



# DRY CARGO

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Devise, Design and Supply  
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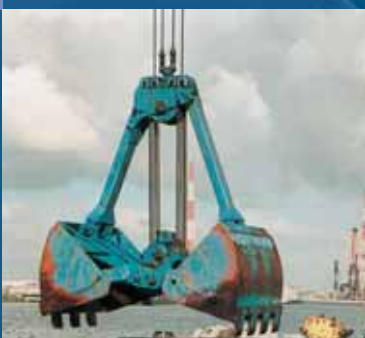
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SEPTEMBER 2015 issue

featuring...



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# Fading prospects for dry bulk trade growth

**E**arlier optimism, about a sizeable increase in global seaborne dry bulk trade during 2015 as a whole, has faded in the past few months. Imports of commodities into many countries are still growing, but negative changes have become much more prominent. A further steep decline in China's huge coal imports is especially notable.

The world economy's performance is providing only limited extra support for trade movements. Several recent forecasts indicate a slightly higher global economic growth rate this year. Modest acceleration in the advanced economies group, led by improvements in the USA and eurozone, is envisaged. However, prospects for some emerging economies have deteriorated, accompanied by far greater uncertainty about China's outlook.

## IRON ORE

World seaborne iron ore trade growth in 2015 may prove quite modest, as shown by the estimate in table 1, after many years of rapid expansion. A 22mt (million tonne) or 2% rise to 1,368mt may be seen this year, although some forecasters are more optimistic, assuming a pick up in the remaining months. The dominant influence is China's imports, now comprising almost 70% of the global total. Changes in other countries' purchases have become less significant.

Calculations for China, pointing to further substantial enlargement of imports, are mainly based on an expected continued substitution of high-cost Chinese domestic iron ore supplies with lower cost international material. But that substitution effect seems to be faltering. Among other major importers including Japan and European Union, positive influences are limited.

## COAL

A long uptrend in global seaborne coal trade was halted last year when the volume diminished slightly. Another similar decrease of about 24mt or 2%, down to 1,148mt, is envisaged in 2015. Both coking coal and the much larger steam coal category seem likely to experience a decrease.

In a number of countries coal import trends are still looking positive. One prominent example is expectations of

sustained strong growth in India, where consumption is rising vigorously, especially steam coal usage, amid growing dependence on foreign suppliers. Conversely, there are clear signs of weakening imports elsewhere, which probably will more than offset supportive influences. China, in particular, is seeing a dramatic downturn, reflecting policies promoting cleaner fuels.

## GRAIN

Forecast changes in world grain, including soya, trade are somewhat speculative. Crucial weather patterns, affecting domestic harvests in importing countries and exporters' harvests are largely unpredictable. Based on highly tentative assumptions about these factors, grain trade's growth trend could be maintained in 2015, at a slower pace than seen in the previous twelve months.

During this year global seaborne grain trade (including wheat, corn and other coarse grains plus soyabean) could be marginally, by 1%, larger at 390mt. Higher imports of grains and soyabean into China are a noticeable feature, while some other buyers in Asia, the Middle East area, and North Africa are providing additional support.

## MINOR BULKS

Approximately one-third of seaborne dry bulk trade is comprised of the extensive and varied minor bulks sector. Some elements such as steel products and forest products are very substantial and, arguably, not minor. Although calculations are complex and provisional, it appears that overall growth last year was minimal, resulting in a total of just over 1,500mt. Resumed but probably slow enlargement could be seen in 2015.

## BULK CARRIER FLEET

Clear signs suggesting a continuing slowdown in the world bulk carrier fleet's growth are visible. After expanding by over 4% last year, deadweight capacity in 2015 is forecast to grow by 3%, reaching 779m dwt at end-year, as shown in table 2. New capacity entering the fleet (newbuilding deliveries) may increase, compared with the previous twelve months, but much higher scrapping of old or uneconomical vessels is set to offset a larger proportion.

**TABLE 1: WORLD SEABORNE DRY BULK TRADE IN 3 MAJOR COMMODITIES (MILLION TONNES)**

	2010	2011	2012	2013	2014	2015*
Iron ore	1005	1069	1124	1210	1346	1368
Coal	954	1014	1111	1191	1172	1148
Grain (including soyabean)	297	313	329	355	385	390
<b>Total major bulks</b>	<b>2256</b>	<b>2396</b>	<b>2564</b>	<b>2756</b>	<b>2903</b>	<b>2906</b>
% growth from previous year		6.2	7.0	7.5	5.3	0.1

source: Bulk Shipping Analysis estimates and forecasts \*forecast

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

	2010	2011	2012	2013	2014	2015*
Newbuilding deliveries	80.9	100.0	100.2	62.8	48.1	55.0
Scrapping	6.5	23.2	33.4	23.1	16.2	32.0
Losses	0.4	0.5	0.1	0.4	0.1	0.2
Other adjustments/conversions	4.4	4.4	-1.1	-0.1	0.0	0.0
Net change in fleet	78.4	80.7	65.6	39.2	31.8	22.8
<b>Fleet at end of year</b>	<b>539.1</b>	<b>619.8</b>	<b>685.4</b>	<b>724.6</b>	<b>756.4</b>	<b>779.2</b>
% growth from previous year		15.0	10.6	5.7	4.4	3.0

source: Clarkson Research (historical data) & BSA 2015 forecast \*forecast

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# China dry bulk imports: a sliding trend

Signs of weakness in China's dry bulk commodity imports are very prominent this year. Growth abruptly slackened last year to 2%, compared with the preceding twelve months, following much higher expansion rates previously. It now seems possible that the 2015 total will show an actual reduction, unless there is a solid pick-up over the remaining months.

The changing pattern is having a profound effect on global seaborne dry bulk trade. Some spectacular rises in imports into China over the past decade have boosted the annual total from about one-eighth of world volume, to over one-third.

Consequently the present slackening, when coupled with limited growth in import volumes elsewhere, is being closely watched.

Part of the explanation is slowing growth in economic activity. Although much more specific factors affect individual commodities, a decelerating Chinese economy is having a broadly negative impact. Slacker demand for the products of industries which rely heavily on imported supplies of raw materials and fuels is apparent.

A revised assessment published recently (mid-August) by the IMF suggested that GDP growth in 2015 could slow to 6.8%, from 7.4% last year, followed by a further slowdown to 6.3% next year. The transition to a 'new normal' and sustainable pace in China is set to continue, as intended by the government. One desired outcome is to rebalance the economy, reducing over-dependence on capital investment and exports, and increasing the emphasis on consumer spending.

## IRON ORE IMPORTS FALTERING

After the strong rise in 2014, another large increase in iron ore imports into China this year seemed likely, but confidence in that outcome has faded. These ore volumes comprise about two-fifths of the country's entire dry bulk imports, and also comprise over two-thirds of global iron ore trade, so their significance is enormous.

During the first seven months of 2015, China's iron ore imports totalled 539mt (million tonnes), a minimal reduction of under 1% compared with last year's same period. The slight weakening occurred amid lower steel production, which was down by 2% to 476mt, although the steel estimate may be revised upwards when more complete information becomes available.

Little or no potential for steel output to rise this year has been visible for some time, given the clear signs of weakness in consuming industries, especially construction activity. However, despite the resulting constraints on iron ore consumption, analysts expected imports to grow further, perhaps quite rapidly. Much lower prices for foreign ore supplies, caused by greatly enlarged availability, were expected to continue displacing higher priced Chinese domestic supplies.

## COAL IMPORTS DECLINING

Imports of coal into China remained on a downwards trend during recent months. In the January–July 2015 period total imports,

including low-grade lignite, reportedly declined by a massive 62mt or 34%. From 183mt in the same period last year, the volume was down to 121mt.

Reduced steel production is one influence, reflected in lower coking coal demand. But a much bigger factor is the remarkable changes taking place in the power generation sector, especially affecting coal-fired electricity production. Accompanying a slowdown in overall energy usage and power demand, caused by the economy's deceleration, a fundamental shift towards cleaner energy sources is occurring.

China's steam coal consumption and imports have been weakened by rising hydro-electricity generation capacity and output, aided by abundant rainfall. Increased emphasis on gas, nuclear power and renewable energy sources has been noticeable as well, amid the government's efforts to reduce both air pollution in cities and other environmental damage associated with coal burning. Moreover, tougher controls on the usage and importing of low-quality coal grades have been introduced.

## GRAIN AND SOYA IMPORTS BUOYANT

Contrasting with foreign purchases of dry bulk minerals, China's import demand for agricultural commodities remains well supported, with clear potential for further growth. Cereals and oilseed imports strengthened again last year and seem likely to maintain an upwards trend in 2015.

Imports of soyabeans by Chinese buyers, the largest part of this sector, are forecast by the US Dept of Agriculture to increase strongly by 9% in the 2014/15 trade year ending this month, reaching 77mt. A smaller 3% rise is tentatively predicted for the following 2015/16 year. Imports of wheat and coarse grains in the period now ending are estimated at over 23mt, a 20% increase, and these are expected to stay at around that volume in the next twelve months.

Expanding soya products (meal and oil) consumption is the main influence driving soyabeans imports higher. Domestic production of soyabeans in China has not risen in recent years. While grain harvests have increased, consumption growth patterns were sufficient to underpin larger foreign purchases. Currently, a key feature is much larger sorghum purchases for livestock feed.

## MINOR BULK PATTERNS VARY

Numerous other cargoes form part of China's dry bulk commodity imports and, as a group, the overall volumes are substantial. Two of the largest components are nickel ore, used in stainless steel production, and bauxite together with the processed form alumina, used in aluminium production.

Following last year's sharp falls in both nickel ore and bauxite/alumina imports, partial revivals during 2015 may be seen. The outlook for a range of commodities including other 'minor' ores and minerals, steel products, forest products, scrap iron, petcoke and fertilizers is mixed.

*Richard Scott*

## CHINA'S DRY BULK IMPORTS (MILLION TONNES)

	Main bulk commodities					
	2010	2011	2012	2013	2014	% change**
Coal*	184.6	222.2	288.9	327.2	291.6	-10.9
Iron ore	619.1	687.0	745.5	820.3	933.1	+13.8
Soyabeans	54.8	52.6	58.4	63.4	71.4	+12.6
Bauxite/alumina	34.7	47.1	45.1	75.4	41.8	-44.6
Nickel ore	25.1	48.3	65.0	71.2	47.7	-33.0

source: China Customs, USDA, BSA \*coal includes lignite \*\* 2014 compared with previous year





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# Global grains and oilseeds

Maria Cappuccio

## Ample feed grains supply but slower global growth may temper demand

In the latest economic assessment of the global economy, the international monetary fund (IMF) project global growth of 3.3% in 2015, lower than anticipated, and below 2014. While global growth is expected to strengthen next year, especially in the advanced economies, the continued slowdown in emerging markets reflects several factors including, lower commodity prices, tighter external financial conditions, structural bottlenecks, rebalancing in China and economic distress related to geopolitical factors, the IMF see a rebound in activity in a number of distressed economies resulting in a pickup in global growth, forecast at 3.8 percent in 2016.

### DEVALUATION OF CHINESE YUAN STUNS MARKETS

In an exceptional week, the Peoples' Bank of China (PBOC), stunned financial markets by devaluing the yuan on 11 August, following a stream of poor financial results and weak trade data;

two subsequent devaluations followed and triggered the biggest asset sell-off in over 20 years — turbulent stock market reaction and the lack of government control to stabilize them, dented confidence as investors exited yuan-denominated assets, for assets in other currencies, particularly the US dollar. Since the devaluation, the yuan has fallen by over 4% to the dollar, increasing competitive pressure on its Asian neighbours, and on other emerging countries, including Russia, many of them commodity exporters — their currencies already struggling with tumbling commodity prices and the imminent prospect of a US interest rate hike possibly as early as this month.

### RECORD 2.5BN/T GRAIN AND OILSEED HARVEST FORECAST IN 2015

The decision to devalue the yuan, which makes Chinese exports more competitive, while raising the cost of imported

## MAJOR FEEDSTUFFS — PRODUCTION, USE, FEED & STOCKS 2014–2015/16 (MT)

	Prod 14/15	Prod 15/16	Use 14/15	Use 15/16	Feed 14/15	Feed 15/16	Stocks 14/15	Stocks 15/16
Wheat	725	727	709	715	135	136	210	222
Coarse grain	1,295	1,277	1,273	1,282	760	771	232	227
Total grain	2,020	2,004	1,982	1,997	895	907	442	449
Oilseed/oil meals feed	537	529	437*	446*	286**	297**	94	96

Source: IGC/USDA-Prod-mainly harvested Jul-Dec/Local Marketing years \*Crush/Oilseed/Meals-Ex. Fishmeal

commodities like grain, oilseeds and feed ingredients, coincided with the release of USDA's crop report, which confirmed that despite adverse weather conditions during the growing season, and the continuing concern over *El Niño*'s effect in some regions, global grain and oilseed crops, while 1% below last year, are on track, to produce another 2.5bn/t harvest, for the third consecutive year. The prospect of large grain and oilseed supplies led to steep falls in prices across the grain/oilseed complex. Feed demand is expected to show a modest rise compared with the previous year's all-time high, with a marginal increase in food and industrial demand.

#### FEED USE OF GRAINS AND OLSEEDS FORECAST HIGHER IN 2015/16

Global wheat and coarse grain output is forecast at over 2bn/t in 2015, below last year's exceptional record output, mainly due to smaller corn and barley crop, partially offset by a larger sorghum crop, with better crops in Argentina, India, Mexico and the US. There is a small increase for feed wheat and higher feed use of coarse grains by Brazil, China and the US, driving global consumption for grains, forecast to rise to 199mt (million tonnes). Global supply of grains are more than adequate to meet demand, while ample stocks are expected to rise to 449mt by the end of 2015/16. The global oilseed crop is forecast 8mt lower than last year at 529mt, mostly due to smaller crops of rapeseed, cottonseed and sunflowerseed; unlike last year, better crush margins in the first half of the year are expected to remain positive, and with lower prices, feed consumption of oil-meals are forecast to rise to 297mt reflecting rising demand in China, and in a number of other countries.

#### SMALLER CROPS IN THE EU AND BETTER CROPS NORTH AFRICA AND MIDDLE EAST

USDA forecast global wheat output at 727mt, eclipsing last year's record, albeit with some quality issues, while quantity of feed wheat expected to be higher. Smaller crops in the EU (148mt), Canada (27mt) and India (90mt) are offset by better crops in Russia (60mt), China (130mt), the US (58mt), Turkey (20mt) and Morocco (8mt) and in a number of other countries. Feed usage of wheat is forecast at 136mt, slightly above last year; while a much reduced EU corn crop, hit by scorching temperatures in June, may provide scope for increasing feed wheat use in EU animal feed rations.

#### ARGENTINE CROP LOWER WHILE AUSTRALIAN WHEAT OUTLOOK IMPROVES

In the Southern Hemisphere, Buenos Aires Grains Exchange

confirmed that Argentine wheat plantings on 3.7m/ha, are lower than last year, with dryness in northern areas cutting yield potential.

Disenchantment with government policy, low wheat prices and restrictions on wheat exports encouraged growers to favour barley and other crops over wheat; with forthcoming elections in October growers look for change of leadership to improve outlook. USDA forecast the Argentine wheat crop at over 11mt — other analysts forecast the crop just over 10mt flagging dryness, smaller area and reduced inputs affecting yields. The outlook for Australia's 2015 wheat crop has improved as the worst fears prompted by *El Niño*, recede. USDA forecasts the Australian crop at 26mt, other analysts while brokers Pentag Nidera forecast a crop around 23–24mt. Although the continuing threat of *El Niño* for Australian crops remains throughout the growing season, and regional dryness remain a concern, so far precipitation has been timely and many crops are said to have excellent yield potential.

#### BETTER DOMESTIC WHEAT HARVESTS REDUCE THE NEED FOR IMPORTS IN 2015/16

Despite some production problems this year, better crop prospects in a number of countries including Iran, Morocco and Turkey, have reduced the need for imports partially offset by small increases noted for China, India — due to tight supplies of high-quality wheat-and the EU — mostly cheap feed wheat from Ukraine. The global wheat trade is expected to contract by 4mt to 157mt in 2015/16, intensifying fierce competition between rival exporters — wheat exports are forecast lower for Canada and the EU, but raised for the US, Australia, Argentina, Russia, Ukraine and Kazakhstan. At a recent tender for wheat issued by Egypt's grain buyer the General Authority for Supply Commodities (GASC), the bids received totalled 1.4mt — Egypt eventually bought 120,000/t of Russian wheat at a cost \$198.73/t including freight—representing a price fall of \$6/t since late July, and the lowest purchase price since 2009/10.

#### BLACK SEA WHEAT TO DOMINATE WHEAT SALES

Black Sea countries' wheat, typically the price leader during the first part of the season, are forecast to export a record 42mt in 2015/16, almost 27% of the global exports; this year Russian exports have lagged due to the uncertainty surrounding the timing of the wheat export tax. Asian buyers in South Korea, Thailand and Philippines snapped-up early offers of 3mt cheap feed wheat for delivery between July and December — the Philippines buying 100,000/t of Ukrainian feed wheat for shipment in September and October at around \$210–220/t C&F (cost and freight), while CBOT's wheat September contract closed at \$5.03/bu (\$184.4/t — 18 August); with UK Feed wheat November contract at new lows of £115.50/t (\$181.41 — 18 August).

#### WORLD WHEAT PRODUCTION 2011–2015/16 (MT)

	2011/12	2012/13	2013/14	2014/15	2015/16
EU	138	134	144	156	148
E. Europe	3	4	4	4	4
CIS Baltic's	115	78	104	113	115
N & C America	83	92	99	88	88
S America	26	19	20	24	23
N East Asia	39	37	42	35	41
F East Asia	226	249	249	257	255
Africa	25	24	27	24	27
Oceanic	30	23	26	24	26
<b>Total</b>	<b>696</b>	<b>659</b>	<b>715</b>	<b>725</b>	<b>727</b>

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

#### WORLD WHEAT SUPPLY & DEMAND 2011–2015/16 (MT)

	2011/12	2012/13	2013/14	2014/15	2015/16
Production	696	659	715	725	727
Consumption	698	679	699	709	715
Trade	154	147	162	161	157
Stocks	198	177	193	210	222
Key exporters *	58	48	54	64	66

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

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



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## WORLD COARSE GRAIN SUPPLY & DEMAND 2011-2015/16 (MT)

	2011/12	2012/13	2013/14	2014/15	2015/16
Production	1156	1137	1281	1295	1277
Consumption	1155	1136	1238	1273	1282
Of which feed	657	669	737	760	771
Trade	133	132	165	167	168
Stocks	167	168	211	232	227
Key Exporters*	43	48	63	76	70

Source: IGC/USDA \* Argentina, Brazil, Ukraine, US

### LARGE SUPPLIES AND CONTROVERSIAL ESTIMATE FOR US CORN

In the USDA's latest, and somewhat controversial report, global coarse grain production is forecast at 1,277mt (corn 986mt, barley 139mt, sorghum 69mt), the year-on-year-decline due largely to a contraction in global corn output to 986mt; but it was the estimate for the US corn crop that drew most attention, being significantly higher than analysts and markets anticipated.

### FEED CONSUMPTION EXPECTED TO RISE

Coarse grain use is forecast to grow by 8mt to 1,282mt, with feed use forecast to rise by over 11mt above last year's exceptional level, to a record 771mt, offsetting a small reduction for food and industry. Global trade is expected to rise by 1mt to 168mt, led by a hike of 6mt to 15mt for corn imports into the EU, due to a poor domestic corn harvest. US coarse grain exports are forecast higher at 58mt, Black Sea 30mt (Russia 8mt Ukraine 22mt), Brazil 28mt, Argentina 19mt and Australia 7mt. Global coarse grain stocks expected to fall by 5mt to 227mt, with major exporter stocks down a similar amount.

### US CORN CROP CONUNDRUM?

USDA estimated US corn production at 348mt (13.7bn/bu) based on yields of 168.8 bu/acre. The forecast released in August, is the first of the growing season to be based on surveys of farmers and field observations and sharply exceeded analyst estimates of 338mt (13.3 bn/bu) on yields of 164.4 bu/acre, on both area and yield; when combined with better prospects for wheat and soybean output, large stocks and slow demand, led to a steep price fall. CBOT futures December corn contract fell from \$3.93/bu to a low of \$3.57/bu before closing at \$3.68/bu (Aug 12). The US corn crop at 348mt is 13mt lower than last year, smaller corn crops are also anticipated for Brazil 79mt, Argentina 25mt, the EU 62mt and in the Ukraine 27mt, partially offset by a record Chinese crop 225mt, and, better crops in India and Canada-global corn production in 2015/16 forecast at 986mt, 20mt below last year's exceptional harvest.

### RIISING STOCKPILES SUPPORT REVIEW OF SUBSIDIES FOR CHINESE CORN GROWERS

Both USDA and the International Grains Council (IGC) forecast a larger corn crop for China at 225mt, made possible by the generous level of government support to grain growers. Concerns about the high level of support for corn and the need to scale-back support are under review, with possible changes to be introduced next year, given that the policy has led to, a domestic price for corn well-above world market rates, rising imports of low-cost feed ingredients, like sorghum (not covered by quotas), and huge overpriced stockpiles of corn. By the end

of 2015/16 China's domestic corn stocks are forecast by USDA at 90mt, by IGC at 100mt while other analysts put the figure closer to 150mt.

### CHINA CALLS FOR IMPORTERS TO REGISTER (NON-QUOTA) FEED INGREDIENTS

However, in an exceptional week for commodity and economic activity, and following the devaluation of the Chinese yuan, the Chinese government also, announced that from 1 September 2015, importers of sorghum, barley, cassava and distillers' dried grains & solubles (DDGS) will need to register purchases. Unlike corn, currently these feed ingredients, are not subject to a quota system — although due to the higher price of domestic corn, imports of these feed ingredients have surged.

For some time, market speculation has been rife over what measures China would adopt to stifle rising imports of sorghum, up from 84,000/t (2011/12) to 11mt in 2015/16; barley up from 2.5mt (2011/12) to 7mt and DDGS 4-5mt in 2013/14, until imports were halted amid concerns about contamination with MIR 162, a Syngenta corn variety cleared in Washington but not in Beijing; this locked Chinese buyers, out of the US market. The variety was subsequently cleared and the problem resolved, but not without significant delays and huge costs. Imports of DDGS resumed at the turn of this year, with Chinese imports reaching an historic high in June of 967,529/t — as Chinese feed millers exploit relatively cheaper foreign supplies exacerbating the government's dilemma, the disposal of a mountain of over-priced, dubious quality, corn. US FOB (free on board) Gulf vessel prices (September) DDGS \$208/t (18 August).

### ROBUST OPPOSITION TO EPA'S PROPOSED CHANGES TO ETHANOL REQUIREMENTS

Corn for ethanol use, is forecast to rise by 1mt to 133mt to produce c.14.4bn gallons of ethanol and 40mt of DDGS for feed use in 2015/16. And, as in previous years, the ethanol industry continues to challenge the 'blend wall', which limits the amount of ethanol used to 10% in a blend with gasoline. This is seen by many ethanol supporters as a myth propagated by the US petroleum lobby, to prevent the take-up of blends with a higher ethanol content, like E15 and E85, even though, a much higher proportion of ethanol — up to 27% — is mixed with gasoline, and tolerated by regular vehicles in Brazil. A further challenge is the proposal put forward by the US Environmental Protection Agency (EPA), to cut the 21Bn/gallons of ethanol, mandated by the Renewable Fuel Standard (RFS), a programme signed into law (Energy Policy Act 2005), by almost 4bn/gallons, to 17bn/gallons of ethanol, to be blended with gasoline by 2016. The EPA proposal is seen as a barrier to the development of higher blends and weakens the mandated obligation on the petroleum industry, to utilize 36bn/gallons of bio-fuels by 2022. Unsurprisingly, the changes proposed have met with fierce opposition from US grain growers and the Renewable Fuels lobby—with the deadline for comments closed, a decision from the EPA is expected in November

### SHARPLY LOWER PETROLEUM PRICES IMPACT ETHANOL PROFIT MARGINS

Responding to questions from investors about the ethanol business, following presentation of ADM's second quarter financial results, which highlighted loss of profits in the ethanol sector and the impact of sharply lower petroleum prices, CEO Juan Luciano expressed confidence in ethanol in the medium-and longer-term. While the risk of higher imports with a strong



dollar was possible, US ethanol exports moved at an annualized rate of 800m/gallons and they continue to see international markets develop and identify ethanol as the most sustainable/low cost alternative to replace 6bn/gallons of methyl tertiary-butyl ether (MTBE) capacity. Regarding E15 and higher blends — ADM believes that USDA investment combined with the ethanol industry's efforts will ensure they play a more meaningful role possibly by 2017 or 2018.

