 25,000 people across more than 30 countries. Its key operations are located in central Europe, Russia, North America and South Africa. It offers over 100 packaging and paper products, customized into more than 100,000 different solutions for customers and end consumers. In 2014, Mondi had revenues of €6.4 billion and a return on capital employed of 17.2%.

The Mondi Group is fully integrated across the packaging and paper value chain — from managing forests and producing pulp, paper and compound plastics, to developing effective and innovative industrial and consumer packaging solutions. Its innovative technologies and products can be found in a variety of applications including hygiene components, stand-up pouches, super-strong cement bags, clever retail boxes and office paper. Mondi's key customers are in industries such as automotive; building and construction; chemicals; food and beverage; home and personal care; medical and pharmaceutical; packaging and paper converting; pet care; and office and professional printing.

Mondi has a dual listed company structure, with a primary listing on the JSE Limited for Mondi Limited under the ticker code MND and a premium listing on the London Stock Exchange for Mondi plc, under the ticker code MNDI.

For Mondi, sustainable development makes good business sense. It doesn't just talk about sustainability; Mondi makes it part of the way it works every day. Mondi has been included in the FTSE4Good Index Series since 2008 and the JSE's Socially Responsible Investment (SRI) Index since 2007.



¹ Based on sales volume. Source: Eurostat, Freedonia World Industrial Bags 2011 study prepared for Mondi and management estimates.

Hapman's bulk bag unloaders and fillers handle FIBCs of varying sizes & materials

Hapman's bulk bag unloaders and fillers are used across all bulk material processing industries. These include: chemical, food and agriculture, minerals processing, building materials, cement, lime gypsum, and more. The company's customer base in these industries range from the large companies with 4,000+ employees, to the smaller producers with only 50 employees or fewer.

Hapman's product managers and customer service team provide customers the highest quality service before, during, and after start-up. It offers a very broad line of equipment. This means its customers receive a single source partner for all material handling needs. Its awarded projects span from the multi-million dollar capital projects to smaller purchases for R&D activities. Hapman has over 7,432m² of manufacturing space in the US and 5,574m² of manufacturing space at its European headquarters in Opole, Poland. Hapman also designs and manufactures: flexible screw conveyors, vacuum conveyors, en-masse conveyors, tubular drag chain conveyors, feeders, lump breakers, bag dump stations, and bag compactors.

Hapman offers multiple options to customize bulk bag unloaders to meet the needs of each application. Bulk bag unloader (FIBC) frames are offered in two styles: fork lift style for a driver to load bulk bags or a hoist and trolley style where a single operator can utilize the hoist to hook on to the bulk bag and raise it into the unloader frame. Hapman's bulk bag unloader offers a long-lasting, robust frame to meet your specific bag size and application.

Bulk bag conditioners are also available to break up hard agglomerations in bulk bags using hydraulic conditioners in conjunction with pneumatic paddle agitators to massage bulk bag material into the discharge point. The low profile bulk bag unloader is ideal for manufacturing spaces with low ceiling areas and allows a forklift to be fully extended. The patent-pending side rails serve as a guide for a forklift driver for placing the bulk bag.

Hapman engineers and manufacturers each piece of equipment. It controls the production schedule for the equipment, the cost, and the quality of every piece of equipment or system it supplies to customers. Hapman's 70 years of bulk material handling experience, coupled with its 100% performance guarantee, are the reasons its customers own and operate Hapman equipment.



HAVER ADAMS® technology – waterproof, clean and profitable



TECHNOLOGY FOR THE FILLING OF POWDER BULK PRODUCTS INTO AIRTIGHT PE PACKAGING

The HAVER & BOECKER ADAMS® filling system is the environmentally friendly packing of powder-type products into sealed, clean and tight PE bags. The FFS system can act as the heart of a turnkey plant in the industry. HAVER & BOECKER and its subsidiary companies deliver the complete solution from a single source: The complete plant planning, delivery of individual system components (processing, storage, filling, packing, palletizing, loading and automation) and the engineering of the complete process within a plant.

HAVER & BOECKER has now issued a system guide outlining the advantages of filling powder products into PE packages and the unique selling propositions of the ADAMS® technology. Further information as well as the system guide can be provided by Sebastian Südhoff, Product Manager at HAVER & BOECKER. As an expert for the ADAMS® technology, he is involved in every ADAMS® project right from the beginning, and examines — in consultation with the customers — the various fields of application of the packaging system according to the respective requirements.

TOP QUALITY IN PE BAGS

The highest quality right from the beginning — this is what products filled with the ADAMS® technology as well as their plastic packaging offer. Tightly sealed PE bags stand for a long lifetime and a consistently high product quality for powdery products along the entire transport and storage chain — stored outside or inside. “Due to the high level of weather resistance

and UV and aroma protection offered by PE bags, the packed products are always reliably protected even under harsh outdoor weather conditions. The tear resistance of the packaging guarantees up to 95 % less transport and warehousing damage,” is how Südhoff explains the major advantages of the packing material.

CLEAN AND ATTRACTIVELY PACKED

A clean and appealing presentation at point of sale is crucial for a product’s success. The packaging not only protects the product, but it also conveys a message to end consumers. On the market it bears the company’s image. At building sites, during transportation or storage, on the sales floor, inside or outside — PE bags ensure dust-free surroundings, as well as a clean and attractive presentation along the entire delivery and storage chain.

The ADAMS® technology already achieves clean results during the filling process, amongst others due to product compaction within the package. Low dust development ensures high operation protection.

HIGHLY ECONOMIC

PE bags that are handled with the ADAMS® technology can be presented in an appealing manner, and offer a decisive competitive advantage. Furthermore, it offers cost savings in storage, transportation, material and staff.

Since products now may be stored outdoors, they are no longer seasonal. The plant can produce with constant capacity utilization over the entire year. This secures sales during periods



of peak orders, makes production smoother, saves on unnecessary extra work and simplifies planning.

The ADAMS® technology also saves on film consumption. Thanks to its efficient product compaction, smaller and more compact bags with less volume result in significant material savings for customers. Already before filling, the empty bags need less space in transport and storage — thus leading to lower costs.

Because of low dust levels during filling, there is less wear and tear to the machines and downstream systems. The needed materials for maintenance and repair decrease and machine downtime is reduced. “The results: constant production capacity utilization and lower operating costs,” summarizes Südhoff.

PRODUCT-SPECIFIC DOSING AND VIBRATION COMPACTION SYSTEMS

Product compaction inside the bag is a fundamental requirement for achieving a clean and efficient final result. Inner and outer vibration compactors provide the needed production compaction. Thanks to micro-vibration, air

bubbles automatically rise upwards within the product. “The secret is the air removal at and inside the bag,” reveals Südhoff. The advantages offered by this mechanical process are high reliability and reduced downtimes.

REDUCED HEIGHT BY COMPACT MACHINES

HAYER & BOECKER ADAMS® machines are characterized by their minimal height. They are compact in design and completely enclosed inside a housing unit. This offers special advantages when existing machines need to be replaced and only limited area and height are available for new replacements.

DCi



Baltic bulk activity

key investments driving progress in the area



Gdansk Bulk Terminal (photo: Port of Gdansk Authority SA.).

Louise Dodds-Ely

Major investment in the Port of Gdansk – and this is just the beginning

€1.9 BILLION INVESTMENT IN THE PORT OF GDANSK

The next five years at the Port of Gdansk will see the implementation of the largest-ever investment programme, in terms of both scope and expense.

The programme initiated by the Port of Gdansk Authority and worth over €200 million, which will cover almost the entire area of the port, including the Inner and Outer Port, will be partly funded from European Union (EU) funds, with more than half — that is, €114 million — to come from the budget of the Port of Gdansk Authority SA.

The programme will include strategic development for the Port of Gdansk estimated at €119 million as well as investment to meet the current requirements of the port totalling €81 million. Naturally, the realization of some of the work will ultimately depend on the decision to grant EU funds. However, it is assumed for the moment that the most costly period of the investment will be between 2017–2019. During this three-year period, over €140 million of investment can be expected.

Some of the investment projects are already under way, such as the expansion of the intermodal container terminal at the Szczecinskie Quay, which by the end of this year will have standardized the handling capacity of the terminal (i.e. storage, handling and loading).

Investment work is also in progress at the Oliwskie Quay (universal quay), which will be thoroughly modernized both on land and in water. On the right bank of the port, by the Coal Pier, investment is currently ongoing to strengthen 24 hectares at the base of the basin used by the largest ships calling at the port to charge coal cargo. However, the investment process is being conducted in such a way so as not to interfere with the operation of the pier or obstruct the handling berth.

The electricity and power infrastructure at the port is also being modernized. The increasing demand for power supply at the port, the growing number of customers, and finally the expansion of the terminals located in the Outer Port, necessitated the modernization and improvement of this

THROUGHPUT STATISTICS AT THE PORT OF GDANSK

	2014 JANUARY to AUGUST			2015 JANUARY to AUGUST			Difference	
	IN	OUT	TOTAL	IN	OUT	TOTAL	Total	%
Total cargo throughput	11,955,559	8,434,042	20,389,601	13,889,796	9,581,709	23,471,505	3,081,904	115.1%
BULK CARGO TOTAL	8,262,166	4,800,686	13,062,852	10,012,807	6,082,469	16,095,276	3,032,424	123.2%
Liquid bulk	4,985,640	2,490,562	7,476,202	6,930,664	3,144,330	10,074,994	2,598,792	134.8%
Dry bulk	3,276,526	2,310,124	5,586,650	3,082,143	2,938,139	6,020,282	433,632	107.8%
Of which:								
Cereals	527,615	487,082	1,014,697	366,083	608,237	974,320	40,377	96.0%
Fodder/oilseeds	0	22,554	22,554	0	41,151	41,151	18,597	182.5%
Coal	874,012	1,241,568	2,115,580	1,109,111	1,846,346	2,955,457	839,877	139.7%
Ores	0	0	0	5,031	0	5,031	5,031	—
Fertilizer	160,256	0	160,256	170,145	0	170,145	9,889	106.2%
Other dry bulk (scrap iron, steel, etc.)	1,714,643	558,920	2,273,563	1,431,773	442,405	1,874,178	399,385	82.4%

infrastructure. To this end, the Port of Gdansk has undertaken a difficult investment requiring medium voltage cabling to be installed under the port channel in order to link the energy systems on both sides of the Dead Vistula river. In addition, the investment includes upgrading the systems for securing and controlling the Main Switching Station in the Outer port, the substation and the MV grid. As a result, the project will contribute to an improved efficiency of 30MW for the electricity supply at the port.