#### DECLINE IN FOOD PRICES AFFECTING ALL MEAT CATEGORIES

The FAO meat price index averaged over 174 points in July, above June but down from 183 points in January, and, well below 2014 values; the decline affecting all categories of meat. International prices of beef moved up, offsetting a decline for pig and sheep meat, while poultry quotations remained stable. Prices of beef from Australia, in particular, rose, supported by stronger import demand from the US, Japan and the Republic of Korea, amongst others. Muted domestic demand for pig meat in some EU member states caused quotations to fall, with export prices following suit.

#### GLOBAL MEAT PRODUCTION DRIVEN BY PIG AND POULTRY IS FORECAST TO EXPAND IN 2016

Global meat production is forecast to expand in 2015 to 319mt (beef 68mt, poultry 112mt, pig 119mt sheep 14mt), 8mt up on last year, with the largest increases expected in China, the EU, US and Brazil, and mostly driven by pig and poultry meat. Government support policies are anticipated to boost pig meat output in China to 58mt, almost half of the world total, with similar growth rates forecast for Vietnam, Philippines and Indonesia; while the US, Japan and the Republic of Korea are set to recover following last year's outbreaks of porcine endemic diarrhoea (PED), which reduced piglet numbers. Brazil, Canada and Mexico, are set to increase output, due to lower feed costs. Steady growth is also anticipated for Mexico, underpinned by improved genetics and productivity with further expansion in the EU. In the Russian Federation, government policies favouring large-scale farms resulted in a doubling of production over the decade, and likely to increase in 2015, following the ban imposed last year, on pork imports from the EU and Canada that previously provided two-thirds of Russian imports.

#### RUSSIA EXTENDS ONE YEAR BAN ON FOODSTUFFS TO 2016

Trade is predicted to slow to over 31mt in 2015, constrained by limited export supplies and subdued import demand — while growth is forecast for beef, pigs and poultry, it is reduced for sheep meat. For beef, much of the 2015 expansion in trade is likely to be met by India and Brazil. Russia extended the ban on food imports of meat, fruit, vegetables, fish, milk and dairy, worth \$9bn from the US, EU, Australia Canada and Norway, to 2016.

#### LARGE SUPPLIES AND REAL DEPRECIATION MAKE BRAZIL CHEAPEST SOURCE OF CORN

Quotes for corn from all origins are down, generally touching five-year lows — US corn quotes dropped over \$30/t to \$170/t on generally favourable growing conditions, a stronger dollar, and competition from large South American supplies. Argentine and Brazilian quotes — helped by a near 23% drop in the value of the Brazilian real, making Brazil the cheapest source of corn — both origins maintaining a discount to US prices. South Korea's Feed Leaders Committee (FLC) purchased 60,000/t yellow corn to be sourced from optional origins in a tender for up to 140,000/t (13 August). The corn was purchased at \$187.50/t

C&F for arrival on 16 February, plus a \$1.50/t surcharge for additional port unloading. Corn futures improved over the week, with buying tied to ideas that the US corn yield will turn out significantly lower than the USDA estimate — CBOT December contract closed at \$3.77/bu (\$148.44) (18 August).

#### GLOBAL BARLEY CROP LOWER BUT FEED USE LOWER

Smaller harvest is expected in the EU 57mt, Russia 17mt, Canada 7mt, partially offset by larger harvests in Argentina 3mt, Australia 9mt Morocco 4mt and Turkey 7mt with output forecast at 139mt down over 1mt from last year. Feed use is forecast lower at 94mt, with trade forecast down to 25mt; China due to imports of competing feed ingredients are lower at 7mt, and Iran 1.5mt due to better harvests, while Saudi Arabia imports are forecast to rise to 7mt. Like other feed grains, barley values are lower than last year — quotes for French barley FOB Rouen (\$177/t-Aug 18); UK Feed Barley Merchant Nov £94-104/t (\$147.06-\$162.71/t-Aug 13).

#### CHINA'S SORGHUM IMPORTS EXPECTED TO RISE TO 11MT IN 2015/16

An increase in the planted area for sorghum, and better crops in the US 13mt, Mexico 8mt, India 5.5mt, Argentina 4.5mt and Australia 2.1mt, boost global output to 69mt over 6mt up on last year. Rising feed/food/industry demand, notably in China, Mexico, India and the US, to increase consumption to 68mt, with global trade up by 3mt to 14mt reflecting rising imports, mostly feed forecast at 11mt for China-US sorghum-October delivery FOB Nola \$217.72/t (13 August).

#### USDA SOY CROP FORECAST WELL ABOVE MARKET EXPECTATIONS

Despite weather concerns, USDA raised its forecast for both the area and yield for US soybeans, to well above what markets were anticipating, lifting global output of soybeans to a record 320mt. Following the report, CBOT soybean futures (November) contract fell from a high of \$9.76/bu to close at \$9.10/bu (12 August). Since then, reports on the developing crop remain upbeat and together with concerns about future exports to China, weigh heavily on prices. CBOT soybean futures (Nov) contract futures closed lower at \$8.935/bu (\$328.27/t — 19 August).

#### RECORD SOYBEAN CROP BUT OUTPUT FOR RAPE, SUNFLOWER AND COTTON LOWER

Record crop for soybean 320mt, and better crops for groundnut

#### MAJOR OILSEED SUPPLY & DEMAND 2011-2015/16 (MT)

	2011/12	2012/13	2013/14	2014/15	2015/16
Production	448	476	506	537	529
of which					
Soybeans	240	269	283	319	320
Crush	395	397	420	438	446
Consumption*	258	259	272	287	297
Trade Meals*	78	76	80	83	86
Trade Seeds	111	118	133	144	145
Stocks	67	68	78	94	96
of which (soybeans)					
key exporters**	34	40	45	58	55

Source: USDA/\*Meals cons/trade-excl. fishmeal

\*\*Argentina, Brazil, US

41mt, palm kernel 17mt and copra 6mt, are partially offset by a reduced crop of rapeseed 65mt — due to reduced crops in Canada, Australia, the EU, Belarus, and Ukraine; and smaller crops for sunflower 39mt and cottonseed 41mt. Oilseed production is forecast to fall to 529mt in 2015/16, 8mt below last year's exceptional harvest but still the second largest crop on record; global crush is expected to increase to 446mt driven by soybean demand, with greater uptake of oil-meals up 10mt to 297mt, mostly reflecting rising protein demand in China, and in a number of other countries. Global trade in oilseeds is forecast to rise by 1mt to 145mt with oilseed stocks expected to close higher at 96mt; reflecting ample stocks of soybeans while other oilseed stocks are tighter—rapeseed stocks are halved close to just over 3mt, sunflowerseed under 2mt and cottonseed 1mt.



#### ROBUST SUPPLIES AND A DEPRECIATING REAL LIFT SOUTH AMERICAN SOY EXPORTS

With large soy crops for the US 107mt and South America (Brazil 97mt and Argentina 57mt), global soybean trade is forecast to rise to 127mt, up on last year, as record South American supplies, lower prices and tighter supplies for rape and sunseed, may spur additional sales, with significant increases in sales to China, the EU, and Iran anticipated. The US expects a slow start to the season — strong competition from record South American supplies and a significant weakening of the Brazilian real are contributing to the sluggish pace of exports. Global soybean stocks are forecast to fall by 6mt to 80mt reflecting strong growth in protein meal for animal feed and vegetable oil consumption. USDA forecast the US season average farm price for soybeans at \$9.15/bu (\$336.17/t).

#### RIISING DEMAND FOR PORK TO DRIVE SOYMEAL CONSUMPTION

China — the world's largest importer of soybeans — is expected to import 79mt of soybeans, with domestic soybean crush forecast at 80mt 2015/16, in response to high demand for soymeal from China's huge domestic pork industry, and supported by rising pig-meat prices, which year-on-year, rose by 16.7%. According to Shanghai-based analysis group JCI

Consulting, the average profit margin for hog producers, having recovered to break-even in June, doubled from 400 yuan per head, to 800 yuan per head, in the week to 24 July. The USDA bureau in Beijing confirmed that protein meal demand continues to be driven by growing animal producing capacity, scale animal farming and use of industry feed; with rising demand for pork at 3.3% a year for the next decade, to underpin demand for feed, given the government's high priority for domestic animal production.

#### UNEXPECTED YUAN DEVALUATION CREATES UNCERTAINTY

Although strong demand for livestock feed from China's swine sector suggests the appetite for soybeans will persist, the uncertainty caused by the unexpected devaluation of the Chinese yuan that began on 11 August, stunned global financial markets and has had a significant impact on a large number of countries and their currencies, as they digest the implications.

For commodity processors, before the yuan devaluation Wilmar chairman and chief executive Kuok Khoon Hong said the group "expects crushing margins in China to remain positive for the rest of the year". This view is shared with US-based oilseed processor Bunge which forecast Chinese soybean crush margins for the second half of 2015 at \$15/t, down from the \$30/t enjoyed in the first half a year, and better than the very narrow or negative margins seen last year. However, some traders post devaluation, forecast a significant cut in crush-margins and expect imports to slow until the uncertainty surrounding devaluation becomes clearer.

## Indian government hopes to barter sugar surplus 'a non-starter' say experts

The Indian government put its foot in its mouth when recently it suggested that the crisis in the country's sugar industry would be mitigated to a large extent by exporting 4mt (million tonnes) of sugar by way of barter trade, writes *Kunal Bose*. India is highly dependent on imports of petroleum, edible oils and pulses, while at the current sugar season ending in September, the country will have an inventory of around 11mt of the sweetener. At the start of the new season, the required inventory is about 7mt to meet local demand till cane crushing picks up. All this must have led New Delhi to believe that by way of barter transactions, the sugar industry could be relieved of mountains of surplus

haemorrhaging all cane crushing factories across the country.

The crisis in the industry is so deep that factories are as a matter defaulting in making payments to cane growers. At one point in the current season (October to September) unpaid cane bills amounted to nearly \$3.5bn. Delays in settling cane bills are leading a growing number of growers, unable to meet their financial and social commitments, to commit suicide. As it would happen, the government instead of finding a permanent solution to the crisis that periodically visits the industry offers palliatives in the form of loans to factories which in many instances could not be availed because of conditions.



“Sugar has been in a free fall because of global surplus. At New York ICE futures, sugar is done at around 10.50 cents a pound, a six-year low. In the medium term, there is unlikely to be a trigger to give a boost to sugar prices. The International Sugar Organization (ISO) has revised global surplus for 2014/15 to 3.33mt from the earlier 2.22mt. What will continue to impact the market bearishly is the 25mt accretion in global sugar inventory in the past five years. Even if there is going to be a deficit of 2.49mt in 2015/16, the market will remain amply supplied because of the inventory,” says Om Prakash Dhanuka, a senior Indian industry official. Abundant availability of sugar at prices which do not cover its production costs, particularly in India where cane prices in many growing states are arbitrarily decided to win favours of large community of farmers but without any consideration at what rates the sweetener is sold, does not make barter work.



“Why should any country with exportable surpluses of much better marketable commodities at this time be ready to exchange these for sugar that may not have found price bottom as yet?” asks Dhanuka. Grains trade expert Tejinder Narang is on the same page as Dhanuka. Narang says “sugar is largely traded among private parties based on criticality of international parities. Induction of two governments, their official agencies, banks with escrow accounts, etc, to facilitate barter in export process and involving non-sugar related private/public entities... is the best way to abort sugar export.” No wonder using barter to sell as much 4mt of sugar has proved to be a non-starter, causing much embarrassment to New Delhi.

Besides the proposed export medium barter, where New Delhi has also gone wrong is not to spell out that the government will pay for the “difference in sugar production costs and export price.” Naturally the industry, which continues to delve deeper in the red, has remained demonstrably unenthusiastic about bartering sugar for other commodities in the absence of government commitment to underwrite losses. What then is the way out of the crisis? Dhanuka says, “export we must. The country’s outlook for other crops in the current season (July to June) remains a cause for concern. But we are destined to have bumper sugar production in the season beginning October to make it sixth year in a row. Looking at the standing crop across the country, my own estimate is we can have record production of 29mt in 2015/16 with a season opening inventory of 11mt. Unless we are able to export 4mt to 5mt, for which government support is sorely needed, the domestic market will remain in the dumps.”

Analysts are in agreement with Dhanuka, a former president of Indian Sugar Mills Association, that the only way to export is for government trading agencies like STC and MMTC to lift sugar from factories at cost price and then sell it in the world market. This was done in the past with success. To the extent exports happen this way, factory capacity to settle cane bills in time will improve. Interestingly, in spite of factories not settling cane bills in time, growers are not bearing grudges against the industry. Their wrath is rightly directed against the government. This is evident from joint demonstrations by factories and farmers held in New Delhi in more than one occasion protesting

against government inaction.

#### DIFFICULT MONSOON ONCE AGAIN

More than half of the country’s farmland being dependent on rains, the nearly 10% deficit in monsoon rains between June and third week of August is to hit hard at least four states, namely, Bihar, Karnataka, Maharashtra and Uttar Pradesh and five crops jowar, soybean, tur, maize and cotton, unless the monsoon gains in momentum in later weeks. To be precise, the share of irrigated area as a percentage of the country’s cropped land is 46.9%. But then in Maharashtra, a major cotton and sugarcane growing state, only 18.7% of farmland has the benefit of irrigation and in Karnataka 34.3%. The skewed distribution of irrigation facilities comes to light with 76.7% cropped area in Uttar Pradesh being irrigation covered and 67.4% in Bihar. But then rivers, canals and reservoirs must get filled by

monsoon rains.

India’s crucial southwest monsoon starts in June and ends in September. The four states mentioned earlier that stand to suffer the most from deficit monsoon accounts for 34% of the country’s grain production in a normal season while jowar, soybean, tur and maize constitute 26% of total grain and oilseed production.

The monsoon’s erratic and poor progress this year clouding farm output prospects comes on the back of 5.5% setback in foodgrain production during 2014/15 to 251.12mt from the previous year’s record 265.04mt. A monsoon deficit of 12% and unseasonal rains and hailstorms causing large-scale damage to standing wheat and other crops in northern Indian states were the reasons for last season’s farm production fall. From rice to wheat to coarse cereals to pulses to oilseeds almost every crop took a hit last year.

The biggest summer crop that southwest monsoon supports is rice, which is the staple food for millions of Indians. As it would happen, the two major rice growing states West Bengal and Orissa have fallen victims to floods and drought, respectively. A survey by the *Financial Express* says while “widespread damage” has been caused by heavy rains and floods in five of 20 districts of West Bengal, including rice bowl Burdwan, Orissa where six of 30 districts have experienced 40% monsoon deficit is facing “a drought like situation.” The country’s foreign trade relating to food items will see radical changes in case farm output suffers a major setback. Like imports of edible oils and pulses will rise and the government will be careful in sanctioning exports of rice and wheat but not basmati rice. What, however, defies logic is the government imposing a 10% import duty on wheat when there is a question mark on domestic production of the cereal. The duty has upset flour mills which traditionally import high quality wheat.

New Delhi is not rushing to make a crop forecast for 2015/16 awaiting outcome of the winter crop season (November to March) when wheat and the second rice crop are grown. But taking note of a “drier than average monsoon although rainfall was not as low as feared at the start of the season,” global credit assessor Moody’s Investors Services has cut its India growth forecast for 2015/16 by half a percentage point to 7%. Domestic rating agency CRISIL, however, says

India's GDP growth this financial year will be 7.4% with the farm sector growing 1.5% on a weak base of last fiscal when foodgrain production slipped 5.5%. CRISIL says "any positive surprise on rainfall over the next 45 days can create some upside to our growth outlook." A benign surprise is, however, highly unlikely since India Meteorological Department thinks the behaviour of rains in the second half will be worse than in the first half.

CRISIL chief economist Dharmakirti Joshi says, "India has suffered weather related turbulences for years. What is worrying is that with rising frequency of such events, the impact is getting increasingly amplified because holistic efforts to reduce structural vulnerabilities are lacking. We believe investing in Indian agriculture's future has become economically and politically critical." The agency says like last year, New Delhi may be able to limit food inflation this time too. But doing that year after year will be an impossible task. The country's farm sector must be made resilient through adequate investment and injection of



appropriate technologies. For an estimated 833m people out of the country's total population of over 1.2bn depend on agriculture for their livelihood. The sector has nearly 14% share of India's GDP.

## After boom of last decade, Brazil soya planting set to be less than last year

Was the period during which the output of soya, maize and other grains in Brazil grew by more than 2% year on year, doubling in a decade, prove to be a one off, and will output stagnate from now on? asks Patrick Knight.

The past decade has been one of extraordinary success for the production and export of Brazil's two principal grains, soya and maize. The amount of soya beans produced has increased from 54mt (million tonnes) in 2006 to almost 100mt this year, while the output of maize has risen from 42mt to almost 85mt in the same time. The amount of both types of grain used in Brazil itself has risen much more modestly, so most of the extra being produced can be exported.

But after a period during which grains prices rose steadily in response to surging demand, which encouraged farmers in Brazil to expand plantings in parts of the country further from ports than those in the south, prices have fallen sharply in the past three years. They seem unlikely to rise again any time soon, while costs, notably of transport, but also fertilizer, have increased sharply. Some overstretched farmers in the centre west are already facing financial difficulties, and some are having to reduce plantings.

Any increase in the amount of grains used in Brazil itself is explained mainly by a steady rise in the production of poultry meat, of which Brazil is now the world's leading exporter. The steady increase in the amount of soya oil blended with mineral diesel fuel, used mainly to power Brazil's huge fleet of trucks, is also of growing importance. Many of these trucks are used to carry grains and oilseeds long distances from fields and processing plants to the ports or railheads, as well as to a new generation of river terminals now being built.

One of the main motors for the increase, at least for soya, has been the steady increase in demand from China. China once prided itself on being self-sufficient in food, but it is now unable to produce enough to cope with the fast-growing demand for

meat and dairy produce, and the grains needed to produce them.

Large quantities of maize have only begun to be exported from Brazil in the past five years. Before then, Brazil frequently imported substantial quantities of this grain from neighbours, or from further afield. Brazilian maize is now exported to numerous countries in the Middle East, notably Iran, as well as to several in Asia, notably Korea. For the time being at least, none goes to China, but this may well change.

The area planted to soya as a main, 'summer' crop in the states of the centre west, notably in Mato Grosso, has grown fast in recent years. This has allowed more maize to be planted in the area as a 'winter' crop, sown immediately after 'summer' soya has been harvested. Whereas a decade ago, two-thirds of Brazil's maize crop was grown in the summer, most of that in the south and south east, now more than half the total maize crop is grown in the centre west region in the 'winter', which is relatively mild there.

Even now, less than half the total area planted to soya in the summer in the centre west, is sown with maize in the winter. So in theory at least, much more maize could be grown and exported from Brazil. It probably will be if the demand exists, and costs can be held down.

Although Brazil is widely seen as one of the few countries with the potential to produce a large proportion of the huge amounts of additional grains and oilseeds which will be needed in the next few years, as the world population increases from the current seven billion or so, to close to ten billion by the mid century, this may not in fact occur, for several reasons.

Much of the huge increase in the area planted first to soya, subsequently to maize in the centre west, has been explained by changes to the way beef cattle have been raised in the region. Most of the substantial amount of extra beef produced in Brazil and exported to a growing range of countries, as beef becomes popular in many places where the red meat was previously



almost unknown, has also come from herds in the centre west region. Herds have migrated from the south and centre west, making way for more profitable grains.

Until very recently, animals have grazed on newly cleared areas of native forest on the fringes of the Amazon rainforest, where few crops were grown. After a few years of this rather haphazard method of grazing, however, soils become exhausted. When this happens, most ranchers have until now preferred to move their stock to a newly cleared area of forest. Moving the cattle on to new land, has been a much lower-cost option than taking steps to increase productivity on the worn-out pastures. Much of this 'degraded' land has been bought cheaply by farmers wanting to plant soya in the past few years. If enough fertilizer is applied, 'degraded' land produces good soya crops year after year. But with the price of cattle soaring and with restrictions on clearing the native forest increasing, many ranchers have begun improving the land themselves, and holding onto their stock. So the amount of degraded land available for planting crops has fallen.

It is important to remember that during the last ten years 'boom' in the amount of soya grown in Brazil, when the crop has virtually doubled in size, the world price of soya beans rose steadily as well. Soaring demand from China, caused mainly by the fact that tens of millions of people who used to live and work in the countryside, where they ate little and rather badly, has moved to some of the thousands of fast-growing cities each year, was the main reason. With more money to spend, urban dwellers tend to eat more and better food, notably meats and dairy produce, than those living in the country. Partly as a result of the slowing of this migration, partly because the rate of economic growth has slowed in the past couple of years, as well as because of severe financial pressures, the authorities in China have taken action aimed at slowing the record growth rate. At the same time as growth was slowing in China, growth in many countries in the developed world, notably those in Europe, but also in Japan and elsewhere, have also slowed, and with it demand for grains and meat, as well as dairy produce.

Because most farms in the centre west of Brazil are up to 2,000km from the nearest port, transport costs are far greater than in most other countries with which Brazil has to compete — notably Argentina and the United States, but also in some grain producing countries in Eastern Europe. This year, although a record 50mt of soya beans, as well as 15mt of soya meal, will be exported from Brazil, lower prices mean the soya complex will earn \$7.5 billion dollars less from its exports than it did in 2014, a fall of 25% or so. While prices have been falling, costs, particularly of transport but also of fertilizer, most of it imported, have increased, again by up to 25%. This has caused many farmers to start pressing the government to make more low cost, or subsidized credit available to them. With prices and demand rising for a decade, many farmers gave priority to increasing plantings, often by renting more land and buying the machines needed to plant and harvest the crops, rather than paying their debts. Many farmers are now coming under pressure from banks and other creditors and some have started handing back some of their land. After a decade when the area planted to soya increase by more than 2% each year, less will be planted this year than last.

The situation would have been far worse for farmers in the centre west and north east, than it has been, had not the Brazilian currency fallen by up to 30% against the \$US dollar, in which the world prices of soya and maize are set, in the past year. The result of the currency fall has been that although

export earnings in US dollars have fallen sharply, earnings in local currency, which form the majority of farm costs, have remained steady or increased. So farmers have been protected so far.

Many of the reasons for the fall in the real are not just temporary, but structural and will persist for several years. Despite the fact that some measures have been taken to slow the fall in the value of the real, the weak real is not bad news for everybody. The weak currency means Brazilian-manufactured goods have become more competitive in export markets, which the government welcomes.

Higher earnings from the export of manufactured goods, will partly compensate for the fact that the price of most commodities, which form a large proportion of Brazil's export earnings, have fallen sharply in the past few years.

Soya and maize as well, are grown in two distinct areas in Brazil, and different criteria apply to each of them. Until 30 years ago, the majority of both crops was grown either in the three southern states, where the first varieties of soya available at that time, were planted in Brazil, or in the adjacent the south east. With few exceptions, only one crop could be grown each year in such parts of the country, where winters are quite severe.

Soya's first advance, which occurred during the late 1960s and accelerated during the 1970s, involved a move north into the states of central Brazil. Most land there is of the 'savannah' type. Soils are sandy and drain fast, and most vegetation is scrubby, as soils are poor. Varieties of soya adapted to the climate in the centre of Brazil, had been developed by agronomists, and large amounts of fertilizer are used, which has allowed soya to move north. Rainfall is concentrated in just five months in the savannah region, while rains are better distributed in both the south, and the centre west and north of Brazil, where the latest expansions in planting have occurred, and new varieties of seed suitable for the tropics, have been developed.

Huge areas of mainly scrubby forest were cleared in the savannah, an area where eight of Brazil's 12 major river systems have their sources, and planted to growing soya.

Little attention was paid at that time to the impact clearing the forest cover might have on the rainfall pattern, or of the amount of water retained in the sandy soils.

The past three years in the south east of Brazil have seen water levels in the reservoirs used both to generate electricity and to store drinking water, fall to critical levels. Water tables have been falling, along with rainfall in the savannah itself and in neighbouring south east. This is causing great concern, as scientists worry that the change might be permanent.

Concern is growing that the change in the weather pattern may have been caused by the fact that huge areas are now exposed directly to rain and sun, rather than being shielded by their forest cover. Scientists are urging for measures to be taken to replant savannah land with trees, at the expense of crops, in the savannah region. Much of the centre west is also savannah, and the same concerns apply there.

Consumers in many of the countries where the soya is used as animal feed have also become concerned about the threat of climate change, so to counter this, the soya crushers adopted measures aimed at ensuring that no new areas of native forest may be cut by the farmers who supply them. This has resulted in the rate of forest clearance falling sharply in the Amazon region in recent years. But demand for timber remains unabated, both for use in Brazil itself and for export and the measures aimed a limiting forest clearances are often opposed by farmers and ranchers, as well as loggers.