These are just a few of over 100 investment projects planned for the current year.

The port still has many planned investment projects for the future, but among them the two largest in terms of scope are the modernization of the fairway in the Inner Port and the road and rail networks in the Outer Port.

The first project, worth nearly €120 million will include the reconstruction of 16 quay sections at the Inner Port with a total

length of 5.8km and the deepening of the whole port channel, which aims to improve navigation conditions in this part of the port. The outcome of the investment will be a 90-metre-wide fairway in the Inner Port with a depth of 12m, ensuring efficient and safe navigation between the port entrance to the turntable at Remontowa Shipyard. Further on, in the so-called Kashubian Channel, navigation conditions will be slightly different with a track width of 75 metres and a depth of 10.8m. Thus, in both parts of the track maximum permissible parameters of vessels will be 250m long from the entrance of the port to the Kashubian Channel and to 190 metres in the Kashubian Channel.

The Inner Port is a very important part of the port, which each year services around 2,000 merchant ships, not to mention at least another thousand vessels which call at the port for other purposes or in transit. The Inner Port is also a key area from the point of view of ensuring a universal range of services. For example, last year nearly 70 different types of goods



The Oil Terminal under construction (photo: Kacper Kowalski/Port of Gdansk Authority SA)



General view of the port (photo: Kacper Kowalski/Port of Gdansk Authority SA).

belonging to each of the six main cargo groups were handled here. This totalled 7.5mt (million tonnes) in volume, nearly one quarter of the annual tonnage record for the whole port.

Let us not forget about the most developing part of the port — the Outer Port. Increased transshipment (nearly 25t of goods in 2014), the ongoing expansion of the terminal and the planned construction of new ones, naturally created a need to ensure the development and modernization of road and rail access infrastructure. The investment will include the construction and reconstruction of streets with a total length of 7.2km and rail tracks with a total length of 10km. The total value of all works involving the Port of Gdansk Authority, covering an area of approximately 70 hectares, has been estimated initially at €26 million. Moreover, the investment will cover another 29 hectares for similar works on adjacent urban areas and will require another €42 million.

These investments by the Port of Gdansk Authority, despite amounting to the considerable sum of over €200 million, are just the beginning. A further €1.6 billion will be added over the next five years by companies operating in the areas of port. These include PERN currently undertaking the construction of the oil terminal, DCT Gdansk SA which is expanding the container terminal. Gdanskie Zakłady Nawozow Fosforowych Fosfory Sp. z o.o. (Gdansk Fertilizers Plant) is also planning to invest nearly €25 million in the port. It is worth recalling at this point that the PAGO company is also building some cold storage facilities. The OT Logistics company is constructing a deepwater grain terminal — as recently as 21 September, they signed a preliminary agreement with the port authority in this regard. If we add to this the ever expanding Pomeranian Logistics Centre, the value of which is estimated at €240 million, or investment projects in access infrastructure, including the modernization of the 226 railway line along with the construction of a railway bridge over the Dead Vistula river, it can be stated that at

present the Port of Gdansk is one of the most frequently mentioned areas in the context of the largest and most important infrastructure investments in the region.

Investments to improve access to the port from the sea are also exceptionally important and are planned by the Maritime Authority to include: the modernization of the entrance to the Inner Port in Gdansk as well as the modernization of the breakwaters at the Northern Port.

To summarize, for the first time in the Port of Gdansk's over 1,000-year history, the next few years will see the accumulation of infrastructure investment affecting all modes of transport crossing the Port of Gdansk — the country's largest logistics hub. The whole of the planned investment is a response to the challenges posed by a growing market demand for maritime transport in the Baltic. As expected, the Port of Gdansk over the next few years could even witness a tripling of the annual volume of cargo. Accordingly, it is necessary to carry out this investment programme that will soon completely transform the port we know at the moment. The almost €2 billion to be invested over the next five years in infrastructure will undoubtedly influence the final form of the port — an area that is set to become a powerful, modern and competitive Europe distribution centre reloading, the initial link in the Baltic-Adriatic corridor, which will be the logistical locomotive not only of this region, but the entire country.

The Port of Gdansk, aware of the huge potential and interest in Gdansk, in the port development strategy for 2027 also took into account some further multibillion-dollar initiatives. One of them is an extended development of the port by silting the waters of the Gulf of Gdansk. The new investment called Outer or Central Port is a project set to begin after 2020, thus opening up a new operational phase as a port of the V generation — safe, modern, competitive and constituting one of the most important sources of Polish Gross Domestic Product.