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## Fratelli Neri orders first Damen ASD 3212 tug with Render Recovery winch in Mediterranean

One of the largest Italian tug owners, Fratelli Neri S.p.A, ordered its first Damen tug, an ASD 3212, on 21 July 2015. The vessel will be the first ASD tug in the Mediterranean region with a Damen Render Recovery Escort winch. The family-owned, Livorno-based harbour towage company has been in operation for over 100 years. Besides this new tug, the company has ordered two additional second-hand Stan tugs 2608 from Damen Trading.

“Damen’s well-known high quality construction and reliability, as well as fast delivery times, were the main reasons behind our decision to place this order. We are proud to add this Damen ASD 3212 tug to our fleet and quite confident that our masters will enjoy using it. The tug will be used for port towage in the Mediterranean, although its versatility and performance do not preclude our using it elsewhere,” comments Fratelli Neri Chartering Manager, Corrado Neri.

“Our group recently also took delivery of two second-hand Stan tugs 2608. Their technical characteristics match perfectly with the requirements of a tender awarded to us by a major foreign oil company. The proven concept design and long lasting quality of these tugs also drove our decision to purchase them.”

“We are extremely delighted that this prestigious Italian, family-owned company has purchased its first new Damen tug. The tug will be delivered by December 2015. It was on stock and customized with the Italian flag including fire-fighting — water spray — notation as well as oil recovery notation,” comments Damen Sales Manager North, West and South Europe, Andrea Trevisan.

This innovative tug design includes a completely revised hull form and a higher bow, resulting in better speed and a dry foredeck. The first ship handling tug winch in the world to be fully classified, its hydraulically powered, double drum winch has an impressive maximum brake holding load of 200 tonnes. This powerful tug with bollard pull of over 80 tonnes, and excellent seakeeping and manoeuvrability, can cope with higher wave heights when assisting large tankers and container vessels in open and challenging waters.

The Damen ASD Tug 3212 has undergone rigorous testing over the past few years, both at Damen’s own Research & Development Department and the Maritime Research Institute Netherlands (MARIN).

Staying connected to the assisted ship is vital for tug operation and very high peak loads can lead to the towline breaking. “The Render Recovery winch has proven it is far more reliable and faster in demanding sea escort operations in recovering a line than a normal winch is,” adds Trevisan.

Besides these three tugs, Fratelli Neri also purchased a Damen Stan Tender 1905, (LNG Express) in 2010. Built from a stock hull, it was delivered just six months after the contract was signed. The ‘LNG Express’ is used as a crew boat at the floating LNG terminal near Livorno, Italy.

### DAMEN SHIPYARDS GROUP

Damen Shipyards Group operates 32 shipbuilding and repair yards, employing 9,000 people worldwide. Damen has delivered more than 5,000 vessels in more than 100 countries and delivers some 160 vessels annually to customers worldwide. Based on its unique, standardized ship-design concept Damen is able to guarantee consistent quality.

Damen’s focus on standardization, modular construction and keeping vessels in stock leads to short delivery times, low ‘total cost of ownership’, high resale values and reliable performance. Furthermore, Damen vessels are based on thorough R&D and proven technology.

Damen offers a wide range of products, including tugs, workboats, naval and patrol vessels, high speed craft, cargo vessels, dredgers, vessels for the offshore industry, ferries, pontoons and superyachts.

For nearly all vessel types Damen offers a broad range of services, including maintenance, spare parts delivery, training and the transfer of (shipbuilding) know-how. Damen also offers a variety of marine components, such as nozzles, rudders, anchors, anchor chains and steel works.

In addition to ship design and shipbuilding, Damen Shiprepair & Conversion has a worldwide network of 15 repair and conversion yards with dry docks ranging up to 420 x 80 metres. Conversion projects range from adapting vessels to today’s requirements and regulations to the complete conversion of large offshore structures. DSC completes around 1,500 repair and maintenance jobs annually.

### NERI

Neri provides marine solutions in the field of harbour towage services and related maritime services. Towage services to offshore and onshore terminals, salvage and wreck removal, environmental protection, chartering, barge rental and transport, coastal and river towage, heavy lifting and marine support to a variety of civil and offshore projects, storage and handling facilities of chemical products.

The family Neri traces its presence in Livorno back to the late 1600s, when a family of sailors from Sestri Levante moved into the village of Livorno. Costante Neri (1863-1935), the father of Tito and Alfredo, was actively engaged as a leader of a ‘caravan’ of stevedores with the duty of loading and unloading, by means of small boats, to ships that arrived in the harbour.



*Artist's impression of the new tug.*

## Pioneer Marine appoints V.Ships India as managers

V.Ships, the ship management arm of global maritime services provider V.Group, has recently completed the transfer of the rapidly growing Pioneer fleet of geared dry bulk carriers into its management portfolio.

Pioneer Marine Inc, a fleet owner of some one million deadweight of tonnage, currently operates 13 operational Handysize and Handymax dry bulk ships on the water with a further 12 ships currently under construction in China.

Initially contracted in August 2014 to manage three of Pioneer's vessels, V.Ships has since conducted a seamless transfer of the remaining operational fleet (on water), with another three new Green Dolphin (RT Flex) vessels scheduled for completion and integration later in 2015.

Headquartered in Singapore, Pioneer trades on the Norwegian OTC under the name PNRM and is proud of its ambitious growth strategy. Pankaj Khanna, CEO Pioneer Marine Inc said: "from early beginnings less than a year ago, Pioneer and V.Ships India have rapidly developed a trusted relationship which has seen V.Ships assume the full third party management of our entire fleet of vessels. This significant development has given V.Ships the opportunity to handle day to day management of the fleet, resulting in reduced costs and improved operational performance for Pioneer."

Since opening in 2007, V.Ships India has seen impressive

growth of the Indian and foreign flag fleets under its management. With over 100 employees, the Chennai operation is being developed as a Centre of Excellence within V.Group.

Capt. Sachit Sagoonja, Managing Director of V.Ships India said: "We are proud to have delivered the results to Pioneer that has seen them transfer their full fleet into V.Ships' management and we thank them for giving us this opportunity to demonstrate our capability. We are committed to providing them with the highest quality services with absolute regard to safety and marine environment."

V.Group is a leading provider of outsourced maritime services to the commercial shipping and cruise industries and an increasingly important player in the energy sector.

The company delivers a wide range of marine services including technical management and support through its market-leading third party ship manager, V.Ships; seafarer recruitment, management and training; procurement, and ship supply chain management.

V.Group employs 2,500 staff around its global office network in 60 locations and manages the recruitment and placement of some 38,000 seafarers. It delivers ship and crew management services to a diverse fleet of over 800 vessels, including bulk carriers.



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## PSM wins UK navy supply contract

In recognition of its unique ability to 'reverse engineer' existing installations, the UK's Royal Navy has named PSM as a primary supplier of tank level instrumentation to their surface warship and support vessel fleet.

PSM has worked with the Navy for decades and in that time has delivered some inspired solutions based around the ICT 1000 level and Tankstar 260 pressure and level transmitters, to replace existing products obsoleted by other suppliers.

By developing these bespoke products, PSM is saving the Navy additional expense that would normally be incurred by modifying tank and cable installations to accept another design of transmitter. Extended and lengthy project lead times that can add cost and complexity to refit projects have also been avoided.

The obsoleting of hydrostatic level and pressure transmitters is becoming a common issue faced by many end users, who are being left with insufficient customer service and delivery, or without the ability to directly replace or repair failed products. PSM is increasingly helping customers to solve this problem by offering new transmitters that are mechanically and electrically equivalent to the failed OEM items.

Both the ICT 1000 and Tankstar 260 are available with a full range of process connections and fixing, based on common competitors' part numbers, to ensure the appropriate options are specified. Custom constructed connections and mounting fixtures are also available.

"We're delighted to be recognized by the Royal Navy as a key supplier and solutions provider," said Mark Jones, PSM Sales Director. "They are just one customer who have been affected by other suppliers' obsolete products and we are only too happy to assist. We look forward to working with them and all others who we can help with a rapid and economical solution for maintenance and repair projects."

## Thome Ship Management signs agreement with WSS

Singapore-based Thome has signed a Safety Service agreement with Wilhelmsen Ships Service (WSS).

Ryan Dalgado, Procurement & Supply Chain Manager from Thome said: "Partnering with WSS on our safety service management gives us the assurance that our safety equipment is managed to the same high standard, wherever our vessels are operating. Working with WSS, we also benefit from their geographical spread and in-depth knowledge of local port procedures to keep port stays short."

Harald Lundestad, General Manager for WSS in Singapore said: "Companies such as Thome have to balance the logistical demands of managing a large and diverse fleet trading worldwide with the challenge of keeping vessels compliant. Our Safety Service Agreement allows us to monitor due dates and pro-actively plan service visits so that we can help customers improve efficiency in safety management."

WSS safety service technicians carry out services on a wide range of safety, firefighting and rescue equipment such as CO2 high-pressure systems, portable fire extinguishers, hydrants and fire hoses, inflatable life jackets, smoke sampling systems and portable gas detectors.

All WSS service stations operate in accordance with IACS, UR, Z17 approvals and governance. WSS is the only service network with an ISO 9001 approval. It is also approved by DNV GL, Korean Register, Bureau Veritas, ABS, Lloyds Register, Russian Maritime Register of Shipping and RINA.

### ABOUT THOME

Thome Group of Companies is a dynamic provider of integrated ship management services to the international shipping and offshore industries. Based in Singapore, and celebrating more than 50 years of service, the Thome Group of Companies represents a unique combination of the best elements of Scandinavian shipping tradition with the modern drive of Asian business enterprise.



*Harald Lundestad, General Manager for WSS in Singapore.*



ECAAP propeller by MMG

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# Bulk carrier safety



## Liquefaction strikes again

**T**he spectre of seafarers losing their lives due to cargo liquefaction continues to blight the bulk carrier industry, writes Mike King.

In January this year the *Bulk Jupiter* sank along with 18 crew off the coast of Vietnam. One crew member was rescued, two bodies were recovered and a further 16 crew, all from the Philippines, were presumed dead.

The 56,000dwt, 2006-built vessel had loaded bauxite in Malaysia during the monsoon season and insurers were quick to issue a flurry of warnings about the dangers of liquefaction. Those worries were further heightened when the sole survivor, Rojas Angelito Capindo, the ship's chef, reported that the ship sank very quickly for no reason discernible to the crew early in the morning. But it took until July before the cause of the loss was confirmed by the Flag State of the Gearbulk-owned vessel when Bahamas Maritime Authority (BMA) produced its report into the loss. As has been the case far too frequently in recent years, cargo liquefaction was found to be the only feasible reason to explain why the vessel and its crew were lost.

Of course, the bulk carrier industry has been here before. Indeed, the trade in minerals from South East Asia on voyages into China has been the single-biggest cause of seafarer deaths on international trades for the last ten years in the global shipping industry, accounting for far more lives than piracy (see table) despite the tonnage carried over the period being miniscule in terms of volumes shipped annually on bulk carriers.

While the IMO's glacial reform process has improved matters, not least by adding nickel to the group of cargoes — Group A under the IMSBC Code — that can liquefy, BMA's report concluded that far more needs to be done.

Liquefaction is a chemical process that can turn some minerals from solid state matter into a liquid sludge which can quickly destabilize a vessel due to cargo shift which can also damage the ship's structure, putting crew in huge danger. DNV GL describes liquefaction as "a phenomenon in which a soil-like material is abruptly transformed from a solid dry state to an almost fluid state."

DNV GL adds: "There are some distinct and disturbing features of accidents caused by cargo liquefaction. Firstly, the



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## LIQUEFACTION ACCIDENTS

Vessel	DWT	Built	Lives lost	When	Cargo type	Cargo origin
Asian Forest	14k	2007	0	17.07.2009	Iron ore fines	India
Black Rose	39k	1977	1	09.09.2009	Iron ore fines	India
Jian Fu Star	45k	1983	13	27.10.2010	Nickel ore	Indonesia
Nasco Diamond	57k	2009	21	10.11.2010	Nickel ore	Indonesia
Hong Wei	50k	2001	10	03.12.2010	Nickel ore	Indonesia
Vinalines Queen	56k	2005	22	25.12.2011	Nickel ore	Philippines
Sun Spirits	11k	2007	0	22.01.2012	Iron ore fines	Philippines
Harita Bauxite	50k	1983	15	16.02.2013	Nickel ore	Indonesia
Trans Summer	57k	2012	0	14.08.2013	Nickel ore	Philippines

Source: DNV GL

accidents happen very fast. The time that elapses between liquefaction being detected, if it is detected at all, and the vessel capsizing is in some cases only a few minutes. This leaves very little time for remedial measures. It also leaves very little time for the safe evacuation of the ship, and such accidents are often associated with tragic losses of crew members.”

DNV GL’s description of the “phenomenon” of liquefaction earlier this year was produced before the cause of the *Bulk Jupiter* loss was known, but the classification society anticipated the findings of BMA with uncanny prescience.

The *Bulk Jupiter* sank on 2 January. It had previously loaded 46,400 tonnes of bauxite at the Malaysian port of Kuantan and had then sailed for the port of Qingdao in China. The vessel was relatively young — less than ten years old — and it had been strengthened for heavy cargoes. It entered the Bahamas register in 2011 and had dry-docked in Shanghai in May 2014, completing its Intermediate Survey in July of the same year. A Certificate of Compliance to the Maritime Solid Bulk Cargoes (IMSBC) Code was issued in April 2014. In short, the vessel was well-managed, operated responsibly by a reputable owner — Gearbulk — and was registered with a respected Flag State.

So there were no obvious red flags associated with the vessel prior to its arrival in Malaysia. Instead, BMA found that the source of the loss was the state of the vessel’s bauxite cargo when it was loaded.

The *Bulk Jupiter* was fixed under charter to carry a cargo of bauxite and arrived alongside the berth on 16 December 2014, but loading was not completed until 30 December due to frequent and prolonged periods of exceptionally heavy rain. While the rain was falling, hatch covers were closed but the cargo itself was not covered. Moreover, Kuantan port received the bauxite from a nearby open cast mine on open-topped trucks.

“The loads were dumped onto the quayside and loaded into the holds by grab using the ship’s own cranes,” said the report. “Comments provided by one deck officer who left the ship before departure indicated that the trucks had no covers when transporting cargo to the port, stockpiles were left uncovered as was cargo on the quayside pending loading onboard — including during periods when loading was interrupted by rainfall.”

BMA said that although the ship had been provided with a ‘Form For Cargo Information for Solid Bulk Cargoes’ issued by the shipper stating that the cargo comprised particle size ‘2.5–500mm 70–90%’ and moisture content at shipment of ‘10%’, it was observed that “these figures were identical to the Individual Schedule for bauxite in the International Maritime Solid Bulk Cargoes (IMSBC) Code”.

The BMA report added: “The form was signed as issued on 11 December 2014. It is difficult to conclude that the form

represents anything other than indicative information rather than specific characteristics of the cargo.”

During the course of the registry’s investigation, test results were taken from samples of the commodity loaded onto the *Bulk Jupiter* during the loading period of 17–30 December. The test report indicated that the average moisture content from ten lots was 21.3%. Results of moisture testing were also obtained from hold samples taken from another ship which was still loading at the time of the loss of the *Bulk Jupiter*. “Of 45 results the highest as-tested moisture content was 18.46% and the lowest 12.99%,” said BMA.

“A further ship which had departed the port on the 1 January with a similar cargo of bauxite became aware of the sinking of the *Bulk Jupiter* on the evening of 3 January. Weather conditions did not permit examination of hold contents until the morning of 5 January when cargo in all holds was found slumped, with surface pools of free water, and described as ‘moving to port and starboard in a jelly-like fashion’. This ship was diverted to the closest port of refuge and all cargo was discharged.”

Taking the evidence from the three ships, BMA concluded that the cargoes were loaded in a condition which was “not in accordance with the Individual Schedule for bauxite in respect of moisture content.”

The report added: “The ship was well managed by a company with an excellent and proactive safety record, and the structural condition of the ship was found to be satisfactory at all Flag, Port State, Class and Company surveys and inspections. In the absence of any evidence to suggest catastrophic structural failure and in the light of the facts that there was no collision or grounding or extreme weather conditions, the conclusions drawn by the investigation point to loss of stability through cargo liquefaction.”

Unlike most of the other reports into bulk carrier losses due to liquefaction — many of which were not made public without a great deal of pressure and which in some cases took far too long to be released even to victims’ families, as reported previously by DCI – BMA not only released its report promptly, it also admirably called for reforms to prevent further losses.

“Seafarers have a right to expect that the cargoes loaded onto their ships are properly declared,” said the report. “In this case it cannot be argued that the declaration received on board accurately reflected the cargo being loaded. While seafarers should be aware of potential safety issues this paper does not argue that anyone holding a cargo watch should be expected to be able to assess the conformity of a cargo by sight. The suitability and conformity of a cargo is the clear responsibility of the shipper and not the ship.”

According to BMA, although the Individual Schedule for



*Nickel ore, which is highly susceptible to liquefaction in the hold.*

bauxite specifies a range of moisture content, the list of information to be provided to a Master does not include the requirement for the dimensional characteristics of the cargo. “In fact, and despite the fact that the schedule does specify a range with an upper limit of 10%, even moisture content and TML only needs to be communicated ‘in the case of a concentrate or other cargo which may liquefy’.

“Large amounts of bauxite have been safely transported around the world for many years although some concern was raised by P&I Clubs regarding the potential of liquefaction of bauxite cargoes in 2012. The [*Bulk Jupiter* loss and subsequent casualties] may have arisen through a combination of record rainfall and a higher ratio of powder/lumps in the bauxite cargo than the schedule specifies, but it is clear that the consequences justify the importance of the need for improved control over the loading of bauxite.”

“Bauxite is a Group C cargo and the schedule has no advice on special precautions to be taken. Of particular relevance is the fact that no weather precautions are specified. This is a clear deficiency in the schedule.”

BMA, which will present its findings to the IMO’s Sub-Committee on Carriage of Cargoes and Containers’ (CCC) second session over 14–18 September, would like the IMO to consider reclassifying bauxite as a Group A cargo which can liquefy. Alternately, the authority will request that the sub-Committee treat bauxite “as a cargo for which the Master should be automatically provided with the test certificates under 4.3.1 of the Code” and, where such test certificates are not supplied, are deficient in any respect “or have any other cause for concern” bauxite should then be treated as Group A cargo.

BMA also called for test certificates issued for bauxite to clearly set out the actual proportions of lumps and powder of the cargo to be loaded as determined through testing and for additional weather precautions to be specified.

BMA’s call for regulatory reform is no lone voice. DCI has

long campaigned for tighter regulation and oversight of the world’s deadliest shipping trades — the carriage of minerals that can liquefy from South East Asia to China when loading occurs during the monsoon season. Dimitris Dedepsidis, Team Leader for Plan Approval and Ship Type Expert for bulk carriers at DNV GL in Greece, also agreed that cargo liquefaction “has not yet been properly accounted for by international regulations,” and was of major concern for shipowners.

“Some of the terminals that handle mineral ores such as nickel ore and iron ore fines, are located in tropical areas,” he added. “Especially during the rainy season, the cargo’s moisture level can therefore be significant, and may be close to or even exceed the transportable moisture limit of the specific cargo. If such cargo is loaded, it significantly increases the risk of cargo liquefaction during the ship voyage, which may eventually lead to a serious stability problem or affecting the structural integrity of the ship.”

DNV GL found that an ore carrier’s tank boundaries were not always assessed for the possibility of cargo liquefaction. “If it does occur, the pressure on the non-horizontal cargo hold boundaries can increase by a factor of two or even three,” said Sönke Pohl, Key Account Manager and Ship Type Expert for bulk carriers at DNV GL in Germany.

To help customers tackle the issue, DNV GL has worked with several shipping companies to prepare a guideline for the design and operation of vessels with bulk cargoes that may liquefy. The intention of this guideline is to raise the awareness of the risks of cargo liquefaction on ships, and to describe what mitigating actions may be taken to reduce such risks.

Hopefully, when the IMO’s CCC 2 meets, it will be equally proactive as DNV GL and take urgent steps to amend the Schedule for bauxite by making recommendations to the IMO’s Maritime Safety Committee so it can then amend the IMSBC Code. If not, yet more lives could be lost on South East Asia’s deadly mineral trades.



# Keeping up with the Canadians



## Green terminals stay ahead of legislation and keep pace with the market

The tide of environmental protection is changing the landscape of maritime regulation, with the industry being slowly forced to clean up its act, writes Warwick Norman, Chief Executive Officer, RightShip. The IMO introduced the Energy Efficiency Design Index (EEDI) to measure the carbon dioxide (CO<sub>2</sub>) emissions for all new builds from 2013; sulphur caps have been introduced in Emission Control Areas (ECAs) with a proposal for a worldwide cap by 2020; and tier III nitrogen oxide (NO<sub>x</sub>) emission standards will be mandatory on all new builds from 2016.

Transporting over 90% of the world's goods, the ubiquitousness of the maritime industry in customer supply chains means that public pressure is forcing charterers, ship owners, banks, insurers and now port operators to play a role in reducing their emissions footprint.

Many significant industry players have publically announced their use of a variety of emission reduction technologies and measurement tools that keep them abreast of these market forces, but ahead of regulation. Banks such as ABN Amro, HSH Nordbank and KfW IPEX have also recently announced their use of RightShip's Greenhouse Gas (GHG) Emissions Rating to assess risk and return, with inefficient vessels now representing a higher-risk investment.

RightShip's GHG Rating, developed from the EVDI (Existing Vessel Design Index), measures the theoretical CO<sub>2</sub> output of all vessels — not just those built from 2013. This rating assigns each ship with an A–G nomination across a peer group of vessels of a similar size and type, where A represents the most

efficient vessels. Charterers such as Cargill, Huntsman and Mosaic to name a few, collectively representing 26% of global bulk cargo or 1.95 billion tonnes annually, use the GHG Emissions Rating to select the more energy-efficient vessels.

Ports which are working to keep pace with market forces are also finding themselves a step ahead of regulators. With an 'act local, think global' mantra, leading port authorities are cleaning up their own backyard, and in so doing are acting as a vital link in greening the maritime industry supply chain.

### PORT OPERATORS & ENVIRONMENTAL STEWARDSHIP

Western Canada's Port Metro Vancouver and Prince Rupert Port Authority are two ports that have implemented successful incentive programmes that reward energy efficient vessels.

Port Metro Vancouver, Canada's largest and most diversified port, took early steps to recognize the more environmentally sustainable vessels through their EcoAction Program. Launched in 2007, this program promotes emission reduction measures that exceed the current legislative requirements, offering discounted harbour due rates to vessels that have implemented emission reduction measures and other environmental practices.

Supporting a range of measures, Port Metro's EcoAction Program provides rewards on a three-tier basis, with vessels that achieve an 'A' in RightShip's GHG Emissions Rating qualifying for the highest 'gold' discount, or a 47% reduction in harbour dues. Though EcoAction, in 2014 Port Metro discounted over \$1 million in harbour dues to vessels going beyond regulatory requirements to reduce emissions.

Both Port Metro and the Port of Prince Rupert — Canada's second largest west-coast port — work within the Green Marine environmental program with a common group of ports, terminal operators and supply-chain partners throughout North America.

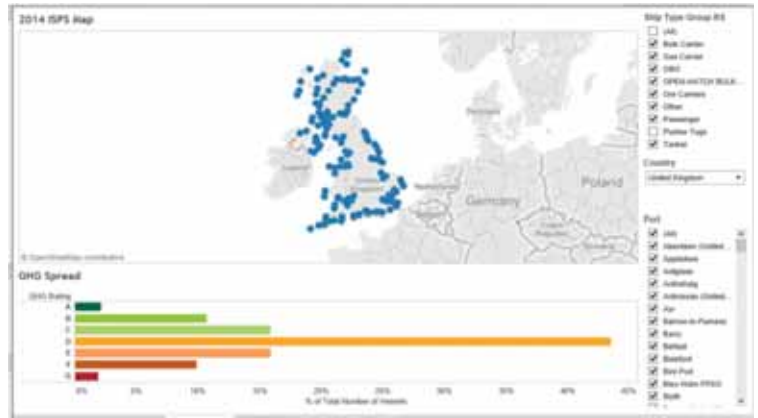
In 2014, 45% of Prince Rupert's vessel calls qualified for discounted harbour dues under their Green Wave vessel incentive scheme, which recognizes and rewards vessels that have a lower environmental footprint. Of these 197 vessel calls, 84% qualified through RightShip's GHG Emissions Rating. The flow-on benefits of the Green Wave Program have been significant to Prince Rupert — so much so that they are extending the programme to reward all RightShip A-rated vessels with automatic qualification for the highest discount.

Although both these programmes recognize vessels that are ahead of legislative requirements, the changing landscape of environmental regulations means they need to keep evolving to maintain this positioning. For example, the recent introduction of mandatory changes to sulphur content (0.01% in emission control areas) means that low sulphur fuel is no longer recognized by these programmes: there is no value in rewarding something that simply meets regulatory compliance.

#### ESTABLISHING ENVIRONMENTAL INCENTIVE PROGRAMMES

An incentive programme allows ports to encourage and reward efficient vessels operating above environmental compliance. There are numerous options for incentive programmes, including RightShip's GHG Emissions Rating and Environmental Score Rating, Green Marine, Green Award, CSI (Clean Shipping Index), ESI (Environmental Shipping Index) and the previously mentioned EEDI — although the latter only applies to ships built from 2013.

Implementing an environmental incentive programme should be preceded by the benchmarking of historical arrivals. Crucial to the planning process, this data can be used to calculate a baseline for displaying trends over time and demonstrating improvements in GHG emissions from ships — both in port and for their entire journey. Benchmarking is also used to establish an estimated cost of the incentive programme, ensuring budgets can be set and managed within management expectations. This is also useful if the port authority is applying for external (e.g.



government) funding.

Utilizing RightShip's GHG Rating, the screenshot map shows the Greenhouse Gas Emissions Rating of all vessels arriving in UK ports in 2014. This information can obviously be tailored by vessel type and by individual port, so clear baselines can be established and improvements demonstrated.

Positioned — quite literally — at the forefront of the effects of global warming and rising sea levels, ports are increasingly aware of the impact of CO<sub>2</sub> emissions. Using a measurement tool such as RightShip's GHG Emissions Rating provides visibility as to their efficiency and enables an evidence-based response to public pressure and customer demands, ensuring they are ahead of the game when regulation catches up with these market forces.

And the best thing of all? As part of their 'giving back to industry' policy, RightShip provides this service free of charge to ports.

#### ABOUT RIGHTSHIP

Leading the way in safety and environmental sustainability, RightShip is the world's leading maritime risk management and environmental assessment organization. RightShip's comprehensive online system is accessed 24/7 through the company's website, using up-to-the-minute data from over 76,000 ships and thousands of maritime companies to deliver instant, reliable marine risk and environmental sustainability assessments.

#### ABOUT THE AUTHOR

Warwick Norman, Chief Executive Officer, RightShip. Norman has been Chief Executive Officer of RightShip since its inception in 2001. Under his stewardship the company has become a global authority on maritime safety and environmental sustainability, helping shippers, terminals and ports, ship owners, managers and maritime finance organizations to minimize their maritime and environmental risk.

A third generation seafarer, Norman sailed from cadet to the rank of Master in ASP Ship Management's tanker fleet. Prior to joining RightShip, he was the Marine Standards Manager at BHP Billiton where he was responsible for ensuring the company adhered to national and international standards for Quality Assurance, International Safety Management and Safety and Environmental Protection as well as salvage operations and insurance issues.

Norman has lectured in tanker safety at Australian maritime colleges, served as a board member of the Seafarers' Workers Compensation and Rehabilitation Board and the Marine Council, and is currently a member of Lloyds Register Asia Advisory Committee and Chairman of AUSMEPA.







# Bedeschi's new marine projects



*Vale II – Ore Sossego, Philippines.*

The coal and iron ore industries are going through tough times, writes Sanjeev Mathur – General Manager Bedeschi East Dubai. At the same time, the shipping market is also experiencing its own difficulties. While some companies are reluctant to invest at this time, others see it as an opportunity to develop and to take the lead once the market improves. Rocktree has demonstrated just that by taking delivery a new transshipper *Apollo*. Before we go into the details of *Apollo*, let us first throw some light onto why transshippers are required in the first place.

Offshore transshipment essentially means transfer of dry bulk cargo like coal or iron ore from large vessels into smaller vessels or vice-versa. Vessel sizes have grown rapidly since the Second World War but port development has not been able to keep pace. Vessel sizes have increased because of economies of scale i.e. the larger the vessel, the lower the per-tonne transportation cost. Port development, unfortunately, has lagged behind, mainly because of a high gestation period and a high development cost. The only way to overcome this bottleneck is offshore transshipment. Many kinds of transshipment devices have been devised and deployed in various areas, mainly for the handling of coal and iron ore.

We will take the example of Indonesia which has witnessed

phenomenal growth in the coal exports in the last decade. This has only been possible with an equally remarkable growth in facilities for loading coal, which has been able to keep pace with the increased demand. While Indonesia lacks the shore-based infrastructure to load large vessels at berth, it has been blessed with a large numbers of rivers which connect the hinterland to the sea front. The bulk of coal exports from Indonesia takes place from the coal mine to the end users via rivers. After the coal is mined, it is then loaded onto barges that then transport it directly to the various loading facilities which are either shore based or offshore.

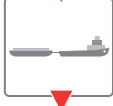
At the last count, more than 150 offshore loading facilities are presently operating in Indonesia. These floating facilities can broadly be classified into three different kinds: floating cranes — which are single or twin cranes mounted on pontoons; floating transfer units — cranes mounted on pontoons working with a combination of cargo handling systems comprising hoppers, conveyors and shiploaders; and floating terminals — large floating devices with floating buffer storage.

Bedeschi has implemented five of the best operating transshippers in Indonesia — *Mara*, *Zeus*, *Princess Chloe*, *Vittoria* and *Bulk Celebes*. While *Mara* is a Panamax vessel converted into

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Toros Terminal, Turkey:  
 example of synergies of Bedeschi, Liebherr and Logmarin,  
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a floating storage and transfer station fitted with four cranes and two shiploaders, the others are pontoons mounted with two cranes each and one shiploader each in combination with an array of hoppers, feeders and conveyor systems.

Another example is Goa in India, where more than 80mt (million tonnes) of iron ore were exported exclusively by offshore transshipment facilities before the ban on iron ore mining came into force. Here, too, the iron ore is mined in the hinterland and is brought to the sea by two rivers in barges, where it is loaded directly into OGV (oceangoing vessels) by the use of various transshipment devices. Three transshippers have been implemented by Bedeschi in Goa: the *Shatixa*, *Royal Sesa* and *Chowpatlal*.

With the commissioning of *FTS Ore Fabrica* and *Ore Sossego* the world has witnessed a totally new phenomenon. These transshippers are the largest in the world and have revolutionized the way iron ore transportation takes place in the world. To take advantage of the economy of scale, Vale has ordered vessels in excess of 400,000 tonnes dead weight capacity, known as Valemax, to transport iron ore from Brazil to the Far East. Since these huge vessels cannot be accommodated in most of the ports, there was a need for a transshipment device, which could transfer the iron ore from the Valemax vessels into more manageable Capesize



*Puerto Brisa  
shiploader, Colombia.*

vessels. For this, the *Ore Fabrica* and *Ore Sossego* have been implemented. The newest transshipper is *Apollo*, which has been delivered to Rocktree and which will commence coal transshipment operations in Indonesia. *Apollo* has a daily load rate of 40,000 tonnes from barges to ocean going vessels. It also has the latest technology for the blending of various grades of coal into a homogeneous blend and also automatic sampling of coal. The hoppers, feeders belts, conveyors and the shiploader are supplied by Bedeschi. The cranes have been supplied by Liebherr and the engineering has been carried out by Logmarin.

In addition to offshore transshipment projects Bedeschi has developed various onshore projects too.

#### **PUERTO BRISA PROJECT, COLUMBIA**

Bedeschi has recently completed the supply of a shiploader with a loading capacity of 6,000tph (tonnes per hour), including more than 3km of conveyers, for Puerto Brisa, an important harbour on the Caribbean Coast of Columbia. This port is located in a really strategic site as it is ideally positioned to serve Central and South America, the East Coast of the USA, the European Union, and of course the Panama Canal. The multipurpose terminal of Brisa will primarily handle coal but will also be able to handle other dry bulk cargo as well, and vessels up to 180,000dwt can be loaded at this port.

Bedeschi's scope of work was the supply of a customized shiploader suiting the client's requirements, and of the related overland conveyor. Engineering, manufacturing and assembly has been carried out completely by Bedeschi. The travelling, slewing and luffing shiploader is equipped with a curved chute to enable complete distribution of cargo inside the holds of vessels to be loaded, so as to avoid broken space; average capacity is 5,000tph coal (designed to handle up to 7,000tph). The shiploader is fed by a 1,800mm belt conveyor which is connected to is 3,500m land conveyor.

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## Landmark vessel call for Greenore Port



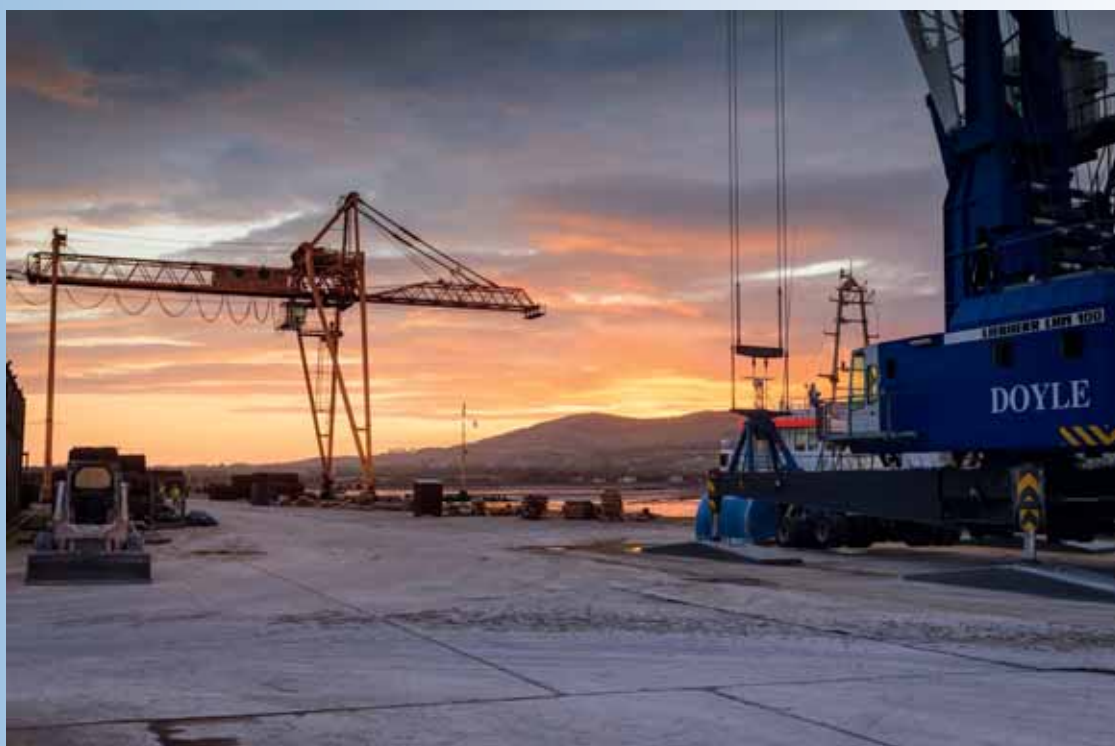
Following the completion of an extensive port dredging project, the arrival of the largest steel ship to ever call to Greenore Port in Ireland represents a new landmark for the port. The cargo vessel *Smart Tina* arrived in early August from China as part of its maiden voyage. The *Smart Tina* has a dead weight tonnage of 38,900dwt and measures 180 metres in length. Greenore Port completed an extensive port dredging project in May. Prior to the dredging works being carried out, the port would have been unable to handle a vessel of this size.

One of the most challenging aspects of the project was the deepening of the berthing area which is located in a section of the harbour with a rock bottom and strong tidal currents. "Dredging commenced in February and by mid-May we have removed over 7,000 tonnes of rock from the harbour bed," said Niall McCarthy, General Manager of the port.

Greenore Port was purchased by the Doyle Shipping Group in late 2014 and the port deepening project is part of the group's strategic plan to develop facilities at the port. McCarthy commented that the project was an investment in the future of the port. "There is a growing trend in the industry for larger, more efficient vessels which provide customers with economies of scale, it is important that Greenore Port can facilitate such vessels, so the arrival of a vessel the size of the *Smart Tina* is indeed a landmark," he said.

Greenore Port's previous largest steel ship was the *Ourania*, which had a deadweight tonnage of 27,797dwt.

A privately owned Irish company, the Doyle Shipping Group's portfolio includes operations in Dublin, Belfast, Cork and Foynes ports. The company has been operating since 1886 when it was founded by D F Doyle.



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The background image shows a long train of red hopper cars on a railway track, with a large green conveyor system overhead. The scene is set in an industrial environment, likely a coal mine or processing plant, under a blue sky with scattered white clouds. The train extends into the distance, and a large pile of dark material, possibly coal, is visible on the right side of the track.

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## ABP invests £2.2m in Garston bulk terminal

Associated British Ports (ABP) is investing £2.2m in an environmentally-friendly new bulk terminal at the Port of Garston, providing the port with future growth opportunities.

With the port's current stores at capacity, the construction of the new facility will provide an additional 3,950m<sup>2</sup> worth of storage for bulk commodities such as wheat, rice, fertilizer and organic feed.

"Our investment at Garston is yet another example of ABP's ongoing strategy to add state-of-the-art bulk stores across our ports in order to better serve our customers," said Andrew Harston, short sea ports director, ABP. "ABP has built new stores in Ayr, Ipswich and now Garston and Teignmouth."

"We are investing £6m to provide additional facilities to our short sea customers by the end of 2015, and it re-affirms our commitment to keep Britain trading," he added.

Designed to minimize its impact on the environment, the terminal also has solar panels to provide a clean energy generating capacity of 200kw. The solar array is linked to the network powering the port estate, providing sustainable energy for customers and cutting the port's carbon footprint.

Construction is being carried out by 3b Construction Ltd and is expected to be completed by the end of the year.

ABP's ports in the North West handle 180,000 tonnes of grain each year, while Garston and Silloth Ports handle close to 800,000 tonnes of cargo each year.

## Port of Vancouver celebrates new rail entrance

On 13 August, the Port of Vancouver USA and its partners cut the ribbon on a \$30 million rail project that will help ensure trains move, goods flow from regional businesses and Washington state remains competitive in the global market.

Known as the trench, the project is a key part of the port's \$275 million West Vancouver Freight Access project (WVFA), which helps reduce regional rail congestion by up to 40%, ensuring businesses along the West Coast and between Portland, Oregon, and Chicago can effectively move products from source to market.

The ribbon cutting featured port officials, US Sen. Maria Cantwell, and representatives from the offices of US Sen. Patty Murray, US Rep. Jaime Herrera Beutler and Gov. Jay Inslee. A crowd of about 100 people from various partner agencies, port businesses and community groups also joined in the celebration.

"Everyone speaking today and many in the audience played a huge part in realizing this project, from Sen. Cantwell's support of freight to Sen. Murray's hard work on the TIGER grant programme, and all those who provided funding for this project," said port CEO Todd Coleman. "We thank you for helping keep the Port of Vancouver, our region and our state competitive."

Sen. Cantwell stressed how critical freight projects like WVFA are to the efficient movement of goods, helping Washington state businesses remain competitive as markets change and trade is increasingly globalized.

"One thing's clear," she said. "Freight can't wait. It has to



move."

And that's just the point of the trench, which eliminates conflicts between trains entering the port and triples the port's rail capacity, allowing tenants to efficiently move products like grain, steel, Subaru vehicles and wind energy components.

The trench was completed \$8 million under budget and ahead of schedule.

The entire WVFA is expected to be complete in 2017, roughly a year ahead of schedule, and about \$50 million under original estimates.

The Port of Vancouver USA is one of the major ports on the Pacific Coast, and its competitive strengths include available land, versatile cargo handling capabilities, vast transportation networks, a skilled labour force and an exceptional level of service to its customers and community.



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## Ghent Port Company and Zeeland Seaports travel to Baltic States to promote the region

The Belgian Ghent Port Company and the Dutch Zeeland Seaports have been jointly promoting the assets of the powerful economic region between Flushing and Ghent for some time already. From Monday 24 up to and including Friday 28 August, both port companies and some 20 businesses and organizations from their ports will be travelling to Estonia, Latvia and Lithuania for the promotion of the ports there. More specifically the sectors of liquid and dry bulk, biochemicals and biomass, fertilizers and agricultural products will be highlighted.

The Ghent–Terneuzen Canal Zone is the life line of the entire region of Zeeland Flanders and Ghent that connects the two medium-sized seaports. When adding up the seaborne cargo traffic of both ports — 61mt (million tonnes) — they form the seventh port of Western Europe. Zeeland Seaports, comprising the ports of Flushing and Terneuzen, is located at the beginning of the Canal Zone, at the Western Scheldt, in the direction of the North Sea. Port of Ghent is situated some 30km further inland. It is important for both ports that existing companies keep on investing there and that new initiatives are developed around the Kluizendok in Ghent and at Axel's Plain, among other regions. For this purpose, a number of commercial activities, fairs, conferences and missions are undertaken jointly.

### BALTIC STATES IMPORTANT TRADING PARTNER

Ghent Port Company and Zeeland Seaports are organizing this trip together and it is headed by both executive directors, respectively Daan Schalck and Jan Lagasse. The aim is to further contacts and trade between the companies from the Ghent–Terneuzen Canal Zone and the Baltic States. With a joint traffic of 4.2mt, the Baltic States are an important trading partner. For Ghent they are the fourth-biggest trading partner (2.1mt) and for Zeeland Seaports they are the fifth (also 2.1mt).

Besides companies, also Portiz (Port & Industry Zeeland), Zeeland Port Promotion Council (ZPPC: comparable to the Flemish Flanders Investment & Trade [FIT]) and Invest in Zeeland will also be travelling along.

### PUTTING PORTS & COMPANIES IN TOUCH WITH ONE ANOTHER

On the first day, Monday, the delegation will be visiting the port of Muuga in Estonia, near the Russian border. On Tuesday, the port of Sillamäe in Estonia will be visited followed by the city of Tallinn. On Wednesday, the port of Riga in Latvia will be paid a visit. In the evening, also the Dutch ambassador Van den Dool and the Belgian honorary consul Gavars will be present. On Tuesday, the delegation will go to Klaipėda, in Lithuania, where the port will be visited. The Dutch ambassador Van der Lingen will also be present in the evening.

During those four days, there will each time be meetings between local companies and Belgian and Dutch firms. On Friday, the mission will be ended in the Lithuanian city of Vilnius.

### ONE STEP FURTHER IN COOPERATION

The joint promotion of the Canal Zone is one step further in the co-operation between Zeeland Seaports and Ghent Port Company. Both port companies have been working together already on the new lock in Terneuzen and on sustainable port development. They are also cooperating on one single port information system for all vessels, shipping agents and companies in the Canal Zone with the aim of carrying out and guiding navigation more smoothly and efficiently. At the end of August 2014, both ports already paid a visit to the port of



*Ghent–Terneuzen Canal.*

Copenhagen–Malmö. The co-operation between these Danish and Swedish ports formed the inspiration for a further cooperation between the Ghent and Zeeland ports. In both cases, it concerns a cooperation between two ports in one single economic zone and in two different countries that join hands in order to develop their port activities.

Last June as well, both ports were together present at the real estate fair Provada in Amsterdam. Moreover, the cross-border bio-based economy is jointly promoted at the renowned 'Biofuels International' fair. The latter will take place in September in the Portuguese city of Porto. As both ports are strong in the transshipment of bulk cargo, they will also be present at the networking event of the IJB Awards, issued by the *International Bulk Journal*. Ghent has already won a number of these much-sought-after awards. In November it is off to the Turkish city of Istanbul for the promotion of the logistical trumps at the 'Logitrans Istanbul' fair.

### GHENT–TERNEUZEN CANAL ZONE: ONE SINGLE ECONOMIC REGION

The Ghent–Terneuzen Canal Zone is centrally located and can serve no fewer than 500 million consumers within a radius of 500km. With a joint seaborne cargo traffic of 61mt, both ports together form the number seven of Europe. Besides, together they also register another 57mt of inland cargo traffic. The Canal Zone is 9,300 hectares large and receives 8,500 seagoing vessels per year. The area counts 80,000 inhabitants, 92,000 workers and over 500 companies. It is good for an added value of €11.5 billion.

In these past few years, huge investments have been made in the improvement of the (maritime) infrastructure: the recently opened Sluiskil tunnel, the new lock in Terneuzen by 2021, improved inland connections between the rivers Seine in France and the Western Scheldt and a faster and safer circulation of traffic on the R4-West and R4-East (the ring road around Ghent port). There is a border-crossing cooperation with Bio Base Europe concerning the bio-based economy: a training centre for operators in Terneuzen and a pilot factory in Ghent port. The Ghent Kluizendok and the Zeeland Axel's Plain form over 700 hectares of space for investments.

The Ghent–Terneuzen Canal is 32km long: 17km on Dutch territory and 15km in Flanders. The Canal has no tides. It has a depth of water of 13.5 metres and is accessible to Panamax vessels up to 92,000dwt having a maximum draught of 12.5 metres.

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## New coal port for Mexico

Mexico's Transport Ministry has awarded a 30-year concession to the San Fernando de Cortez company to undertake the handling of dry bulk traffic at a 2,072,299m<sup>2</sup> area in Sonora. Coal will be the main commodity. The concession also allows for rail discharge facilities to be incorporated to feed a four million tonne stockpile area. Work will be undertaken in phases and cost around \$278 million.

*Barry Cross*

## New shiploaders help Paranaguá break records

The Brazilian port of Paranaguá is claiming a new record for the export of soya. It believes this was achieved in April, when 1.476mt (million tonnes) were loaded onto vessels. This was 2% more than in March and 6% higher than April 2014.

Port officials say that the record was established thanks to the arrival of two new shiploaders, which cost \$18.6 million, but can load 33% more soya than previous equipment. Previously, shiploaders at the port could load at an hourly rate of 1,500tph (tonnes per hour); the new equipment will handle 2,000tph.

In recently released statistics, Paranaguá said it exported 2.8mt of soya in the first four months of the year; 1.5mt of bran and 871,000 tonnes of corn.

Two additional shiploaders are expected to be put into operation by August.

On 10 June, one of its three berths also set a further record, when it loaded 55,000 tonnes of soya in a single day; the previous record had been 44,000 tonnes. In total, the three berths handled a combined 99,000 tonnes on the same day, including consignments of soya, bran, corn and wheat.

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## Sudeste losing major client because of delays in opening

In Brazil, Porto Sudeste has revealed that its client Mineração Usiminas (Musa) has declared its intention of terminating its contract that allows it to export iron ore at the port terminal, which is located in Itaguaí, in the state of Rio de Janeiro.



Porto Sudeste said that it intends to take all necessary means, including arbitration, to prevent this from happening.

The decision taken by Usiminas comes amidst a decline in iron ore prices and also after a delay in starting operations at the terminal, which is still awaiting a licence to begin activities. Currently, the port is due to start operating in the second half of the current year.

The existing terminal can handle up to 50 million tonnes of iron ore annually.

The port is owned by Trafigura and the Abu Dhabi investment fund Mubadala, which has a 65% stake, with other equity belonging to MMX.

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# La Nouvelle to expand into new markets

La Nouvelle, which is the third largest French port on the Mediterranean coast, is in the process of implementing a major new expansion as a means of boosting business and making it possible to enter new markets, such as those in South America, Asia and the West Coast of Africa.

According to Laurent Mouillie, the port authority's Commercial Director, the first of the new port facilities is expected to become operational in 2020.

"We quickly expect to reach a capacity of four million tonnes, thereafter increasing traffic gradually over the forthcoming years," he said.

At present, La Nouvelle is a majority importer of liquid bulk and dry bulk cargoes, although once grain shipments are factored in and liquid bulk excluded it becomes a net exporter. The main dry commodities handled are grain, fertilizer and other agribulks, various minerals, cement, coal, solid bio fuels and biomass.

Port-la-Nouvelle is not connected to inland waterways; however, the new expansion plans envisage a significant rail infrastructure development. Indeed, from the port, it is easy to reach a dedicated north-south freight corridor, serving northern Europe.

The future port will also see an extended role for ever larger bulk carriers. In fact, the project sets out to capture bulk carriers up to about 80,000dwt based on a draught of 14.5 metres, although the port overall will be dredged up to 16 metres.

Significantly, the new facilities already match a long list of environmental regulations, although the overall design has set out to make the least impact possible on the surrounding environment. "Even now, with our existing port, we already promote clean handling and operations," said Mouillie.

He points to the new cement terminal, which is fully pneumatic, prevents any dust discharge into the air, since the importer uses specialist self-discharger vessels only.

The port also includes a 'green zone' where all operational residues are segregated for further treatment.

BC



## Santa Fe port relocation bids invited

In Argentina, the government is attempting to attract interest from companies able to relocate the existing port of Santa Fe to a new location. The new port will be rebuilt on the right-hand bank of the Paraná River at the entrance to the Paraná-Paraguay inland waterway system. On offer is a 33-year concession, with the province of Santa Fe willing to stump up some of the cash. To date, however, terms and conditions of the contract have been such that no bids have been received.

BC

## New bulk terminal for Suape

Odebrecht TransPort (OTP) expects to commence civil works in August at the Brazilian port of Suape on a new dry bulk terminal. These have a budget of \$47 million. The facility is scheduled to open in September 2016 in time for the 2016/2017 harvest, which starts in October/November.