Maritime Bulk Terminal Gdynia – bulk expertise in action in the Baltic region



Maritime Bulk Terminal Gdynia Ltd (Morski Terminal Masowy Gdynia Sp. z o.o. — MTMG) in Poland is located at the main entrance to the Port of Gdynia and is directly connected to the railway and road communication systems.

Operating at the Port of Gdynia, MTMG – Morski Terminal Masowy Gdynia as a universal terminal renders 24h services of reloading, storing and sorting of bulk commodities like coal, coke, ore, grain and feedstuff, biomass, sugar, minerals, aggregates, fertilizers and also liquid cargoes (including chemicals of the 3rd, 6th, 8th and 9th classes according to the IMDG code), crude oil and its derivatives.

MTMG has been awarded ISO 9001:2009 and ISO 22000:2005 HACCP certificates granted by Polish Chamber of Foreign Trade Certification and Bureau Veritas Certification.

OHSAS 18000 is an international occupational health and safety management system specification. In Poland companies in most cases decide to introduce the certification of quality, environmental and food safety systems, according to HACCP, which are dedicated to clients of the certificated owner.

OHSAS 18001:2007, an Occupation Health and Safety Assessment Series for health and safety management systems, is dedicated to companies and personnel working inside the area of certificated owner. The standards for health and safety management systems are much more restrictive than for others, which causes the process of preparation arduous and expensive. Two years ago, MTMG — as the first in the port of Gdynia — started to implement the system by managing and overseeing the key areas: recognizing danger and risk rating, training systems, communication, operation control, emergency procedures, monitoring and enhancement of safety.

As a result of this extensive work, on 11 September 2014, MTMG's Occupation Health and Safety System, was appreciated and recognized as compatible with OHSAS 18001:2007 standards. The certificate testifies that MTMG promotes a safe and healthy work environment within its area. The certificate is proof that MTMG is a socially responsible company.

"This is highly satisfying for our terminal," said Bogdan

Buczko, president of MTMG. "It is to the merit of all employees that MTMG gained the OHSAS 18001:2007 certificate, and it is proof of the importance of the experience and engagement of all workers to the success of the terminal."

MTMG boasts a wide range of equipment, including:

- ❖ three electronic truck scales for weighing vehicles up to 60 tonnes;
- ❖ two railway wagon scales;
- ❖ hoppers, wheel loaders, caterpillar bulldozers, tractors, platform and box trailers, forklift trucks;
- ❖ Liebherr 550 self-propelled grab-hook crane with a lifting capacity of 124 tonnes;
- ❖ Sennebogen self-propelled grab-hook cranes with lifting capacities of 24 tonnes;
- ❖ external parking for 122 trucks; and
- ❖ TV monitoring system.

CARGOES HANDLED

MTMG Terminal is a multi-purpose terminal and, as such, it handles bulk products that include coal, coke, agri products (such as soya bean meal, wheat, rape seed, maize, rye), feldspar, aggregates, crushed stones, sugar and so forth. This list will continue to grow, as MTMG aims to be able to handle any bulk goods that its customers require. In 2014, MTMG handled approximately 5.3mt (million tonnes) of bulk cargo. The majority of the bulk cargoes related to imported/exported coal, imported soya bean meal, and exported wheat.

In terms of liquid cargoes, MTMG handles these at its two dedicated quays. They include: ether, xylene, diesel, n-butanol, white spirit gasoline, hydro wax, paraxylene and many others including chemicals of the 3rd, 6th, 8th and 9th classes according to the IMDG code). MTMG is also able to handle general cargo.

MTMG's bulk cargoes fluctuate to some extent, in response to changes in some markets. The soya bean meal, imported coal and feldspar markets are relatively stable, while exported wheat, coal/coke and imported aggregates fluctuate rather more.



TECHNOLOGICAL EXPERTISE

MTMG is a constantly growing terminal and continually strives to achieve excellence. Continuous investments enable improvement of handling processes, thereby enhancing the quality of its services, which is one of the main strengths of the company. The terminal has a four-chamber automated warehouse with loading and unloading technology located on the Silesian Quay, designed for storage of agricultural products with a total capacity of approximately 60,000 tonnes. The warehouse has four loading stations, each equipped with an electronic weighing system. It is connected through bridge conveyors system with the warehouse situated on the Swedish Quay allowing for flexible surface disposal.

The warehouse on the Swedish Quay has a loading station equipped with an electronic weighing system. Unloading technology efficiency is 1,200 tonnes per hour.

GLOBAL REACH

In terms of bulk customers, MTMG's reach is truly global. It has agreements with companies all over the world. This customer base is stable.

COPING IN A COMPETITIVE MARKET

MTMG Terminal strives to remain competitive against direct competitors such as the Port of Gdansk, Szczecin and Swinoujscie, as well as other companies within the Port of Gdynia itself. The company remains competitive by offering a universal, modern terminal that offers high quality, customized services with stable, competitive tariffs.