The new terminal will be 75% owned by OTP and 25% by Agrovia. It was initially envisaged as a sugar exporting terminal only, but plans are now being developed to expand its portfolio, with a request being made to Antaq to allow it to import and export soya, bran, barley, malt and wheat. However, this will also involve an expansion of the terminal, requiring an additional \$19 million.

Vessels of up to 35,000dwt will use the new terminal.

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## Brazilian port concessions now to favour upfront payments

The Brazilian government has decided to change the way it awards port concessions. Previously, those bidding with the most competitive tariffs to be charged to customers were favoured. Under a new round of bidding, the emphasis has been put on how much the concessionaire is prepared to stump up for the concession. According to the government, the change in emphasis has come from the private sector. A new block of concessions worth \$2.36 billion is scheduled to be offered to the market in the first half of next year, encompassing some 21 terminals across various ports. These will be located in Rio de Janeiro, Paranaguá, Itaquí, Santana, Manuas, Suape, Sao Sebastiao, Santos, Sao Francisco do Sul and Aratu.

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### Riding the waves of change

Despite the weakness of the global economy, demand for raw materials is still (slowly) growing.

Growing demand in depressed raw commodity and shipping markets turns inevitably into tough competition between traditional suppliers and new mines entering the market.

The shipping market is changing under the influence of many factors:

- ❖ the biggest recession since the 1980s and a downturn that seems likely to continue until 2017;
- ❖ new environmental standards regarding emissions from ships (mainly related to sulphur oxides and nitrogen oxides) will be progressively more stringent and ship owners have to perform accordingly;
- ❖ increasing vessels' size that enable economies of scale;
- ❖ Panama Canal upgrading, offering new opportunities for coal, grains, petcock, bauxite, copper and iron ore trade to Asia;
- ❖ increased reliance on coal as the reliable and cost-effective fuel for power generating; and
- ❖ new general attitude of suppliers or end-users towards the entire supply chain management (Vale, BHP, Adani, etc.);
- ❖ developments in the world economy and trade geographical pattern changes altering common shipping network. To mention just a few cases, the industrial diversification in

Arabian Gulf countries is attracting a remarkable amount of raw material such as iron ore, alumina/bauxite, for intermediate processing of final product. It is expected that India will soon be an importer of iron ore. Power shortages in developing countries attract coal (Egypt, Vietnam, Malaysia, India, Africa, Pakistan, Indonesia, Thailand, Myanmar, etc.).

- ❖ as with the supply side, a number of new power stations and industrial complexes are located in places affected by lack of land or deep water or other factors that hamper the efficiency of the industry supply chain; and
- ❖ last but not least, the increase of environmental awareness in the entire supply chain from mine to industry. These are the latest challenges faced by suppliers, ship-owners, end users and ports facilities.

#### OVERCOMING INFRASTRUCTURE CHALLENGES

The lack of infrastructure and/or port constraints are the most significant challenges to face

The US Geological society ranks Africa among the largest reserves of bauxite, phosphate rock, iron-ore and bauxite exploration and mining. Mozambique may become soon one of the top five coal export countries. The ability to export raw commodities exploiting large shipments will be a key factor for

the development of mine projects.

An effective and efficient supply chain allows for lower delivery costs, providing suppliers and industry with a competitive edge and enabling countries to benefit from trade growth.

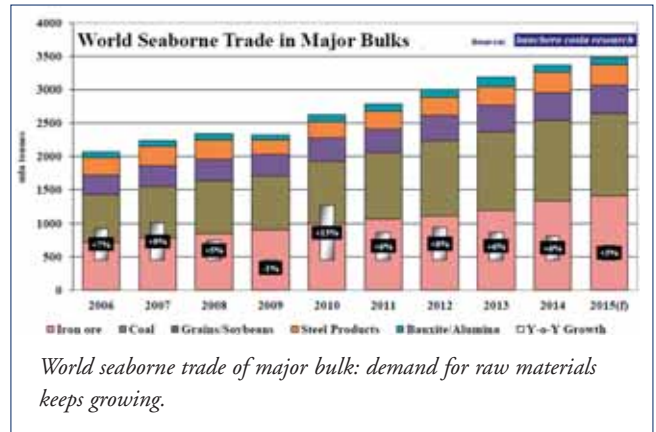
Local draught restriction or other port constraints prevent local and foreign companies benefiting from economical transportation costs associated with large vessel size, unless alternative solutions can be implemented to overcome the logistical bottlenecks.

With economy of scale as a goal, producers and receivers would either need to increase their investment in shore infrastructure considerably or to propose cost-effective alternatives that offer efficiency and reliability in the commodity supply chain.

One of the most discriminating factors to obtain an efficient supply chain solution is the feasibility designing stage. It is at this early project step, that the probability that the project will succeed is assessed.

As the cost of upgrading ports to cope with growing cargo demands and to accommodate increasingly large vessels is not always economically justifiable, alternative supply chain solutions need to be duly evaluated and compared to find the most efficient and sustainable commodity supply chain:

- ❖ **direct shipping:** whenever possible, the most efficient way to bridge supplier and end user is direct shipping, when vessels are either loaded or unloaded directly in a port suitable for receiving them. This scenario requires that suitable deep water is available close to both ends of the supply chain, dredging does not represent an obstacle (both environmentally and in terms of cost) and cargo throughput



World seaborne trade of major bulk: demand for raw materials keeps growing.

(or mine life) justifies the investment in a relatively large port infrastructure. The use of standard 'gearless' or self-unloading vessels depends on the trade-off between shipping and port economics.

- ❖ **lighterage/topping off:** modern fleet of large vessels may be accommodated at loading or receiving ports but not in their fully laden condition. Therefore, in order to fully exploit freight optimization, vessels are partially loaded/unloaded at the closest deep water anchorage site.
- ❖ **full transshipment:** large vessels are completely loaded/unloaded either off-shore (i.e. Indonesia and India) or mid-stream (i.e. New Orleans and Rotterdam) by means of ship-to-barge or barge-to-ship transshipment operations. The most efficient and environmentally sustainable solution can be found by considering the right balance between operational and capital costs and evaluating the trade off between the various alternatives.



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- Project implementation
- Operational support

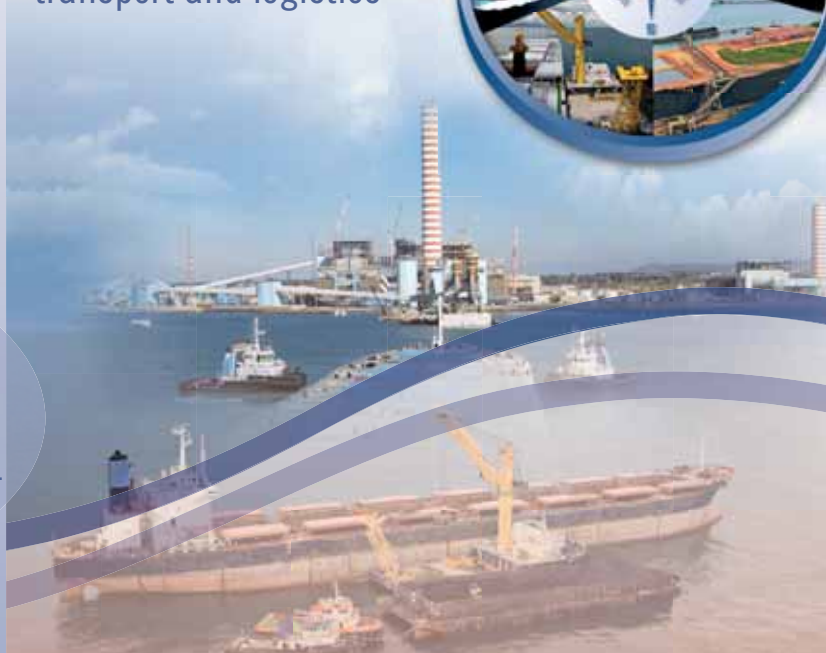
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✓ Advise ✓ Devise ✓ Design

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Together with our clients we compete against their bottlenecks, towards a common goal



Whenever direct shipping is not economically viable, transshipment solutions can be an efficient alternative.

Indonesia is the home of floating terminals according to recent market research by Logmarin: 130 out of about 405 units of different sizes and features recorded worldwide have been counted there.

In any case, floating terminals are not simply alternative solutions to onshore terminals: they can operate in combination with mainland facilities, thus improving overall import/export activity.

As a matter of fact, Logmarin is currently involved in a project requiring integration between existing port facilities and a brand new floating terminal.

With the aim of upgrading the existing terminal at Puerto Santo Tomas de Castilla to cope with the expected increase of bulk material tonnage, Logmarin has devised two newbuilding flat top pontoons, for a total length of about 190 metres and 30 metres width, which are currently at the construction stage in China, under supervision from Logmarin. The two pontoons will be towed to Puerto Santo Tomas de Castilla where they will be connected together, and moored in a fixed position, as an extension of the exiting container terminal. The floating berth will be connected to the shore by means of an adjustable connecting ramp for trucks and mobile ro-ro crane. The floating berth will be primary used to handle coal, petcoke, nickel ore and containers.

#### THE 'LOGMARIN FLEET' IS GROWING

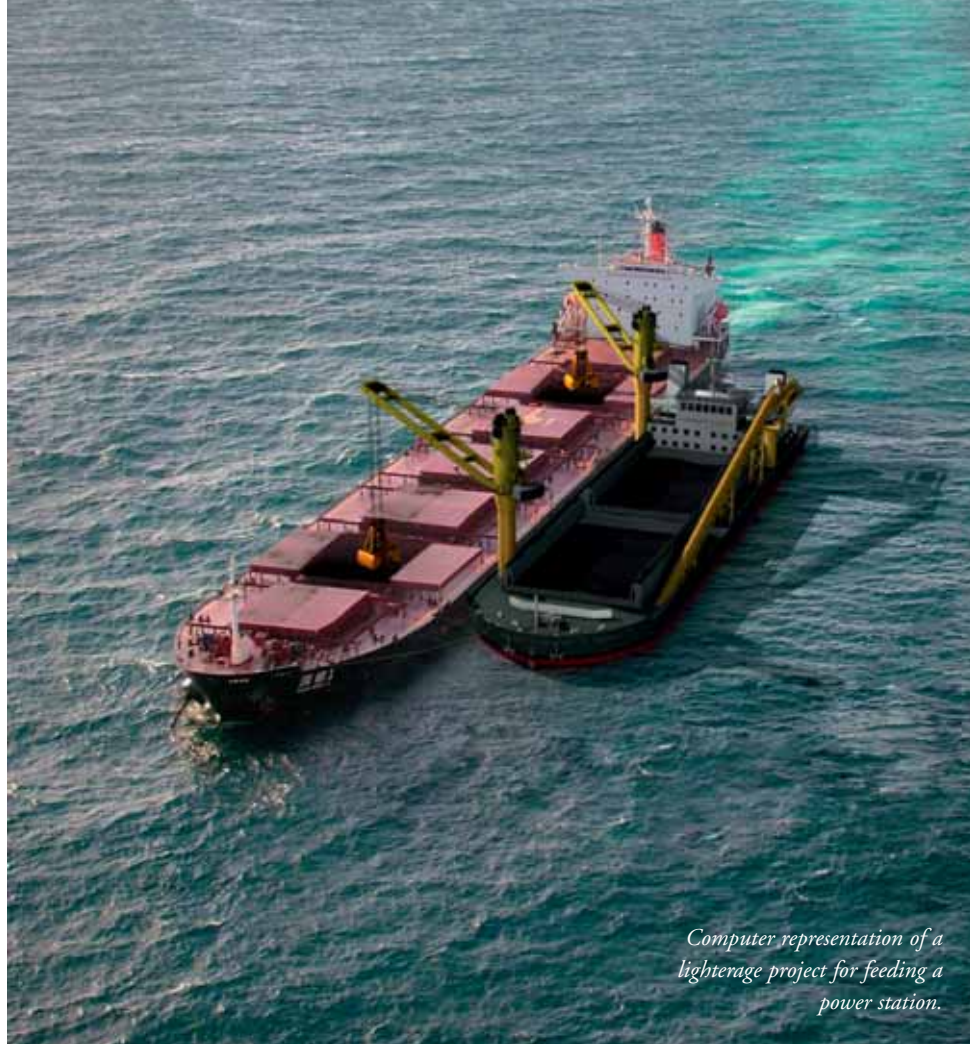
With *Asia Bella* and *Apollo* floating terminals being commissioned this summer, the fleet of floating facilities designed and commissioned by Logmarin totals 22 units of different size and features, which have handled more than 70 million tonnes of dry bulk commodities in the last 12 months.

Among the recently commissioned transshipment units, while *Apollo* has been conceived to carry out homogenous coal blending, *Asia Bella* is a self-propelled floating crane.

Also for these Indonesian flag units, Logmarin carried out project management and supervision during construction and testing.

Thanks to the improvements applied, *Asia Bella* is different from conventional floating cranes. A few notable features include:

- ❖ storage allowing a buffer of about 3,000 tonnes, useful for balancing and trimming of vessel, thus avoiding return cargo on the last barge;
- ❖ less sensitivity to adverse weather conditions thanks to the combined 'roll damping systems' for the attenuation of pontoon rolling motions;
- ❖ the first unit classified by RINA as a 'transshipper';
- ❖ self-propelled; and



*Computer representation of a lighterage project for feeding a power station.*

- ❖ efficient, burning just a glass of gas oil for each grab of coal handled.

*FC Asia Bella* has been equipped with 2 x 550kW (750BHP each), SRP 330 FP Schottel Z-drive rudder propellers in nozzle.

Thanks to the 1,400mm diameter pitch propellers, *Asia Bella* is capable of:

- ❖ sailing at a maximum speed of 7.5kN, service speed 6kN;
- ❖ manoeuvring without any tugboat assistance;
- ❖ turning on the spot and moving sideways;
- ❖ facilitating barge unberthing manoeuvring; and
- ❖ sailing with one propulsion system temporarily out of service.

Installation, commissioning, training and sea trials at Chengxi shipyard have been successfully performed by Schottel Far East Singapore.

Schottel, which is recognized worldwide as a propulsion expert, is a Germany-based company specialized in design, production and marketing of azimuthing propulsion and manoeuvring systems, as well as complete propulsion systems for vessels of all sizes and types.

More than ever, commodity supply chain design requires complex and integrated multidisciplinary efforts (technical, financial, geological, operative, maritime, civil, logistics, environmental, fiscal background) to be co-ordinated by a 'logistics mind' to seek efficiency, optimization and sustainability.

Logmarin has been deeply involved in supporting activities to power plants, mines, terminals, etc — in particular focusing on environmental issues and safety requirements concerning coal supply chain of power station.

Among others, Enel, Vale, Egat, Marubeni, Kepco, AES, Banpu, Odebrecht, Golden Bay Cement, etc have already benefited from Logmarin's expertise and open-minded approach for their greenfield projects.

**LOG.DES A KEY TOOL TO EMPOWER CLIENT DECISION**



*Example of direct shipping:  
Logmarin's contribution to  
bridge the gap between  
supplier and end-user.*

Logmarin has implemented Log.Des, a professional simulation software — developed on Witness Computing Platform — to assess the efficiency of the complete supply chain process.

Through 'Log.Des' and on behalf of the clients, Logmarin creates a tailor-made real and accurate model of the client's logistical process in a dynamic-animated computer environment to estimate and foresee the dynamic development of the events, simulated in a low-risk environment, and to identify the optimal solution for any end-to-end commodity supply chain.

Log.Des provides a complete view of the logistic system. It allows studying and analysing the interaction between every single component of the system, in order to evaluate the impact of potential changes before their occurrences, to assess performance in different operating conditions and to check analytical results. Log.Des is capable of handling the complexity of a logistic system and includes the randomness and variability that can be seen in real life, therefore it is not guessing, but planning with foresight.

The first step is to collect the input data and the information necessary for the model construction. Log.Des takes into account different kinds of input and bottlenecks, specifically applicable for dry bulk supply chains. Information on mine productions, in-land transport, terminal characteristics, physical and environmental constraints, cargo handling equipment details, and storage facilities information is included in the model as well as data on tide variation, navigation restrictions, ocean going vessels type, freights, etc. In this first phase, the logic and operational rules behind the logistic process are translated into the software language to allow the model representing the real process.

After the development and the validation of the tailor-made model, Log.Des is ready to represent dynamically the real world process, to evaluate alternative 'what-if?' scenarios, to identify the optimal solution and to explore the potential effect of changes on equipment, throughput, costs, sustainability and risks (sensitivity analyses).

The output data returned by Log.Des have to be examined by an experienced team in order to estimate the actual efficiency, demurrage risks and annual throughput of the logistics in alternative scenarios and finally identify the optimal solution in terms of cost savings and environmental impact.

Comparing the resulting supply chain alternatives, the most efficient scenario in terms of operability, costs and sustainability — based on available information, main assumptions and client's requests — will be selected.

Log.Des helps the end-user's decision-makers to understand potential opportunities and risks right at a very preliminary stage of the project, assessing possible weakness and bottlenecks beforehand — rather than investing too much time and money in carrying out salvage operations later on after an 'unexpected fiasco'. In short, to 'get it right first time'.

## CONCLUSIONS

In the present day scenario, companies that want to be competitive cannot continue to simply offer standard solutions to their clients, but they need to adapt their thinking to requirements of modern day demands and to their clients' specific needs.

The 'theoretical' knowledge has to be applied to the realm of practicality and they have to be merged together to put forth an effective design; this is part of the due diligence that a supply chain project requires.

The importance of a global approach to the supply chain, the 'door-to-door' principle, has been recognized by Logmarin Advisors since the company was launched under the aegis of Rina, the Italian Classification Society, IACS founder.

Logmarin works closely with its clients, competing alongside them against bottlenecks in their commodity supply chain as a team to strategize, execute and score the winning goal. That's why it has long-lasting relationships with its clients and they keep coming back to Logmarin for its services.



## Offshore contracts TTS Group ASA

### TTS: NEW OFFSHORE AND DECK CRANE CONTRACTS

TTS Group ASA has, through its Business Unit Offshore, entered into three new agreements for delivery of offshore and deck cranes with a total order value of approximately 105 million NOK (Norwegian krone).

The main contract is with Triyards Marine Services Pte Ltd. in Singapore for delivery of two active heavy compensated (AHC) subsea cranes for two vessels contracted by an Indian owner. The deliveries will take place in the second and third quarter of 2016.

The two other contracts are for shipyards respectively in Argentina and Norway. The Argentinian yard has ordered three deck cranes for a product carrier. Delivery will be in approximately ten months. For the Norwegian shipyard Kleven Verft, TTS will deliver deck cranes for six offshore vessels to be built for Maersk. The delivery time will be 12–16 months.

TTS has reinforced its position within the midsize crane segments.

“Although the offshore market is in a very vulnerable position, we are actively working on segments showing growth. One is Offshore Support and Supply Vessels (OSV and PSV), where there is a need for AHC technology on medium-sized cranes with 80–150 tonnes’ lifting capacity. The order for Triyards is a result of this,” says Björn Anderson, CEO of TTS Group ASA.

### TTS Group signs breakthrough marine package equipment order in China

TTS Group ASA has got off to a flying start for its newly established 50/50 Chinese joint venture company, TTS-SCM Marine and Offshore Machinery Co., Ltd. The company has signed agreements with Shanghai Shipyard Co. Ltd, ensuring delivery of various items of TTS deck equipment for six ships. Total order value is NOK 270 million.

The contract includes mainly heavy lift cranes to the ongoing fleet extension program of China Ocean Shipping (Group) Company (COSCO). In addition, TTS will deliver hatch covers and winches to COSCO through another 50/50 joint venture company, TTS Hua Hai. The delivery of the first ship will be in May 2016.

“The order represents a further belief in the strategic model TTS has chosen for the important Chinese market,” says Björn Anderson, CEO of TTS Group ASA. “Localization of critical business projects in combination with key account ship type packages ensures the successful roll-out plan for TTS growth strategy,” Andersson adds.

### ENHANCING HEAVY LIFT MARKET

For several years already TTS has had a successful joint venture experience in China, and is an important player in the Chinese market coming to e.g. hatch covers, winches and some types of cranes. By establishing TTS-SCM Marine and Offshore Machinery Co, TTS Group has taken another step forward with specific regard to the market for heavy lift cranes.

The company shall benefit from what TTS already has achieved. Based on well-proven TTS technology and experience, as well as good relations, the new company is well prepared to deliver heavy lift cranes, constituting the majority part of the new contracts.

TTS and COSCO are already well known to each other,

through several deliveries. “We are proud that such an important customer as China’s COSCO Group has decided to choose TTS again. It clearly shows that our focus on customer satisfaction is the key to success in the long-term strategy,” Anderson says.

### MULTIPURPOSE VESSELS

The TTS deck equipment delivery are for six 28,000dwt Multipurpose Heavy Lift Vessels. COSCO already operates eight identically constructed vessels. Each ship is equipped with the proven TTS NMF type DK II, two with SWL 350t and one with 100t lifting capacity.

The order is placed by Shanghai Shipyard Co. Ltd., part of the China State Shipbuilding Corporation (CSSC).

“This contract is a milestone for our new company, as well for the TTS Group,” says CEO Björn Anderson. “We have firmly believed that the new company will improve and gain a competitive position in the market. Now we have the first proof for choosing a proper strategy,” he says

“As initial order for the new Joint Venture it is a very important project for TTS, SCM and CSSC,” says Geir Storaas, Chairman of TTS SCM. “The new Joint Venture allows us to combine high end technology with a most competitive position in the heavy lift market,” he adds.

### BASED ON EXPERIENCE

Formally the new joint venture company is established by TTS subsidiary, TTS NMF, based in Hamburg, Germany in partnership with CSSC-controlled South China Marine Machinery. TTS NMF has been the leading global provider of heavy lift cranes for decades and in order to maintain this position, TTS now ramps up its heavy lift crane operations in the Middle Kingdom.

The company will target a market where the shipbuilding has predominantly moved to China. The company will focus on heavy lift cranes for general cargo and multipurpose vessels as well as on the market for various offshore workboats and supply vessels.

In addition to reducing costs and securing market access, the establishment of the new company is also a response to stronger demands from Chinese authorities that equipment for vessels built by Chinese yards ought to be made in China.

“In many ways, the Chinese are now creating the same kind of maritime infrastructure as Japan did in the 1970s, and the TTS Group intends to be a part of this development. While other internationals increasingly turn away from partnerships with Chinese players and start their own businesses on Chinese soil from scratch, joint ventures will continue to be TTS’s preferred avenue for getting a stake in the Chinese market for cargo handling solutions. We believe that a joint development on equal footing will be the best for both parties and also find it natural to support CSSC’s strategy of localizing the entire value chain close to their main market,” says Björn Andersson.

Although the majority of the ship-owners in the general cargo/multipurpose vessel segment are still European, they will face strong competition from Chinese players in the future. China Ocean Shipping Company (COSCO) has expressed a clear ambition to become the world’s largest general cargo/multipurpose vessel fleet operator.

### OFFERS FULL RANGE OF HEAVY-LIFT CRANES

TTS-SCM will offer marine cranes from 100 to 800 tonnes,



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- Mobile cranes
- Harbour cranes
- Trolley cranes
- Bucket wheel unloaders
- Pontoons
  
- Dredging
- Bulk handling
- Hoisting
- Pile-driving.
  
- Diesel-Hydraulic
- Electric-Hydraulic
- Electric
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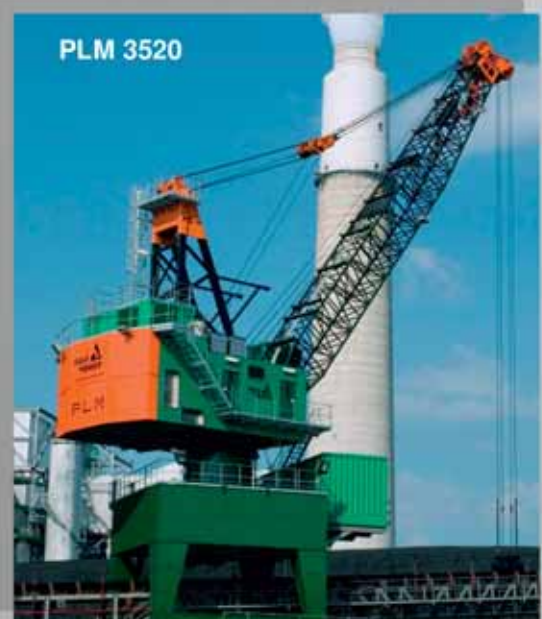
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PLM T450



PLM 3520



suitable for a range of heavy lifts and project cargo, as well as lattice boom cranes up to 1,500 tonnes for various offshore work boats and supply vessels. The company will carry out development, design, manufacturing and assembly of cranes.