QUAYS AT THE MTMG TERMINAL

Dutch Quay

- ❖ length 500m;
- ❖ maximum vessel length 300m;
- ❖ draught 13m;
- ❖ warehouses 2,341m²;
- ❖ covered stockyards 1,241m²;
- ❖ open stockyards 12,135m²;
- ❖ **equipment:** six grab-hook cranes with lifting capacities ranging from 10–16 tonnes; and
- ❖ railway weighbridge.

Swedish Quay

- ❖ length 444m;
- ❖ maximum vessel length 300m;
- ❖ draught 13m;
- ❖ warehouse 19,972m²;
- ❖ open stockyards 13,411m²;
- ❖ **equipment:** five grab-hook cranes with lifting capacities ranging from 10–40 tonnes;
- ❖ truck weighbridge; and
- ❖ railway weighbridge.

Silesian Quay

- ❖ length 353m;
- ❖ maximum vessel length 250m;
- ❖ draught 8.50m;
- ❖ **equipment:** two grab-hook cranes with lifting capacities of 10 tonnes;
- ❖ warehouse 10,920m².
- ❖ open stockyards 12,138m².

Southern Pier and Danish Quay

- ❖ length 170m;
- ❖ maximum vessel length 150m;
- ❖ draught: 9.10m;
- ❖ warehouses 3,860m²;
- ❖ open stockyards 51,775m²;
- ❖ handles liquid bulk cargoes, including the 3rd, 6th, 8th and 9th classes according to the IMDG code;
- ❖ **equipment:** dedicated tanking installation for handling liquid bulk commodities;
- ❖ pipelines: L1 (heated); L2/L3;
- ❖ pumping station;
- ❖ railway handling station for cisterns; and
- ❖ two truck weighbridges.

Liquid Fuels Reloading Post

The terminal also offers operating and technical services for the Liquid Fuels Reloading Post on the breakwater.

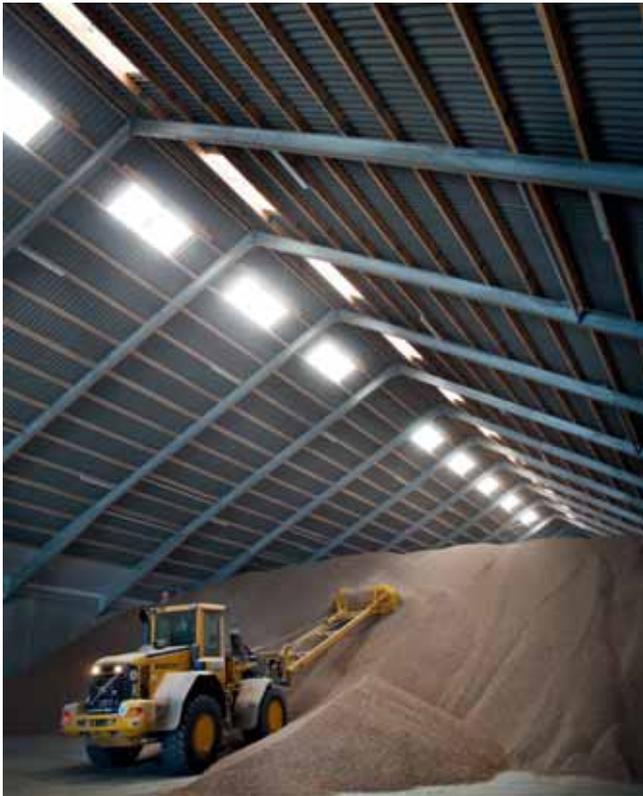
This post serves tankers with overall lengths from 100m to 210m and draughts up to 11m.

Port of Grenaa strengthens its position with new facilities and equipment

The Port of Grenaa Ltd. is investing in continued growth, which reinforces its position as a bulk port.

Two impressive large warehouses have been built on Plutovej, in the industrial port at the Port of Grenaa. Both warehouses are 2,000m² and 12 metres high. The combination of the two new bulk warehouses and the new Gottwald crane the port invested in last year will further strengthen the efficiency and the competitiveness of the port.

The warehouses are close to the quay and have particularly large gates, which makes access optimal with both trucks and



BULK WAREHOUSES

Area:	2,000m ² per warehouse
Height:	Up to 12m in the middle of the warehouse
Type of goods:	Suitable for dry goods like corn, feedingstuffs, wooden pellets and salt
Access:	Placed close to the quay, with extra-large gates which ensures easy access for large vehicles

tractor loaders. The warehouses, from day one, have been an asset for the port's clients, which transport bulk freight over the quay in Grenaa, according to key account manager at Port of Grenaa Ltd., KP Mehlsen.

"The sides of the warehouses consist of 4–5-metre-high concrete elements, so there is room to stack the goods. The floors are cast in concrete and processed to be resistant to the many kinds of goods that will pass through the warehouses — for example salt, which can be very hard on regular concrete floors," Mehlsen explains further. The warehouses are also suitable for dry goods like corn, fatty substances and wooden pellets — in short, every kind of bulk freight that cannot be left outdoors.