“By combining TTS NMF’s design and state-of-the-art technology with the utilization of local production facilities, the new joint venture will be able to offer a wide range of TTS-branded heavy lift cranes to CSSC and other important Chinese shipbuilders — with the advantages of competitive pricing and quick delivery. I believe that the new company will be an obvious contender for the heavyweight title in the Chinese crane market,” says Andersson.

The new joint venture is located in Guangzhou, the capital and the largest city of the Guangdong province in South China and an important trade and industry hub.

#### THE TTS GROUP

The TTS Group ASA is an international group that develops and supplies equipment, cargo handling solutions and associated services for the marine and offshore industries.

The TTS Group’s global operations counts a total of 1,100 employees with an emphasis on engineering skills. The group has subsidiaries in Brazil, Finland, Greece, Italy, China, Korea, Norway, Poland, Singapore, Sweden, Germany, USA and Vietnam.

## LD Ports & Logistics: improving the efficiency of transshipment operations through intelligent scheduling and control

*Floating terminal multiple loading — intelligent scheduling.*



LD Ports & Logistics has developed powerful calculation software, BATOS (Barging And Transshipment Optimization Software) able to determine in a few seconds the best loading schedule complying with an extensive list of operational inputs (OGV balance draught survey, hold completion, wheel loader transfer, barge initial and final survey etc.) enabling a very high degree of realism in the modelling.

The solving process is a multi-level optimization which combines a linear solving system (simplex) with an enhanced genetic algorithm. This complex solving method enables to find solution to difficult optimization issues, like operating globally a transshipment terminal, from shore facilities to final loading of the ocean going vessel at anchorage.

The software tests every possible combination and keeps the most efficient one, thereby minimizing operation costs (despatch and demurrage, fuel consumption) and improving the performance through and intelligent scheduling and control. BATOS creates value to the end user allowing significant savings on freight and demurrage. With optimized barges cycles and floating cranes movements the software has demonstrated that floating terminal loading rate can be increase by +20% compared to a non-optimized case.

BATOS also includes a Monte-Carlo application (mathematical method to account for risk in quantitative analysis) to run simulations on the laycan schedule and shipping plan over thousands of scenarios. This application is used to evaluate all the possible ships’ arrival outcomes and their impact on the transshipment terminal.

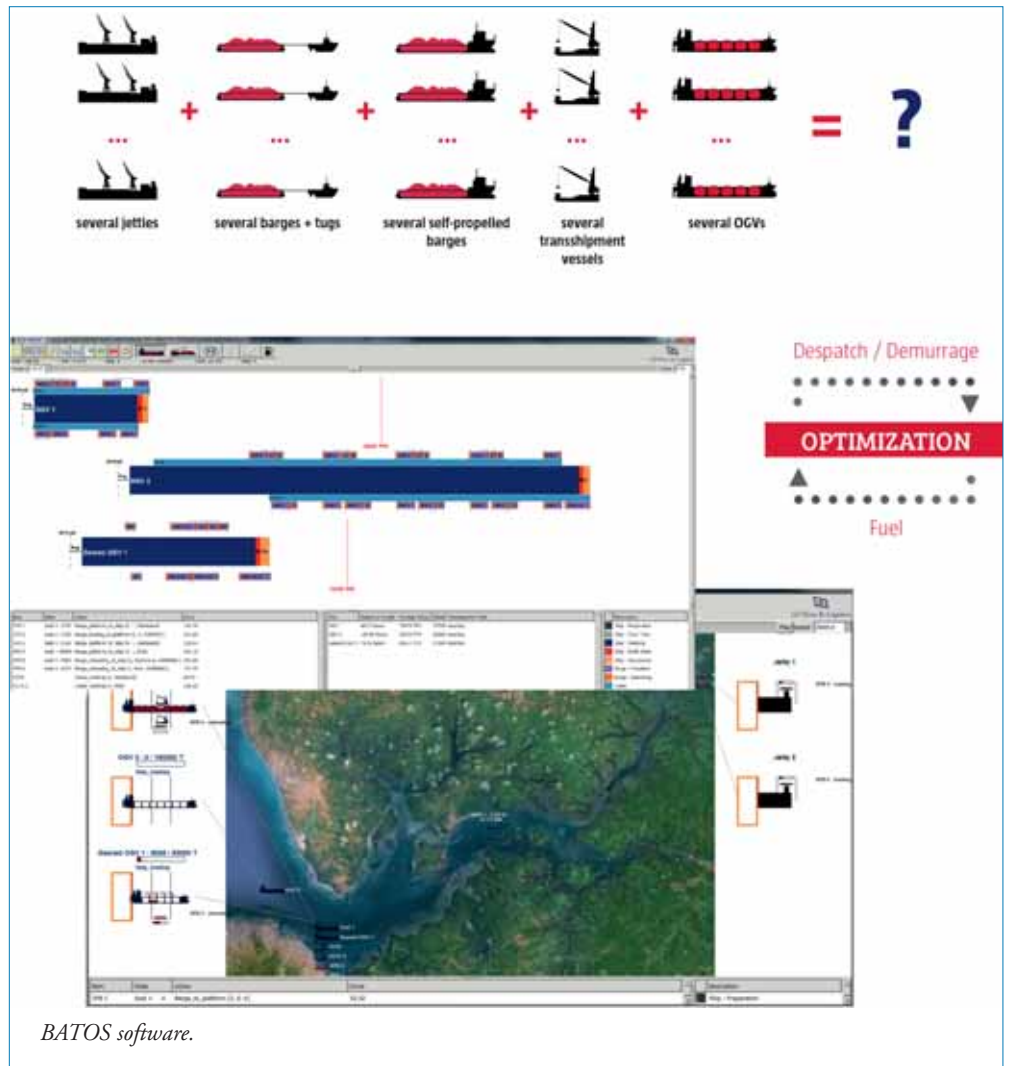
Leading efficient transshipment operations is neither intuitive nor simple, especially on a large scale floating terminal involving several ocean going vessels and many floating cranes at the same time. Being more than a simple simulation software, BATOS has become an unrivalled tool to compare different transshipment solutions and improve significantly operational efficiency.

The software allows designing a fit-for-purpose solution to cope with the requirements and specification of each transshipment project (providing export solution to a mining company or supply a coal-fired power plant). “Performance is not only a target it has to be an achievement,” recalls Capt. Emmanuel Dür, General Manager of LDPL whose strategy is to design build and operate its own tailored transshipment vessels. The careful selection of equipment and handling process (grab, conveyors, or a combination of both) is critical to ensure a reliable supply, even in remote environments where maintenance of off-shore transshipment vessels can be a challenge.

Built with a meticulous selection of highly reliable technology and equipment floating cranes transshipment units (FCTUs) have successfully demonstrated firstly in India, then in West Africa that the concept of a 100% self-sufficient and easy to operate transshipment vessel is achievable. The FCTU is self-propelled by the mean of two azimuthal propulsion systems (no need of assist tug for berthing or coming alongside vessels) and is fitted with its ‘on-board’ maintenance workshop and equipment so as to realize most of the regular works autonomously. Simplicity and efficiency have proven to be two major ingredients to excel in the art of transshipment and ensure continuous performance.

The absence of complicated conveyor systems combined with the full ban of hydraulic systems on board dramatically simplify maintenance procedures and reduce breakdown risk, whatever are the constraints of specific minerals. FCTU MIRAMAR (owned by LDPL) has been exceeding expectations by far in terms of performance, demonstrating capabilities to reach up to 1,565 tonnes per hour (37,560TPD) top rate recorded during a full loading of iron ore on a Panamax in Africa last year. Such performance has called into question the legitimacy of using sophisticated transshipment vessels equipped with complex conveyors systems, which can barely reach similar rate handling various quality materials while having proved very limited reliability in remote and difficult environment.

Several FCTUs can be combined to load simultaneously a Capesize vessel and achieve loading rate above 75,000 tonnes per day. The use of BATOS software is then a critical advantage to calculate the best loading sequence and optimize the synchronization of all the FCTUs and shuttle vessels employed to supply cargo at the transshipment anchorage.



BATOS software.

**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 the 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 acquired also an extensive experience in development of shallow water solutions in order to 'feed' floating terminals.





# Topcon acquires Digi-Star

Topcon Positioning Group has acquired Digi-Star, a Fort Atkinson, Wisconsin-based global provider of agricultural solutions involving weight sensors and control systems for feeding, planting, fertilizer, and harvest equipment manufacturers.

"After several years of working on development projects together, we are delighted with this acquisition," said Ray O'Connor, president and CEO of Topcon Positioning Group. "Digi-Star and Topcon Precision Agriculture are a perfect fit, bringing complementary technologies and distribution channels to our rapidly growing precision agricultural division. At a time when many companies are decreasing their investment in agricultural markets, we are increasingly optimistic about their growth based upon our strong commitment to developing management systems and solutions that bring the power of the Internet of Things (IoT) to every farm."

Digi-Star is a global supplier of electronic equipment, precision sensors, optical yield and feed management sensors, displays, position verification, and software used by farmers and other equipment operators to precisely measure and analyse valuable data from critical farming processes.

With more than 220 employees in Fort Atkinson, the

Netherlands and the United Kingdom, approximately half being located in the US or Europe, Digi-Star's operations will continue to be based in Fort Atkinson to provide manufacturers, dealers, and end-users a high level of service, support, and product expertise.

O'Connor noted that Digi-Star has a unique balance of expertise in the livestock and grain equipment markets.

In 2012, Digi-Star purchased RDS Technology, a United Kingdom-based company, which possesses similar technology for agricultural and construction applications — adding engineering, development and manufacturing facilities in Europe.

"We are very enthusiastic about the opportunity of combining these companies. In addition to expanding our reach into the farm market segment, this will further extend our scope of field solutions to help us continue strong growth while serving an expanded customer base for Topcon Precision Agriculture, for the aftermarket and original equipment manufacturer (OEM) clients," said Albert Zahalka, president of Topcon Precision Agriculture. "We are also excited to add the skilled employees and world-class facilities located in the Midwestern United States, the United Kingdom and the Netherlands to our global agricultural family."



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## 4B Braime launches new website

4B Braime Components, a worldwide manufacturer of material handling and electronic components for bucket elevators and conveyors, has just announced the launch of its new company website ([www.go4b.co.uk](http://www.go4b.co.uk)), which comes with an extended product section, streamlined navigation and improved multi-lingual features.

Structured into three main applications — bucket elevator components, chain conveyor components and electronic monitoring equipment — the product section provides comprehensive information, all in an easy to use format. Each product is presented with detailed technical information and advice, including manuals, certificates, CAD drawings, installation guides, videos, FAQs, etc. as well as links to accessories and other relevant products.

4B Braime says that feedback from 4B's customers has so far been very positive, with customers finding the new site convenient to use, professional and very engaging.

The 4B website has become a reference for many people in the bulk handling industry. In an industry where many components are sold as part of a system through OEM or



through resellers and can be used in the field for many years, end users usually turn to the internet to find technical information.

“Many users pick up one of our components in the field, and they need to be able to identify the part and find relevant information on how to operate their product or how to find a suitable replacement”, explains 4B Braime. “As a manufacturer, we need to make sure that they find the necessary information or are put in contact with a local 4B representative who can help them.”

### ABOUT 4B BRAIME ELEVATOR COMPONENTS

Founded in the 1971 as a subsidiary of The Braime Group, 4B Braime Components has been an industry leader in developing high quality, innovative, and dependable material handling components for the

agricultural and industrial sectors. 4B's product line ranges from elevator buckets, elevator bolts and drop forged conveyor chain to level monitors, speed switches and hazard monitoring systems. With offices in North America, Europe, Asia, Africa and Australia along with a worldwide network of distributors, 4B can provide practical solutions for applications in any location.

## Konecranes and Terex Merge

The Boards of Directors of Konecranes Plc and Terex have approved an agreement to combine their businesses in a merger of equals. The combined company, to be called Konecranes Terex Plc, will be a leading global Lifting and Material Handling Solutions Company with estimated combined 2014 revenues and EBITDA of €7.5 (\$10.0 billion) and €636 (\$845 million).

The combination will bring together leading companies in lifting, materials handling, and equipment servicing solutions. Konecranes Terex will be parent to a family of leading brands with global leadership positions in the industrial lifting, port solutions, aerial work platforms, materials processing and cranes categories. The combined company says it will be able to offer comprehensive solutions to customers worldwide based on a highly complementary product portfolio.

Konecranes Terex believes it will have the critical scale to continue to drive technology innovation and provide customers with an industry-leading service. The combined company is expected to create enhanced shareholder value through:

- ❖ increased global scale with enhanced ability to remain competitive *via-à-vis* intensifying global, in particularly low-cost emerging market competition;
- ❖ broader presence in key sectors with greater opportunity to capitalize on growth trends, especially in industrial lifting and port solutions;
- ❖ creation of a global service organization of critical

mass and scope;

- ❖ more robust portfolio of complementary products and customer solutions;
- ❖ significant operational and financial synergies; and
- ❖ strong balance sheet and cash flow generation to support growth and return of capital to shareholders.

Stig Gustavson, chairman of the board of Konecranes, said: “The combination of Konecranes and Terex is a defining step in the history of both companies. With a focus on Lifting and Material Handling solutions, Konecranes Terex will be in an excellent position to deliver enhanced growth in revenues and margins through several strategic advantages, including significant cross-selling opportunities. There is a common culture between the two organizations, with both companies having long histories of designing competitive and innovative solutions. Together, we will have the opportunity to expand what Konecranes and Terex have built and become even stronger in the future.”

Terex CEO, Ron DeFeo, said, “This merger brings together two great businesses and through synergies provides another lever that is within our control to deliver value-creation to both the shareholders of Terex and Konecranes. We have a deep respect for Konecranes and look forward to joining forces with them to build a stronger and more diverse company that will be in an excellent position to succeed in a dynamic and highly competitive global industry.”

## Eriez strengthens its engineering team

### ERIEZ APPOINTS GLENN KIERNAN TO THE POSITION OF ENGINEERING MANAGER IN SOUTH WALES, UK

Glenn Kiernan joins Eriez Europe with extensive design, R&D and manufacturing experience, gained in the mining, plastic and engineering industries. In past roles, he has been involved in many aspects of business from designing and machining, research and procurement, to project management and operations, providing the solid, well-rounded skills required for the Engineering Manager role.

In his new position, Kiernan will be utilizing his unique depth of experience and knowledge to lead and strengthen the existing skills of the engineering team at Eriez Europe as the company continues to develop and create first-class solutions in separation equipment.

Kiernan is no stranger to Eriez having been introduced to the company in 2008 when he joined the Australian affiliate office as a design engineer and later relocating to Eriez China where he was appointed Deputy General Manager, residing there before taking on his new role.

On his appointment, John Curwen, Managing Director at Eriez says: "We are delighted to welcome Glenn to Eriez Europe. His



*Eriez self-cleaning suspended magnet.*

experience and knowledge adds to the wealth of skills we have in our Engineering Department and will move the company forwards in not only developing and improving our existing products, but also creating new, innovative solutions. With changing market conditions, we recognize the importance in continually developing our products to meet the needs of the many industries we serve and we look forward to Glenn leading our team to do this."

Eriez Magnetics is recognized as world authority in separation technologies. The company's magnetic lift and separation, metal detection, materials feeding, screening, conveying and controlling equipment have application in the process, metalworking, packaging, plastics, rubber, recycling, mining, aggregate and textile industries. Eriez manufactures and markets these products through 12 international facilities located on six continents. Eriez Europe Ltd. has its head office in Caerphilly, South Wales, UK.



*Glenn Kiernan.*

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# VIKING moves to expand Australasian activities

VIKING Life-Saving Equipment A/S has announced it has acquired a part of Australia-based Wiltrading Pty Ltd.'s maritime safety equipment activities effective 1 September.

This move strengthens VIKING's offering in Australasia, adding four locations to the company's global network of wholly-owned servicing stations as well as several products and services, bringing new advantages for shipowners and offshore operators in the region.

A subsidiary of Wilh. Wilhelmsen Investments (WWI), Wiltrading offers integrated activities in marine safety, fire fighting and protection, equipment and servicing, serving the offshore, oil and gas, shipping, military and cruise industries. The company is an authorized representative and service partner for a wide variety of maritime and offshore equipment producers.

Under the new agreement, selected safety equipment and servicing activities previously managed by Wiltrading will be seamlessly integrated into the global VIKING organization, offered and serviced locally, whereas remaining activities will be carried out in close cooperation between the two. VIKING's CEO, Henrik Uhd Christensen, welcomes the new addition to his company's constantly expanding worldwide presence and the growth opportunities it provides in the region:

"We've worked in close partnership with Wiltrading for several years," he said. "They are a professional organization with a strong, service-minded approach to customers — something that makes these activities and the people who operate them an excellent fit for VIKING. We strive to be close to our customers,

so we can support their competitiveness with fixed prices, flexibility and fast delivery no matter where they operate."

At the same time General Manager of Wiltrading, Michael Connolly is pleased that VIKING and Wiltrading can continue their respective growth activities, for example through their popular VIKING Shipowner Agreements:

"With the VIKING Shipowner Agreement rapidly winning favour in the market, and plans for even more capabilities in the future, VIKING has much to offer Wiltrading's customers and staff. We have always had a great deal of respect for the company, and are really looking forward to leveraging VIKING's global network resources."

Brian Jacobsen has been appointed Country Manager for VIKING Australia. He is a former VIKING sales and marketing director, and started the company's Singapore office several years ago. He has recently returned to VIKING.

VIKING Life-Saving Equipment A/S is a global market supplier of maritime and offshore safety solutions, providing and servicing safety and fire-fighting equipment for passenger and cargo ships, offshore installations, fishing vessels, the navy, fire departments and leisure yachts.

VIKING is a privately held corporation founded in 1960 with group headquarters in Esbjerg, Denmark. Products are manufactured in Denmark, Norway, Bulgaria and Thailand. VIKING offers a broad range of off-the-shelf and tailored safety solutions and systems certified in accordance with the latest requirements of the IMO, SOLAS, EU and USCG.

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# Buttimer Engineering in focus



## Mechanical handling, DOCKSOLID mobile equipment, bulk terminals & dust control

“We can’t be all things to all people” says Fergal Buttimer, Managing Director of Buttimer Engineering, discussing the company’s diverse offerings in the ports sector. “Our core capability is an expertise in the mechanical handling of dry bulk product — our challenge is to offer that expertise to our clients in the way that best meets their needs.” Last year Buttimer introduced a new brand, DOCKSOLID Bulk Port Equipment, a milestone for the company as it streamlines its diverse capabilities into distinct service propositions. The company has been a contractor, a design consultant, a turnkey EPC project management company and an OEM equipment producer. Buttimer’s experience and capabilities suggest a spectrum of opportunities — the challenge, as they describe it, is to make the right expertise available at the right moment, to the right customer.

DOCKSOLID Bulk Port Equipment is the result of more than two decades designing, refining and maintaining ship unloading hopper systems. The project initially started as a series of *ad-hoc* customer requests for mobile bulk handling hoppers, loaded with a grab as it unloaded a vessel. Customers also wanted a means of preventing and suppressing airborne dust occurring as they

handled certain bulk products at their terminal. Through an iterative design process, Buttimer has arrived at a range of dust control techniques and innovative modifications to create hoppers which mitigate successfully their impact on the environment — not only by greatly reducing emitted dust, but also through more fuel efficient generators, lower energy use, noise pollution reduction and cutting-edge health and safety features.

DOCKSOLID hoppers compete on their state-of-the-art dust control techniques, but also on their reliability. The design mantra of Sean O’Sullivan, the Senior Design Engineer for DOCKSOLID equipment is that simplicity trumps complexity — not just for consistent design parameters, and reliable mechanical performance, but because simpler designs are easier to use, easier to maintain, easier to repair if something goes wrong and therefore have greater availability and longevity for the operator. Simplicity is not just a lack of complexity, it requires sophistication of design developed from both first principals and a hands-on practical knowledge of a busy port environment. DOCKSOLID hoppers are designed with a detailed understanding of the impact and dynamic forces and



loads exerted during the unloading and flow of the specified dry bulk cargo, explains O'Sullivan, to ensure a robust structure and frame; the hoppers have to be 'fit-for-purpose' in a demanding environment. Flexibility of use is also identified as a core feature of the DOCKSOLID range — particularly the manoeuvrability of mobile units, for fast repositioning between hatches of a vessel, or getting to and from the quay wall in a multipurpose terminal, for example. The wheel-mounted units have an impressively narrow turning radius, and agility that belies their stature and sizeable frames.

Though designing, fabricating and delivering ship unloading hopper solutions has been part of Buttimer's business for decades, it is just one part. The introduction of the DOCKSOLID range last year was to enable a streamlining of the design, delivery and sales of this equipment — and also to differentiate it from the more project engineering focus of Buttimer's primary activities. Separating out DOCKSOLID as an OEM offering, allows better focus on streamlining and optimizing DOCKSOLID's design, production and delivery. Separately, and unconstrained by the standardized processes of an equipment manufacturer, Buttimer Engineering can continue to offer consultancy, design, project management and installation services to port terminals and dry bulk handling industries.

The substantial growth in the Polish economy, and in particular the expansion, modernization and industrialization of the country's northern agriculture and animal feeds markets has fuelled significant investment in agri-bulk terminals along Poland's Baltic coastline — around Gdynia, Gdansk, Szczecin and all along the coast. Buttimer Engineering has now been operating in Poland for a decade and in recent years has contributed its engineering knowledge to the design and installation of a number of grain and oilseed handling terminals in the region. Primarily used for animal feedstuffs, and in the processed food sector, soybean meal is a sticky, dusty product. It requires carefully designed transfer points, spark resistant conveying systems and thorough aspiration and dust control planning. Buttimer Engineering has designed, installed and commissioned state-of-the-art bulk terminals for both import and export of

bulk soybean meal, as well as rapeseed, wheat, cereals and other agri-bulks in Swinoujscie, Gdynia, Gdansk and Szczecin. The company's expertise in bulk grain handling stretches back to a long history in the feed milling sector in Ireland, as well as designing and delivering dry product handling facilities for large agri-industry companies such as Dairygold, Diageo and Bunge.

Buttimer Engineering's services to the ports sector all stem from the company's mechanical handling expertise but take different forms depending on the project scope, client requirements, tender and project management scenarios. For example, the company is currently working as an on-site contractor for the installation of a new waste-energy handling facility at the Port of Liverpool; providing specialist personnel for the erection and commissioning of a materials intake and conveying system. Buttimer has delivered design, fabrication, on-site specialist labour and project delivery (EPC) services to bulk terminals in Ireland, the UK, Poland as well as consulting and advisory services for terminals internationally, including the Middle East and Africa. The company's core expertise in dry bulk materials handling systems, as identified by Fergal Buttimer, is thus applicable to a wide range of services and sectors. This expertise encompasses both a detailed theoretical understanding of how bulk commodities move — their flow characteristics, their heating and moisture properties, their compaction and bridging tendencies, their dust emission — and a hands-on knowledge of structural and mechanical design principals and parameters. Buttimer prides itself on a pragmatic approach to engineering, coupling a detailed engineering knowledge with the sort of hands-on experience and "knowing what works, and what doesn't" that only comes with more than three decades in business.

Buttimer's materials handling credentials extend far beyond just ports; the company has designed and delivered dry bulk handling systems across sectors as diverse as mining, pharmaceuticals, agriculture and power generation. The diversity of sectors poses a challenge for Buttimer, admits Joseph Cummins who works in business development for the company; the need to deliver a clear offering and streamlined service to





clients competes with the complexity of managing a company that is interchangeably a design engineer, a consultant, a contractor and an OEM supplier. The creation of the DOCKSOLID brand, as well as building a separate equipment supply process, has been an important step in delivering value for clients with diverse requirements efficiently and quickly. The company proposes that a focus on the needs of a client, rather than the scope of the offering, tends to give Buttimer Engineering the flexibility to deliver an appropriate solution or service, regardless what stage the project or problem is at. The 'fit-for-purpose' approach to DOCKSOLID hopper design is also applied to how Buttimer deliver their expertise in other areas as well; getting a solution that works for the customer is paramount — rather than maximizing individual contract value, Buttimer's strategy is to build a reputation for effectiveness and reliability with their customers, and grow through repeat business.

The dry bulk terminals and global trade sectors are going through 'interesting times' again! Growth has been stagnant for the last few years despite the global economy regaining some pace following the 2008 financial crisis. Weaker-than-expected growth in Chinese industrial imports, weak growth and ongoing fiscal austerity in much of Europe, as well as low oil and commodity prices, have also effected investments in new build and upgrading of bulk handling capacity — with some notable exceptions, especially in Eastern Europe and parts of South



America as well as stronger economic activity in the US and UK. The opening of the expanded Panama Canal, followed by the rapid expansion of the Suez Canal by the Egyptian government, will also change some of the trade economics in the coming months and years. With the canals accommodating bigger vessels, bigger — or more efficient — terminals may then become a priority. For Buttimer Engineering, the challenge is to continue recent growth in Irish, UK and Polish markets while simultaneously becoming better equipped to serve customers in new markets — including a well-designed supply chain and sales network for its DOCKSOLID bulk port equipment. Combining

flexibility to access new opportunities, without compromising on the high quality, and bespoke nature of the engineering services delivered in domestic markets requires smart management and maintaining strong client relationships — a challenge Buttimer eagerly accepts!