SECURING THE FUTURE AND MEETING CURRENT NEEDS

As well as being a reaction to the growing demand for storage, the construction of the warehouses also stems from the port's plans — which include a range of other initiatives — to ensure that it establishes a strong bulk handling presence.

With its two Gottwald mobile cranes, the Port of Grenaa is increasing its effectiveness, which will help it to attract more and bigger ships than previously. It is also planning to increase its capacities so that it can meet the needs of its current and future customers, in terms of volumes.



Good news for Port of Kalundborg: 51% increase in turnover

Denmark's Port of Kalundborg experienced a significantly higher cargo turnover in the first half of 2015, which of course is reflected in higher sales and improved results.

The cargo turnover in the first half was 765,300 tonnes, an increase of +51% compared with the same period last year. Major grain exports out of Kalundborg were the principal drivers of this figure. The Port of Kalundborg estimates a total bulk throughput of more than 1,000,000 tonnes of which the largest part is grain for export. The relatively large quantities of grain have been delivered by smaller coasters in Kalundborg from

other Danish provincial ports for transshipment to larger tonnage units for export. The Port of Kalundborg notes that even though it is the grain exports that draw the largest increase in cargo volumes, a significant increase in other categories such as other bulk and liquid chemicals have also contributed to the good result. Furthermore, the development in container turnover is favourable. All in all, this represents a very satisfactory result for the first half for the Port of Kalundborg.



PORT OF KOKKOLA *The Main Dry Bulk Port in Finland*



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The Port of Kokkola is ideally located, with rail and road connections to every part of Finland and to Russia. We are Finland's largest transit port delivering goods to and from Russia.

Continuous investments have made it the leading dry bulk port in Finland.

The draft of 13 m allows Panamax class vessels to load full loads of 75,000 ton, and larger vessels (120,000 DWT) have loads of more than 100,000 ton.



LNK Industries' ongoing infrastructure improvements strengthen the Port of Riga



Riga Bulk Terminal at the Freeport of Riga.

LNK Industries construction and manufacturing group continues to develop infrastructure objects in the Freeport of Riga in Latvia.

The Freeport of Riga is a significant part of global and regional cargo supply chains and passenger traffic network in the Baltic Sea region, providing safe and reliable services. An integral part of the city, the port makes a strong contribution to the growth of Latvia's economy. The port is driven by high performance standards and continuously strives to improve both the quality and breadth of services to clients.

LNK Industries will continue to develop the Freeport of Riga as a leading port of the Baltic States and as a source of real prosperity for Latvia. To ensure a bright future, it will:

- ❖ strengthen the customer base and seek to avoid dependency on any one cargo type;
- ❖ develop a sustainability framework to ensure environmental and social issues are fully integrated in its business;
- ❖ invest in new technologies and employ innovative approaches which enhance the quality and efficiency of LNK Industries' services; and
- ❖ work closely with the government of Latvia, the city of Riga and its inhabitants to create a seamless, integrated transport infrastructure.

Negotiations on the increase of the capacity of the already existing objects, as well as on the construction of new cargo transshipment terminals, are under way.

In the Freeport of Riga, it is planned to develop the potassium terminal with a capacity of two million tonnes. Within the terminal, the cargo will be transported via railway, will be stored at the terminal and then loaded on ships for export. It is planned to service ships with capacities of up to 60,000dwt.

Preparations for the construction project of the grain terminal for sea shipping of the grain crops grown in Latvia are under way.

LNK Industries team in front of the Freeport of Riga.



Klaipeda State Seaport – the pride of Lithuania



Klaipeda Port, with its ever-increasing capacity, is a source of pride in Lithuania and the Baltic Sea countries. Klaipeda is a core port in the Trans-European Transport Network (TEN-T) and a wide transit link between European Union and CIS countries. An efficient maritime industry makes the port a catalyst for Lithuania's economy.

HIGHLY COMPETITIVE

Average annual growth of bulk cargo handled in the Klaipeda Port has been 11.12% over the past ten years. This figure shows clearly the success of the port's continually increasing specialization and competitiveness.

OPTIMAL USE OF SPACE

Technical facilities of the Bulk Cargo Terminal

The dry bulk terminals in Klaipeda Port are extremely efficient in their use of space. For instance, the terminal occupying 50,000m² (425-metre berth with 13 metres of water depth at the berth, making it possible to handle vessels with maximum draughts of up to 11.5 metres) handled 6,324,494.90 tonnes of

dry bulk in 2014, meaning that it achieved a land use efficiency at the quay of 126.5 tonnes per square metre.

The warehousing facilities are located adjacent to berths and include five covered hipped-roof warehouses of arched type with a total capacity up to 100,000 tonnes of uniform mineral fertilizers.

Two railcars unloading stations are able to unload four railroad wagons at a time, with a total unloading rate of 450 wagons a day.

The terminal is capable of loading two dry bulk cargo vessels at a time by using its own shore-based loading equipment with capacities of 750tph (tonnes per hour) and 1,200tph.

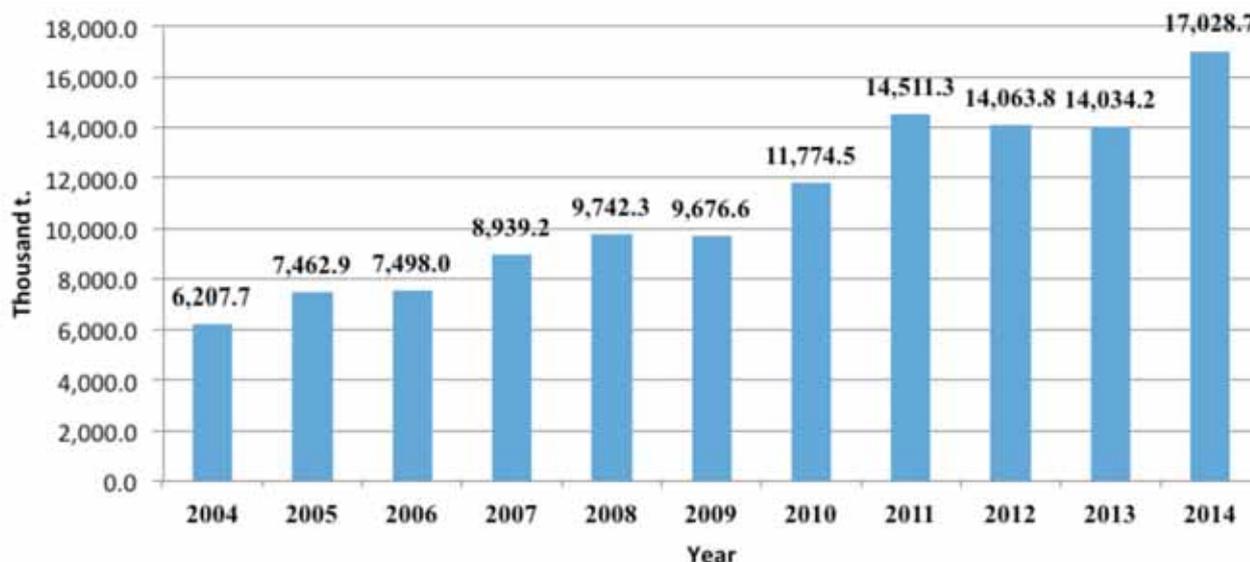
INNOVATIVE TECHNOLOGY

Since 1992, the Bega company has handled the greatest volumes of diverse bulk cargo in Klaipeda Port.

The company specializes in handling dry and liquid fertilizers, minerals, agricultural products, oils, cement, soda ash and other bulk cargo, warehousing these cargoes in its own terminals.

The total length of deep water berths is almost 2,000 metres.

Growth of dry bulk handled in the Port of Klaipeda



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Klaipeda achieves 3.5mt turnover in August

In August of 2015, the total throughput at the Klaipeda Port reached 3.15mt (million tonnes).

Preliminary data suggests that cargo turnover in Klaipeda Port in August this year increased by 16.8%, or 452,000 tonnes to 3.15mt, compared with August 2014. The previous record was reached in 2012, when the aggregated throughput at the port was 3.04mt.



YEAR-ON-YEAR CHANGES IN THE OVERALL TURNOVER IN AUGUST OF 2015 ACCORDING TO CARGO TYPES:

- ❖ **liquid cargo:** 855,200 tonnes were handled, an increase of 46%, or 279,000 tonnes, year-on-year;
- ❖ **general cargo:** 910,000 tonnes were handled, a decrease of -3.9%, or 36,900 tonnes, year-on-year;
- ❖ **dry and bulk cargo:** 1,385,300 tonnes were handled, an increase of 17.9%, or 210,000 tonnes, year-on-year.

During the period January to August this year, cargo handled at Klaipeda Seaport reached 25.37mt, an increase of 9%, or 2.1mt, compared with the same period last year.

Depth at the berths is 11.5 to 13 metres. Storage capacity for dry bulk products in covered warehouses is 525,000 tonnes.

The company operates a modern and efficient port handling equipment: powerful shiploaders, cranes, conveyors, elevators, covered rail loading and unloading stations, etc. It uses the developed inner railway network and its own locomotives. All those factors ensure rapid and high-quality cargo handling services using all possible technological schemes.

UNIQUE DRY BULK CARGO TERMINAL

Technologically (technologies are invented by engineers of this stevedoring company), the terminal is able to handle exports and imports simultaneously. The terminal complex consists of two connected warehouses with a total floor area of 20,000m² and 160,000m³ volume of storage, covered railway wagons and trailers loading/unloading station, high-productivity mobile shiploader and 120-tonne lifting capacity cranes on the pier. Warehouses, loading/unloading stations and the pier are connected with two-way belt conveyor galleries. The warehouses are divided into eight separate sections, which can accommodate cargo of different types.

Terminal capacity and technical capabilities enable the company to carry out full-fledged hub-port functions and to distribute the large quantities of bulk from Post-Panamax type ships to smaller vessels over the Baltic ports.