From turnkey terminal design, to installation, commissioning and maintenance, or the supply of DOCKSOLID equipment, Buttimer Engineering's dry bulk handling credentials are tried and tested over more than 35 years. While the company streamlines its services, making them more accessible and effective for a broader client base, the commitment to 'fit-for-purpose' design principals and high quality engineering remains at the centre of Buttimer's business.







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# Moving along nicely...

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## New Cat® MH3037 wheeled material handler is ideal for port stockyards

The new Cat® MH3037 is the first in a series of the new wheeled material handler line that Caterpillar is introducing in the greater than 25-metric tonne size class. The new material handlers are purpose-built from the ground up to work productively and durably in industrial, scrap recycling, millyard and waterway and port applications, while affording maximum protection and convenience for the operator. The patented Cat ground-level-entry/exit design features a step-in cab that lowers to the front or the side of the machine to enhance convenience and safety for operators and service personnel.

The MH3037 has an operating weight of 39,500kg and is powered by a Cat C7.1 ACERT™ engine that meets US EPA Tier 4 Final/EU Stage IV emission standards. The engine features an electronically controlled, mechanically actuated, unit-injector fuel system that uses multiple-injection fuel delivery for optimum power and economy in all operating situations. The MH3037 configuration is rated at 225 horsepower (168kW).

High-strength structural steel and advanced welding techniques ensure structural integrity. A powerful hydraulic system provides rapid response with efficiency, and new serviceability features simplify maintenance. These design elements combine to provide low-cost operation and maximum value for MH3037 owners.

### STRUCTURES AND HYDRAULICS

Major structures use continuous welds that incorporate extensive chamfering and beveling to reduce stress

concentration. Booms and sticks are constructed from single-piece top and side plates to eliminate the need for seams and internal baffles. The upper frame is designed specifically to dissipate loads transferred through the front linkage and counterweight, and the lower frame has a unique tapered design for evenly distributing loads and reducing stress. Oversized pins and bushings strengthen pivot points. In addition, extensive finite element analysis and strain-gauge testing throughout the design process help ensure long term durability. Along with an 8.8m boom, the MH3037 can be equipped with a short 5.8m version or a longer 7.2m front configuration to best fit the application.

The MH3037 uses a closed-centre, one-pump, load-sensing implement hydraulic system with electro-hydraulic pilot control. The hydraulic pump generates only as much oil flow and pressure as required for the application, yielding powerful, rapid response and fuel-saving efficiency. To further enhance overall hydraulic power and efficiency, the machine regenerates boom-down oil flow, reducing the volume of oil the pump must produce.

Reflecting the precise hydraulic design, the MH3037 divides hydraulic functions between the upper and lower main control valves, with the upper valve managing the boom, stick, work tools, cab riser and cooling circuits, and the lower valve controlling travel, steering and outriggers. This design provides optimal flow management that allows multiple, simultaneous machine functions without compromising performance. An independent, closed-loop, hydraulic swing system maintains swing priority at all times.

The hydraulic oil cooler, engine air-to-air aftercooler (ATAAC), and engine radiator are all mounted side-by-side to reduce clogging caused by airborne debris and to provide better access for cleaning when necessary. The auto-reversing fan used in the hydraulic cooling system ensures that optimum temperatures between 54°C and 60°C are maintained, protecting oil quality, extending component life and promoting optimum machine performance.

The powertrain of the MH3037 incorporates limited-slip differentials on both the front and rear axles to provide true all-wheel-drive performance. A variable displacement hydraulic motor, coupled with a two-speed transmission, provides high- and low-speed travel and creeper-speed capability. An oscillating rear axle with an oscillation lock provides the capability to work on-rubber in rough, uneven terrain, maintaining stability without stabilizers deployed.

#### OPERATOR SAFETY AND CONVENIENCE

The hydraulic cab-riser system allows cab height to be adjusted up to an eye level of 5.5m. Raise time from ground level to maximum height is approximately 8 seconds; lowering time from maximum height to ground level is ten seconds. Adjustable sensors control the height of the cab above the ground, and manual override valves in the cab and at ground level allow the cab to be lowered in the event of engine power loss, ensuring that the operator can exit safely at ground level.

The MH3037 can be equipped with an optional impact-absorbing, falling-objects guarding system (FOGS). This includes a top guard to protect the operator from falling debris and a front guard to protect from flying debris in the work area. An adjustable, close-proximity stick limiter reduces the risk of work

#### MH3037 MATERIAL HANDLER SPECIFICATIONS

Engine model	Cat 7.1 ACERT
Rated power (ISO 9249, net)	168kW (225 hp)
Operating weight (without work tool)	39,500kg
Operating weight (with 4-tine orange peel grapple GSH425)	41,059kg
Hydraulic flow, main pump	
Hydraulic flow, swing pump	481 L/min
129 L/min	
System pressure	31,716kPa
Max. reach – horizontal (long front)	15.9m
Max. reach – vertical (long front)	17.7m
Max. travel speed	20km/h
Max. swing speed	7.6rpm
Max. swing torque	84kN m

tool contact with the cab, and load-holding valves on hydraulic cylinders prevent sudden uncontrolled drop of the boom, stick, cab, or stabilizers in the event of a failed hydraulic hose. The cab also includes a polycarbonate skylight, removable panels, and a rear window that serves as an emergency exit.

Images from the standard rearview camera are displayed via a high-definition colour monitor. A separate monitor displays operating parameters, starting fluid levels, machine warnings, and activated work functions. The system allows operators to set functions according to preference and provides maintenance reminders, diagnostic capabilities, and out-of-specification alerts.

Work functions are conveniently controlled with joysticks, as is steering control. Using joystick controls in lieu of a steering wheel enables operators to experience smoother, faster production and creates better sight lines to the work area.

#### SERVICEABILITY AND WORK TOOLS

Durable fiberglass gull-wing panels supported by gas-filled cylinders provide ready access to routine maintenance points in spacious, lighted compartments. Service panels are located on the top, left, and right side of the machine. Handrails and anti-slip surfaces help technicians perform their work safely and efficiently.

Greaseless bearings in the cab-riser linkage reduce maintenance, and an upper auto-lube system lubricates critical areas based on runtime. The machine is set at the factory to dispense grease every 15 minutes of machine use. The lower is manually lubricated from a central grease point located behind the lower control valve on the carbody frame.

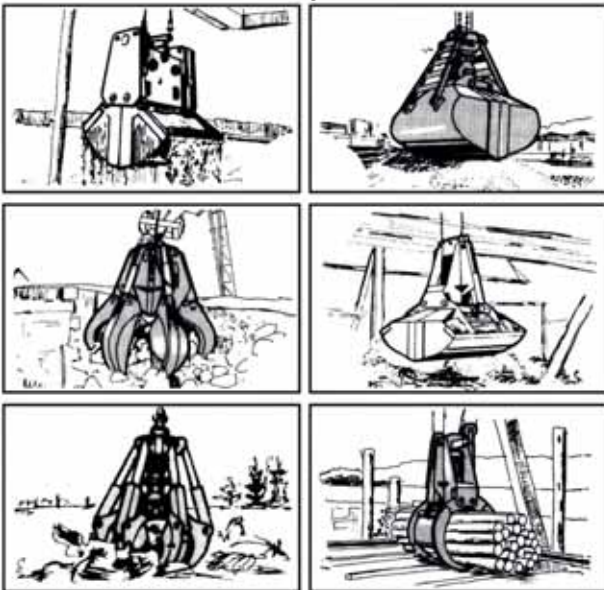
To assist customers in improving jobsite efficiency, lowering owning and operating costs and managing the MH3037 for optimum return on investment, Cat Connect offers LINK and DETECT technologies. Product Link™ allows fleet owners to wirelessly track machine location, hours, fuel consumption, idle time, events codes, and diagnostic codes via the online VisionLink® user interface. A rear vision camera greatly enhances job site visibility to help the operator work more productively.

The MH3037 can handle a variety of work tools. The machine features medium-pressure flow from a separate valve for tool rotation and a high-pressure circuit from the main pump to operate the open/close functions of typical tools, such as orange-peel grapples, clamshells, and log grapples. A separate pump is used to provide hydraulic power for operating an available scrap-magnet generator. The generator features a patented Cat solid-state magnet controller that eliminates typical maintenance issues and is supported and warranted through Cat dealers.

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## RDS Technology presents its LOADEX 100 scale



RDS Technology's LOADEX 100 is a retrofittable scale installed on both tracked and wheeled 360° excavators and material handling machines to weigh the amount of material in the bucket, grab or clamshell.

A minimum of two pressure sensors is installed into the hydraulic lift system.

The pressure signals are captured, filtered and corrected by measurements taken by an inclinometer. Slope corrections are made from another inclination sensor on the chassis.

When used dynamically, the pressures are captured through a set weighing zone. The system may also be used in static weighing mode; the boom can either be lifted to a set weighing position where the pressure is captured, or measuring constantly in a 'live' mode at any required boom height. Both dynamic and static weighing positions are adjustable by the operator to suit any job required, which will enable the machine to be used at its most efficient output.

Dipper arm position is established by a mechanical angle sensor mounted on the boom to dipper arm pivot. This provides fast and precise dipper arm angle measurement that is not affected by inertia G-forces or acceleration effects.

As an added option, oil temperature compensation can be provided by a clamp-on temperature sensor. Ultrasonic technology provides accurate bucket position compensation.

The final calculation is sent via CAN protocol to the LOADEX 100 cabin terminal. Load and store information is saved in the terminal where it can be distributed to an in-cab printer, modem or internal SD flash card.

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## ELECTRIFIED PERFORMANCE: FLEXIBILITY AND MOBILITY IN ACTION

Heavy crane lift specialists, Havator of Tornio, Finland, maintains a heavy booking schedule for one of its oldest, more versatile and most reliable cranes in its fleet, a 2001-vintage Terex® CC 2800 lattice boom crawler crane. Often the 600-tonne (660-US ton) crane moves from job to job, never receiving a reprieve at the lifting company's home office.

Last lifting season is a prime example of just how much business Havator books for the CC 2800 crane. Over a relatively short period of time, the company moved the versatile Terex crane three times, logging over 350km (217mi), for three very different applications.

Havator first used the crawler crane in an industrial application, changing 62-tonne (68-US ton) process washers at a paper mill in Pietarsaari, Finland. Crew members then loaded the crane on 15 trailers, plus three heavy haulers for the crane superstructure and crawlers, and led the convoy 250km (155mi) north over a three-day journey to Oulu for changing electric plant filters at the Toppila Power Station. The third leg of the trip saw the crane moving another 100km (62mi) north by land and then barged to an island for a windmill project to switch out turbine gears.

"The CC 2800 crane is fast to assemble and disassemble, quite easy to transport and flexible enough to be used on many different projects," says Logistics Manager for Havator, Matti Simola. "We use it for industrial and windmill projects, but the lumber industry is where we use it most. This is just one of 60 Terex cranes we have in our fleet," he continues.

## LOW LOAD & CONFINED

By far the most challenging of the three projects was the power station job. The four, 20m (65.6ft) tall, 20-year-old filters offered some excitement for Havator's lifting crew and the CC 2800 crane. "The new filters weigh approximately 200 tonnes (220 US tons) each," explains Simola, "but the weight and condition of the old filters can be a bit of a mystery."

One of the largest peat-fired power stations in the world, the Toppila Power Station generates 210MW of electric power and 340MW of thermal power. The four massive air filters pull from the airstream the particulate matter generated by the peat-burning process. The filters are changed on a 20-year cycle. "The filters are typically covered with dust, rust and other items, which can increase the filters' weight," comments Simola.

The 600-tonne (660-US-ton)-capacity Terex crane was up to the challenge posed by the unknown. Havator configured the crane with its heavy boom segments, constructed the 42m (138ft)-long main boom and added a 30m (98ft) luffing jib to reach the required 65m (213ft) hook height for filter removal.

To help boost the crane's lift capacities, Havator's crew added 160 tonnes (176 US tons) of counterweight to the main body of the CC 2800 crawler crane and another 275 tonnes (303 US tons) onto the variable-radius Superlift tray. "We used the Terex Superlift wagon with wheels, which allows the tray to smoothly move back and forth as the crane works," says Simola. "This helps to boost lift capacities as well as efficiencies."

Since space was at a premium at the electric plant site, Havator chose the short boom/jib configuration and worked at a relatively narrow radius, ranging from 24m to 27m (79ft to 89ft).



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MATERIALS™**



“At the minimum radius in this configuration, the CC 2800 crane offers a lift capacity of up to 227 tonnes (250 US tons) and 205.5-tonne (226.5-US ton) capacity at the maximum working radius, so we built in extra lift capacity to account for the possibility of additional weight with the used filters,” adds Simola.

Once on site, Havator’s rigging crew took just 2.5 days to set up the crane. This included additional steps required to meet the strict 15t/m<sup>2</sup> (1.5 US ton/ft<sup>2</sup>) ground load pressure limit. Even though the crane’s weight is spread over its large crawler tracks’ 31m<sup>2</sup> (332ft<sup>2</sup>) area, the CC 2800 crane could not reach the relatively low load limit for the job.

“We had to strictly adhere to the ground load pressure limit, because of the risk of damaging the many pipes and canals running under the ground,” explains Simola. “We placed multiple special kinds of pontoon plates under the lifting/driving area. They are approximately 6.5m long by 3.5m wide by 0.6m thick (21.3 x 11.5 x 2.0ft).” For contractors that often face applications with low ground load pressure restrictions, Terex offers 1.8m (4.9ft)-wide crawler tracks, so weight can be disbursed over a wider area.

Over the next week and a half, Havator’s two crane operators, supervisor and radioman used the Terex CC 2800 crawler crane to perform the eight major picks — four to remove the old filters and four to install the new — and several minor lifts. “We had to carry the load of the old filters over a distance, so it was necessary to use the crawler crane,” says Simola. The used filters were placed on a special Havator trailer that carried them over to the assigned storage location, approximately 300m (984ft) from the lift area.

The CC 2800 crane performed flawlessly removing and replacing the 20m-long by 10m-deep by 20m-high (65.6 x 32.8 x 65.6ft) filters. “Everything went well,” says Simola. “We worked according to plan and completed the job on time.” Then the crews quickly dismantled the crane, loaded it back onto the 15 trailers and three heavy trailers, and moved it to Kemi for the windmill project.

After the Kemi windmill project and an extended period away from the office, the CC 2800 crane made its way back to Havator’s Torino yard for a scheduled inspection. “We had Clemens Marx (Field Technician for Terex Cranes) visit our office



to conduct a thorough, ten-year inspection of our CC 2800 crane,” mentions Simola. “Based on his findings, we renovated the winches, boom sections, engine, sheaves, bearings and pendants, and it’s now operating like a new crane.”



#### ABOUT HAVATOR

A company dedicated to crane services, special transport, section assembly and harbor crane services, Havator’s operations reach the Finland, Sweden, Norway, Russian and Baltic States market areas. Started in 1947 as a family business in Tornio, Finland, Havator has grown throughout the decades into a multinational corporation with more than 600 employees and group sales of over € 100 million.

#### ABOUT TEREX

Terex Corporation is a lifting and material handling solutions company reporting in five business segments: Aerial Work Platforms, Construction, Cranes, Material Handling & Port Solutions and Materials Processing. Terex manufactures a broad range of equipment serving customers in various industries, including the construction, infrastructure, manufacturing, shipping, transportation, refining, energy, utility, quarrying and mining industries. Terex offers financial products and services to assist in the acquisition of Terex equipment through Terex Financial Services. Terex uses its website and Facebook page to make information available to its investors and the market.



# Peak level of performance



The power of advanced technology has developed a new high-quality range of Hitachi construction machinery. ZW-5 wheel loaders offer a peak level of performance, reinforcing their leading reputation for reliability and durability. Designed for the most challenging material handling environments in ports and harbours, the Hitachi ZW180-5 delivers increased productivity at a lower cost of ownership.

## HITACHI

Reliable solutions



## Hitachi's ZW550-5 proves its fuel efficiency for Lasa Marmo

The largest wheel loader in the Hitachi range has been delivered to Lasa Marmo's Whitewater marble quarry near the village of Laas in northern Italy. The new ZW550-5's main function is to lift each marble block that has been extracted from the cavernous site — situated 1,600m above sea level — and transport it through a series of passageways to an outdoor storage area.

The ZW550-5 was delivered in December 2014 by Comac, a sub-dealer of the Italian Hitachi dealer for construction machinery, SCAI SpA. The fuel consumption is described as 'brilliant' — on average eight litres per hour better than the previous machine — by Erich Tscholl, Lasa Marmo's Operations Manager. It was supplied with a bucket and fork attachment, which is utilized through 80% of the machine's operations.

Lasa Marmo's decision-making process for the purchase of the wheel loader was made by comparing three machines across five important criteria: the purchase price; after-sales service; performance and lifting power; agility and



“It is really amazing, especially with the hydraulic system and its lifting capacity. I've not yet had the need to push the machine, but so far it doesn't flinch when lifting even the heaviest loads. In

fact, it can lift anything on minimum throttle and there is also no difficulty in moving the blocks through narrow spaces or up the steep slopes in the cave. The automatic gearshift is incredible and could be one of the main reasons for the low fuel consumption.”

Whitewater quarry is the area's main source of the 400 million-year-old metamorphic rock — an exceptionally hard and durable material, which is resistant to harsh and adverse weather conditions. With an estimated 30 million cubic metres of marble remaining to be quarried over the next 500 years, it is one of the largest natural resources of its kind on the planet.

Lasa Marmo currently has a 30-year lease for Whitewater and two other historic quarries up until 2033. Between 2,000 and 4,500m<sup>3</sup> of marble are quarried each year, and the company places a strong emphasis on processing the raw materials in Laas. This helps it to contribute to local industry and the region's artistic traditions, as well as work as a partner with the local authorities for the protection of the area's natural beauty.



manoeuvrability; and size of the machine.

Tscholl summarizes their conclusions: “The Hitachi's hydraulics were better and the traction power was stronger — even when travelling up the steepest hill. We spoke to the operator of the previous ZW550 model and carried out some tests with the machine, such as travelling fully loaded uphill. Overall, the Hitachi performed better than the other two brands.

“The height and width of the machine were among the most important parts of the required specification. The DPF filter is another essential feature — with less emissions and noise in such a confined space, we were aiming for a better and safer working environment within the site.”

Operator Roland Spechtenhauser has found the machine to be incredibly user-friendly: “It was easy to learn how to operate the ZW550-5 and it already felt like it was part of me after only a few days. The sensitivity of the levers is one of the machine's strengths — it does exactly what you want it to do, even to the nearest centimetre.



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## Portalink and Portaload: jewels in the crown of Buhler's mobile portfolio

*Two 1,000tph Portaload shiploaders in operation in China.*



Buhler specializes in solutions for grain terminals, being it loading or unloading, writes Vincent Van der Wijk, Product Manager Ship loading and unloading equipment.

In the field of continuous unloaders and unloaders, Buhler manufactures both mechanical and pneumatic unloaders. Its popular Portalink and Portaload models are available as both stationary and mobile units.

The mobile Portalink is the mechanical unloader for sea going ships up of to 125,000dwt. It has an unloading capacity from 300tph (tonnes per hour) to 1,300tph, and boasts top-of-the-class operating costs through low energy usage, low maintenance, and easy operating use.

Buhler's loading equipment is based on the same two loading principles, and offers capacities ranging from 800tph to 3,000tph. The company's stationary Portaload is based on three to four loading towers which are trimmed for maximum performance and designed for continuous loading. The mobile Portaload is completely revised to eliminate any hydraulics, minimal energy usage, low stress on the quay, and easy operating use.

Buhler's mobile equipment handles all free flowing food products and mealy products like soya meal. Its mechanical loaders and unloaders can efficiently handle the delicate product characteristics of the products and have a clear customer advantage regarding lower operating costs and increased efficiency due to the easy and auto sink-in and lower-out function. Buhler is maintaining a leading role in the marketplace by actively adapting the product portfolios and setting new standards by introducing new technology.

A prime example is Buhler's mechanical ship unloaders. At an

early stage, Buhler identified that vertical mechanical conveying, when compared to pneumatic conveying for example, is not only very efficient but has also significantly reduced product breakage through gentle product handling. In addition, the company's machines means that it is possible to handle and process grains economically, adding a further dimension.

Through its world-wide network of experts, Buhler solves its customers' problems with the greatest care and with specific attention to each problem.

### CLIENT BASE

Major clients of Buhler for mobile harbour equipment are naturally the large trading and exporting facilities demanding reliable, high capacity, efficient loading and unloading equipment having low operating costs, but also direct end-users such as millers, brewers, feed plants, etc. are trusted and important customers for Buhler.

### CONSTANT INNOVATION

In order to remain competitive in the marketplace, Buhler is always looking for new developments and product improvements, and constantly tries out new materials.

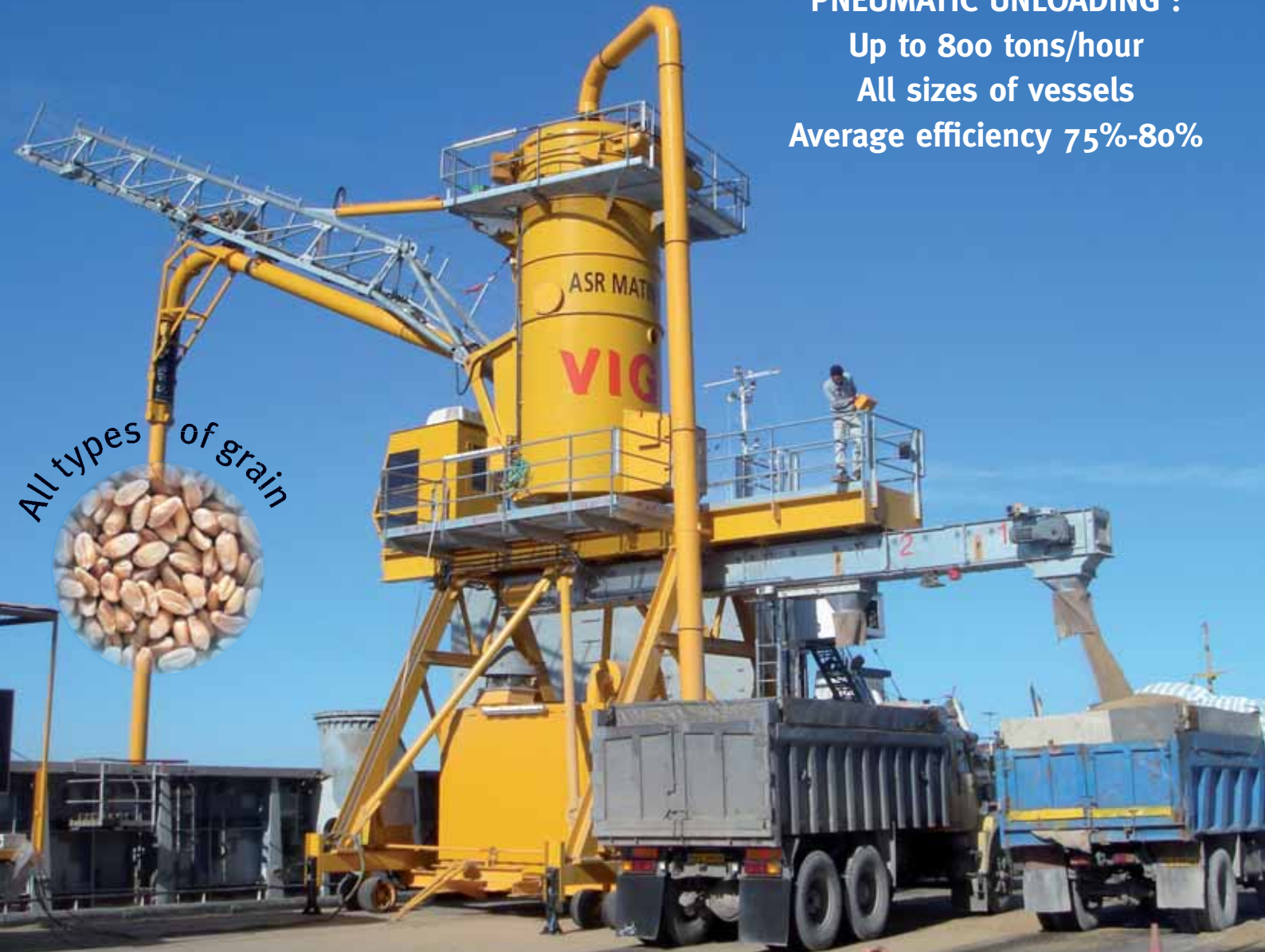
The company's latest development is the complete revision of the mobile loader, combining market and customer feedback and internal expert knowledge. The new mobile loader has been designed focused on the main functions of loading product as efficiently as possible, and ease of use during operations.