Such a modern, technologically equipped terminal providing diverse options has never been seen in other Baltic ports.

INERT BULK CARGO TERMINAL

It is possible to store up to 120 000 tonnes of cargo in the four sections of this terminal: apatite, phosphorus, and other bulks.

The loading process is automated, an exact and productive technological software is used. There are systems for automated dust collection; weighing; and crushing. Mechanisms to sift and collect metal parts are installed in the conveyor lines.

There is a modern loading station for soda in the inert materials terminal, which makes it possible to preserve the features of the cargo during loading under any weather conditions.

DRY BULK FERTILIZER TERMINAL

There are mechanized covered warehouses with capacities of 35,000, 40,000, 50,000 and 60,000 tonnes in the dry fertilizer terminal. There are also three separate wagon unloading stations, transporter galleries, and two mobile loaders. With the help of mobile fertilizer loaders that are mounted on the berths No. 69 and 72, cargoes are loaded to all large tonnage vessels without changing the mooring place of a vessel.

Separate sections for the storage of different types of fertilizers are in the covered warehouses.

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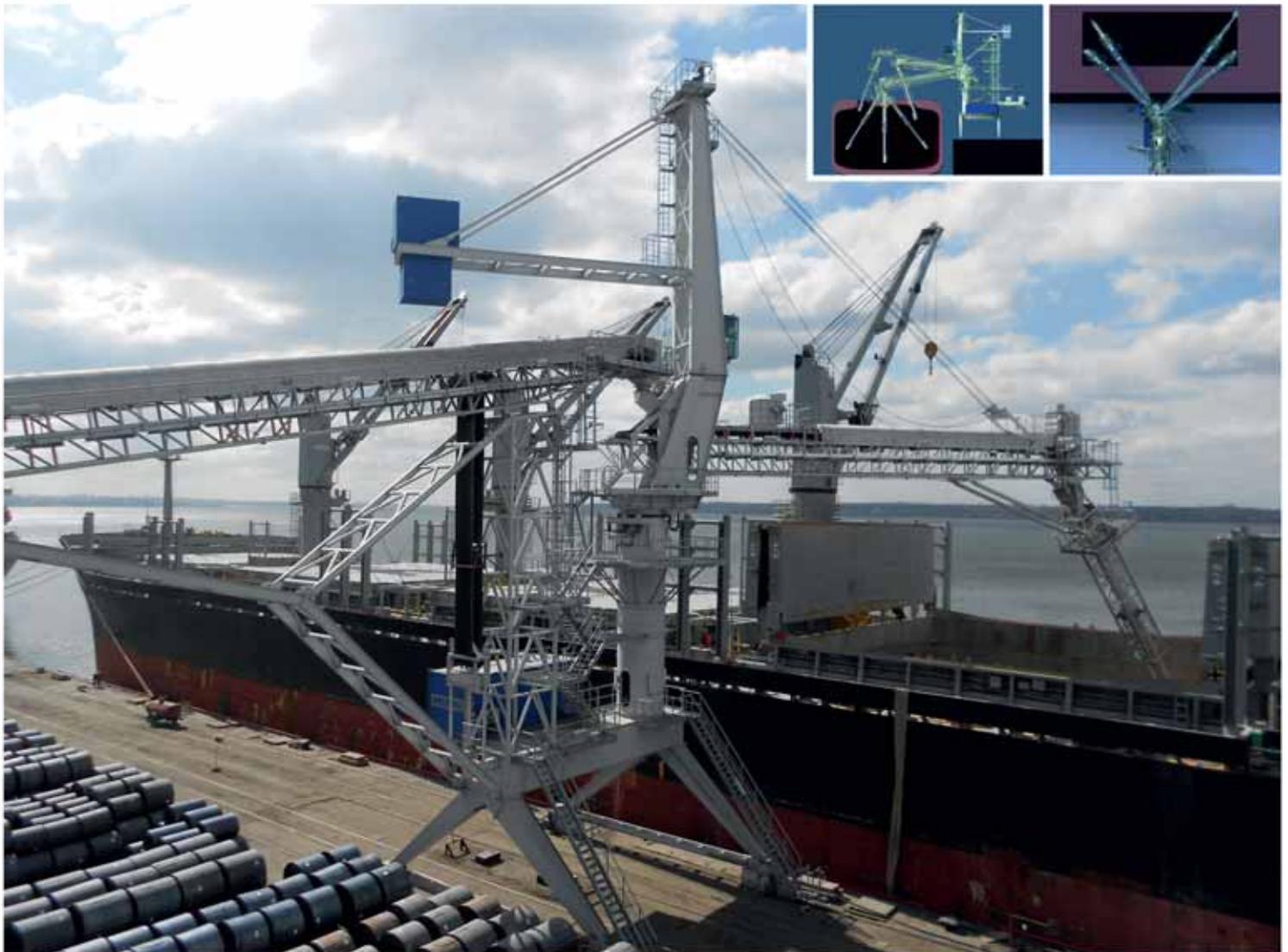
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