With this in mind, Buhler has created the Mobile Portaload, which has no hydraulics, removing complex equipment where



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possible, increasing the ease of operating. The direct result of less complexity and fewer parts means is higher availability!

Another benefit is the low weight and power usage of the Mobile Portaload. The low power consumption is setting a new standard in the market, where the lower weight reduces the requirements of current pier installations.

#### RECENT CONTRACTS

- ❖ Buhler has received the order to upgrade an existing loading plant in North America with a new boom with a nominal capacity of 1,600tph and capable of handling Panamax II vessels; and
- ❖ two large Portalinks with a nominal capacity of 1,200tph and capable of handling Panamax II-class vessels.



#### NOTABLE TECHNOLOGICAL DEVELOPMENTS

Combined with the revision of the mobile loader, the operating system has fully been upgraded to the latest market standard. The latest operating system has increasing functionalities such as a touch panel directly presenting error messages, individual selection of each motor and sensor, saving precious time during loading and unloading.

A detailed picture of the installation integrated in the software where the individual sensors are situated makes it even easier to identify and optimize the operating efficiency.

#### BUHLER — COMMITTED TO SUSTAINABILITY,

Every day, billions of people use Buhler technologies to satisfy their basic needs for food, mobility, or communication. With its industrial process technologies and solutions, Buhler makes a significant contribution to feeding the world's population while

focusing on food safety and security. Around 65% of the wheat harvested worldwide is processed into flour on Buhler mills. The company's contribution to the global production and processing of rice, pasta, chocolate, and breakfast cereals is equally substantial.

Furthermore, Buhler is a leading solution provider of die casting, wet grinding, and surface coating technologies, with a focus on applications in the automotive, optics, electronics, printing, packaging and glass technologies. The solutions provided to these industries are characterized by high energy efficiency and sustainable mobility. As a leading technology group, Buhler invests up to 5% of its turnover in research and development every year. Buhler is proud of its Swiss roots, with 10,600 employees at some 140 sites generating sales of CHF 2.3 billion. As a family-owned company, Buhler feels particularly committed to sustainability.

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# Cleanliness?

it's next to godliness  
dust control systems for  
the bulk industry

Jay Venter

## Install a Freedom<sup>®</sup>: Dust is done

Particulate matter, fines, powder, sift, drift and dredge. All are ingredients of 'fugitive' dust — that notorious environmental enemy faced by the dry bulk sector, writes *Melanie Saxton, Geometrica*.

It's more than a nuisance. Some stockyard operators lose valuable open air inventories when the wind kicks up. Worse, nearly every manufacturing process injects clouds of fugitive dust into the atmosphere. Wind spreads stockpile particulates, dust from transport and unloading, as well as material spillage at conveyor transfer points. All permeate surrounding ecosystems... and therein lies the problem.

### SCRAMBLING FOR COVER

The fact is, windblown dust 'is' air pollution. It's only a matter of time before the enclosure of stockpiles is no longer 'optional', as

governments have begun regulating air quality and implementing other environmental initiatives. But as manufacturers seek ways to protect their piles from wind — and the landscape from dust — they have been faced with the constraints of conventional building systems.

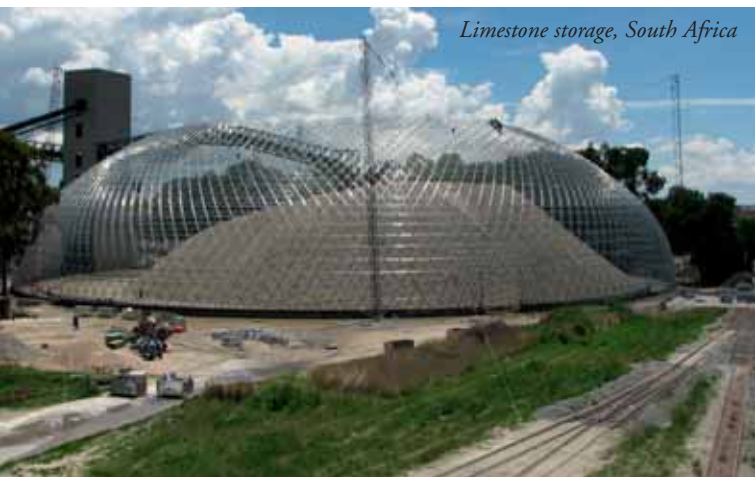
Traditional structures are expensive, unwieldy and often fall short of the design requirements for mountainside slopes, irregular piles and corrosive environments. So how do cement, power generation, fertilizer and mining manufacturers clear the air of fugitive dust and operate their businesses responsibly?

### FREEDOMES<sup>®</sup> TO THE RESCUE

The solution to dust is a dome... but not just any dome will do. Geometrica's Freedom<sup>®</sup> technology is the next generation in long span design and provides flexible, customized storage solutions regardless of climate or terrain. In fact, 'all-terrain' is a hallmark of these efficient domes that can cover highly irregular stockpiles up to 300m. These planet-friendly structures tame windblown dust emissions regardless of atmospheric turbulence, while improving workflow and production.

For instance, quayside dry bulk operators need corrosion resistant covers that stand up to typhoon-force winds and salt water. Fertilizer plants seek to suppress caustic drift with enclosures that withstand corrosive stockpiles inside and out. Other hazardous stockpiles, such as coal, produce combustible dust — an issue solved through Geometrica's internal cladding. Freedomes — Geometrica's freestyle domes — also protect sensitive desert habitats from the spread of uncontrolled fines. Likewise, raw materials located on high altitude mountains require an all-terrain solution to accommodate brutal wind loads and rugged slopes.

Limestone storage, South Africa





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*Pupuk Kaltim Dome, 81m  
Coal boiler plant, Pupuk Kaltim, Bontang, Kalimantan  
Timur, Indonesia*



#### **DUST-BUSTING: A CHECKLIST**

Manufacturers must insist on value and versatility when considering a dust-defying, eco-friendly dome. The following questions should be asked and answered:

- ❖ can the dome be built over existing open air stockpiles with no downtime or loss of operations?
- ❖ are there competitive initial and lifetime costs?
- ❖ can the dome span enormous lengths?
- ❖ are there internal and external cladding options based on the composition of the stockpile?
- ❖ can the dome be designed in a variety of shapes to enclose sprawling, irregular stockyards?
- ❖ will the dome withstand typhoon-force winds, brutal snow loads, punishing slopes and salt water environments?
- ❖ can it be built from the perimeter up?
- ❖ does infrastructure include dimensional and loading requirements for the stockpile cover?
- ❖ can the dome and stacker/reclaimer equipment be installed simultaneously, as well as openings for incoming conveyor and entrances for off-road vehicles?
- ❖ will there be space for a traffic lane inside the dome, for instance, around the ring rail of the reclaimer?

- ❖ will the dome be constructed of corrosion-resistant materials that provide maintenance-free use?

Geometrica builds domes that meet all the challenges above with proprietary software that controls design, fabrication, packaging and installation. No scaffolding, welding or operating downtime is necessary. No secondary structure is required for cladding. Local labour can install the dome over a light foundation. Structures are bar coded, containerized in convenient two ton crates, and delivered anywhere in the world.

#### **TECHNOLOGY IN ACTION**

For industries involved in mining and mineral processing, a Freedom suppresses dust emissions from excavation, ore handling and crushing. For sand and gravel rock crushing, the dome eliminates dust as raw materials are received, transferred into storage and loaded into mixing hoppers. For coal and fertilizer storage, Geometrica's internal cladding helps prevent ignitable and caustic dust from migrating the plant and infiltrating surrounding communities — a benefit to the power generation industry, as well.



*Coal storage, Taiwan*



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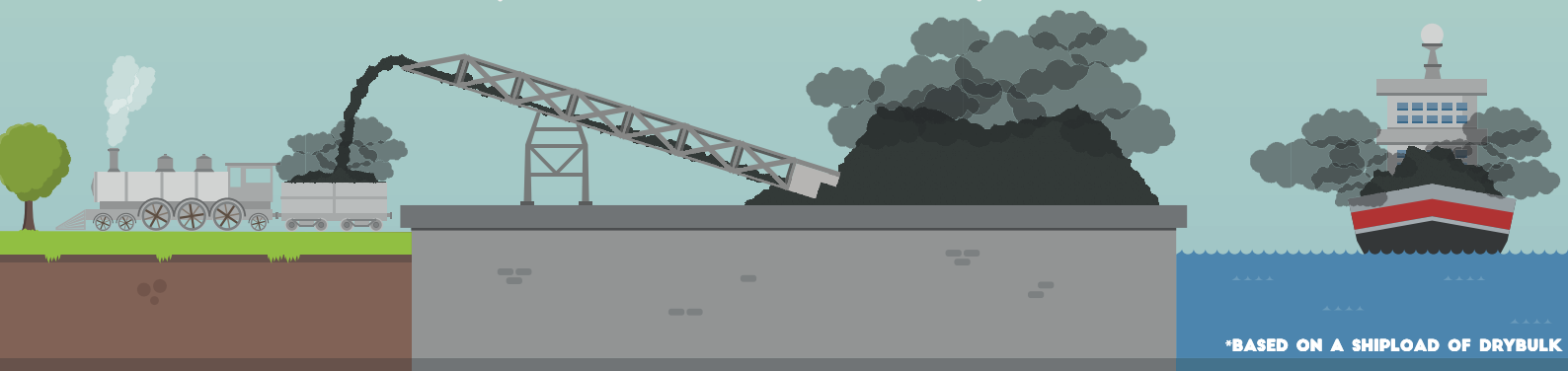
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*Belt conveying systems enable rapid and efficient transport of bulk material from the quarry to the destination as well as through rough terrain while simultaneously protecting the environment from falling material.*



## BEUMER provides plants and systems for the transport, loading and filling of bulk material – with significantly less dust formation

### ALMOST NO LOST PRODUCT

Bulk material like building materials, coal, cereals, fodder or mineral compounds are often transported via motorways, railways, waterways or through nature reserves. The large quantities of dust generated during this process can pollute the environment considerably. Dust clouds can also occur during loading, filling and palletizing. This not only creates considerable clean-up for the employees, but chemical industry products can also present a health hazard and cause dangerous reactions. With its conveying, loading, filling and palletizing systems, BEUMER Group ensures minimal dust emissions.

BEUMER Group is a leading systems provider for transporting, loading, filling and packaging bulk material. The BEUMER portfolio includes curved belt conveyors for fast and cost-efficient transport of large quantities of bulk material from the quarry or mine to the factory or port. The belt conveyors are able to navigate long distances, high angles of inclination and tight curve radii, and can be adapted individually to the belt or pipe conveyor bulk handling solutions. Depending on the customer's requirements, BEUMER provides either troughed belt or pipe conveyor bulk handling solutions. Open troughed belt conveyors are recommended for larger throughputs, higher mass flows and wider curved radii. Closed pipe conveyors protect both transported items from environmental influences and the environment from falling items. Troughed belt conveyors can also be covered or encased to minimize dust formation during transport. This seal guarantees dust-free transport.

BEUMER's portfolio also includes mechanical vertical conveyors such as belt bucket elevators. They are an essential production link in the cement industry. BEUMER reliably seals the shaft casings of these bucket elevators, which stops dust from escaping. Instead, the dust trickles into the bucket elevator boot that is equipped with a dynamic bottom. Wet and sticky material cannot accumulate but is fed back into the transport process.

### LOADING WITHOUT SPILLING

BEUMER Group has developed bulk loading heads for the quick and dust-free loading of bulk transporter vehicles. They are designed according to the double-wall system, where the material inlet and the dedusting unit are separated from each other. When the bulk loading head is placed on a filler neck, its sealing cone is lowered and the outlet spout opens simultaneously. The lowering level of the sealing cone is variable. You can adjust the fill level in the vehicle using the fill level meter. In order to balance out any minor positional deviations of the vehicle, the operator can move the bulk loading head laterally during placement.

The bulk loading head is also available with an integrated compressed-air filter. This allows you to operate the centralized dedusting units independently from the dust transporting devices. The dust removed from the bulk transporter vehicle is fed again to the material flow during loading. The compressed-air filter consists of filter hoses which are positioned between the inner telescopic tube and the outer bellows. The suction is carried out by a fan fastened at the outside. The cleaning is carried out by timed compressed-air shocks.

### DUST-FREE LOADING OF OPEN VEHICLES

BEUMER offers various types of telescopic loading systems for dust-free loading of open vehicles. With these systems, the bulk loading head is lowered to the floor of the vehicle and the material feed is switched on. A fill level switch in the lower dedusting hood is activated by the rising material. This causes the bulk loading head to be raised automatically. The edge of the dedusting hood always rests on the material cone while it rises, so that no dust can escape. The bellows, or the telescopic tubes for the dust extraction, are connected to a central dedusting air system. Corresponding devices or flow control gates transport the material to the system. The bulk loading heads can also be equipped with fill level indicators. Once the vehicle is loaded,

*With the BEUMER bulk loading head, bulk transporter vehicles can be loaded quickly and without dust.*  
 Photos: BEUMER Group GmbH & Co.



they reliably turn off the material feed. Different types of fill level indicators are used depending on the properties of the material. Some of the criteria used to select the correct switch are bulk density, flow behaviour as well as product temperature.

#### MOBILE LOADERS FOR BULK TRANSPORTER VEHICLES

In the cement industry, high loading capacities are required. Stationary bulk loading heads are often not sufficient, especially if the bulk transporter vehicle is standing on a weighbridge and may not be moved during the loading process. It should be possible for the operator to move the bulk loading head to each filler neck of the vehicle. Depending on the properties of the materials to be loaded and the length of the vehicle, different sliding or swivelling loading system options are available. These mobile loading systems can be fitted with either one or two loading heads, depending on the space available.

First, the bulk material needs to be filled in bags so that it can be palletized, packaged and sent to the customer. As a single-source provider, BEUMER Group offers an innovative solution with the BEUMER fillpac filling machine and provides equipment and systems for packaging lines. The new machine can be flexibly

*Picture 4: The twin-belt turning device: Two parallel belt conveyors, driven with different speeds during the turning process, bring the bags gently into the required position.*



*Picture 3: Equipped with extensive features, BEUMER Group has added the rotating filling machine, BEUMER fillpac, to its product portfolio.*



integrated with existing packaging lines and can be optimally adapted to the customer's situation. What makes the BEUMER fillpac unique is a specific weighing electronics which ensures the weight accuracy of the bags. Rejects caused by too high or too low filling weights can nearly be eliminated. The weighing unit communicates permanently with the filler neck via a specific software. The automatic bag weight adjustment determines the exact filling weight of the bags, thus enabling the exact degrees of filling during the filling process. The filling spout is equipped with a special hood that reduces dust emission to a minimum. There are also suction points on both sides in the area of the filling spout. The dust is sucked off directly where it builds up and fed back into the process. This allows for a practically dust-free filling of the bags. The three-position cylinder that regulates the coarse and fine flow is protected from dust, because it is positioned vertically and outside of the dirty area. The cylinder for bag discharging is also located in the dust-free zone above the filling spout.

The paper, PE or PP bags are then stacked on pallets of different sizes in a flexible, precise and stable way. For this, BEUMER has developed the BEUMER paletpac, a high capacity layer palletizer. If you want to avoid dust formation, the bags have to be handled very carefully. This is why BEUMER offers the palletizer with a clamp-type turning device or the newly developed twin-belt turning device. They position the filled bags quickly, ensuring their dimensional stability without any deformations. If required, BEUMER Group customer support can simply upgrade existing palletizers with the twin-belt turning device.

BEUMER Group is an international manufacturing leader in intralogistics in the fields of conveying, loading, palletizing, packaging, sortation and distribution technology. Together with Crisplant a/s and Enexco Teknologies India Limited, the BEUMER Group employed some 4,000 people in 2014. The group generated an annual turnover of approximately €680 million. With its subsidiaries and sales agencies, BEUMER Group is present in many industries worldwide.



## SWAP & save: new frontier for cleaning of long bags

### INTRODUCTION

This article deals with the recently commissioned plants worldwide for gas dedusting and outlines the functioning principle and the advantages coming from the CTP Team bag cleaning technology at low pressure and its new advanced developments, writes Roberto Binago, Sales & Projects Director CTP Team Srl, Bedeschi Group.

It focuses on the recently completed projects featuring long bag cleaning technique for different cement applications. In all projects the bag filters implement the SWAP technology (Sonic Wave Acceleration Pulse) for bag cleaning, performing enhanced efficiency and increased lifetime of bags with minimum energy consumption thanks to a unique implementation of high performance components. For these filters, the special design of the low pressure cleaning system operating in on-line mode, is able to restore up to more than 110m<sup>2</sup> of filtering area at a time with one single shot lasting few milliseconds.

These projects prove that CTP Team is a reliable partner for gas dedusting equipment installation and emission control.

### SWAP BAG CLEANING SYSTEM TECHNOLOGY

The SWAP (Sonic Wave Acceleration Pulse) technology developed by CTP Team is a unique bag cleaning system working at low air pressure, designed to remove dust from several bags of extended length at the same time, with one single shot of compressed air at best efficiency and minimum stress of the filtering elements. In comparison with the traditional high pressure bag cleaning method, with SWAP technology the bag is no more blown with both primary air (from the tank) and the addition of much more secondary air (from filter plenum) thanks to the Venturi effect.

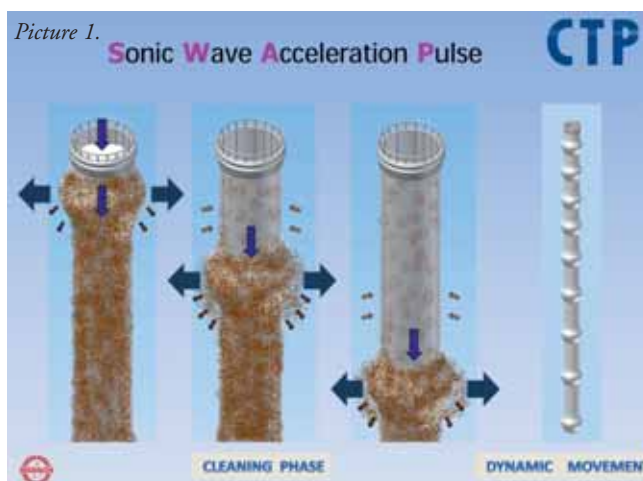
With a special design of powerful piston type valves, rather than the more traditional membrane type ones, installed directly onto the pulse header tank, the very high speed and fast response of the valve and the elimination of Venturi, normally located at the mouth of the bag, create a short and very fast pulse acting as a wave starting from bag top line and travelling down to the bottom at sonic velocity with the same profile and efficiency regardless of its length.

The innovation, in comparison with traditional systems, is related to a much shorter valve opening time (40ms vs. 100ms) and reduced inertia of the valve elements which lead to significant improvements in terms of cleaning efficiency, energy consumption and long-term reliability thanks to a lower compressed air pressure (2.5 bar vs. 6 bar) but enhanced pressure induced inside the bag up to the very bottom area.

The final result is a shape of the pulse which is such that the required acceleration of the filter fabric are achieved over a much greater length and of filter bags than with any other cleaning system available today in the market. Besides, a highly reduced consumption of compressed air required from the compressor is capable to clean an increased quantity of long bags at the same time, extending even more the expected lifetime due to the reduced stress of the filtering medium.

The principle of the SWAP cleaning technique is shown in Picture 1.

SWAP technology is a well proven bag cleaning system: up to now 39 plants have been commissioned whilst other 14 projects are under erection or during the engineering phase for a total number of 53 projects in different countries. Some of the latest realizations are described hereinafter.



### LATEST SWAP APPLICATIONS WITH LONG FILTER BAGS

Çimentas Çimento, one of the major cement producers in Turkey belonging to the Italian Group Cementir Holding, decided to comply with the latest regulations for dust emission at its factories located in the Elaziğ and Kars.

The gas process line for kiln & raw mill dedusting was originally designed with ESP units for both plants. The scope of this project was to reuse the existing facilities as much as possible and to convert the ESPs into a state-of-the-art bag filter to enable the best filtration efficiency.

In case of upgrade of existing lines and particularly during the design of old precipitators conversion into bag filters, the installation of long bags increases the flexibility to reuse the existing structures and make possible to maximize the capacity of the modified unit once in operation keeping the existing footprint.

The upgraded dedusting lines have been both designed by CTP Team with the following main features:

- ❖ reuse of some of the existing ESP components such as hoppers, casing, inlet/outlet hoods and dust discharge system;
- ❖ supply of new filter components, ie, bag cleaning and filtering sets, clean gas plenum and top penthouse for weather protection complete with maintenance hoists;
- ❖ PLC for filter control;
- ❖ fresh air dilution damper for bag protection against temperature peaks;
- ❖ new compressed air station;
- ❖ modification of gas outlet duct; and
- ❖ new ID filter fan, motor and drive for clean gas delivery to the existing stack.

As for any conversion from an existing precipitator into bag filter, the internal gas distribution towards the electrodes and plates is completely different from the approach used in filter bag technology. Therefore, an intensive CFD modelling study is always mandatory and is usually performed during the engineering phase before proceeding with manufacturing of new parts as well as for any modification of existing ones.

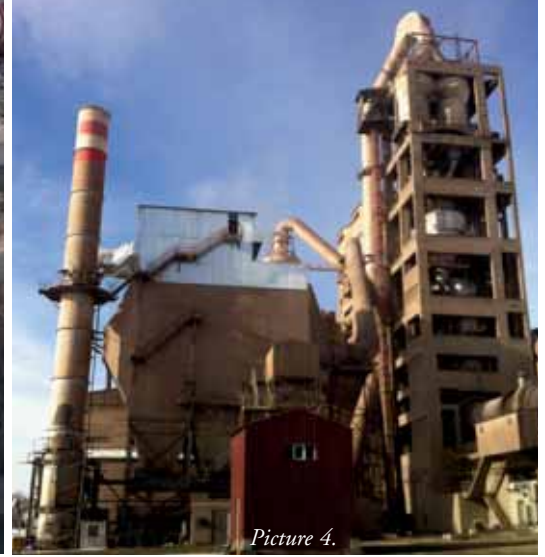
In Elaziğ plant (Picture 2 and 3), in order to fit the necessary filtration area within the original ESP size maximizing the filtration capacity, the unit was designed with 10m-long bags and equipped with the SWAP cleaning system which gives a very high-performance at low air pressure, for a simultaneous cleaning of 24 bags on a single row. As a result, in this bag house each row of bags means 115m<sup>2</sup> of filtration area cleaned at the same time by means of one single shot of compressed air at low



Picture 2.



Picture 3.



Picture 4.

pressure lasting just few milliseconds.

After one year operation, the performance of this filter is well over any expectations in terms of efficiency and energy consumption.

For Çimentas Çimento a similar job was executed for the kiln/raw mill line in Kars plant, where the retrofit of the ESP was also designed for bag length of 10m and 21 bags each row; in this case the bag filter is able to restore 100m<sup>2</sup> of filtering area at a time with one low pressure shot of air (Picture 4).

Besides, the cleaning of many long bags at a time with one valve, the low operating pressure and the very short opening-closing time of the piston valve, drastically reduce the overall energy consumption of the installation.

The powerful SWAP technology is even more impressive keeping in mind that is able to operate with the simple online cleaning method. This means there is no need to implement any multiple-cell design to isolate the filter section during the cleaning cycle with consequent mechanical simplification, minimum maintenance and maximum reliability of the system.

The same positive results have been obtained by CTP with the SWAP system applied in cement grinding dedusting.

The Indonesian Bosowa group is running a 250tph VRM together with CTP bag house in its cement factory located in Maros (Picture 5). The SWAP system is performing at top efficiency in bag cleaning even when it is necessary to detach thousands of tonnes per day of dust from long filtering bags.

The new filtration unit has been designed with 8m long bags and 20 bags per row (83m<sup>2</sup>). It has been operating for one-and-a-half years and was designed to perform both online and offline cleaning methods. With online cleaning, the negligible fluctuations of pressure drop in comparison with offline mode is particularly appreciated as grant very high stability of the mill ensuring the best quality of the final product.

Picture 6 shows the trend of

SWAP capability in cleaning a continuously increased filtration area during the past 30 years. In this picture, each point represents a cumulative number of plants designed by CTP with bags from 3m up to 10m long. While over the years the reference bag length has progressively increased more than 300%, CTP has also increased the cleaned area per single shot by over 600%, thanks to the SWAP technology.

New bag filters for cement, kiln bypass, coal and raw mills will be commissioned in the next few months with SWAP system and bag length up to 10m in Vietnam, Egypt, Turkey, Korea, Saudi Arabia and Indonesia.

**CONCLUSION**

The SWAP technology developed by the CTP Team is a unique bag cleaning system at low air pressure, designed to remove dust from several bags of extended length at the same time, with one

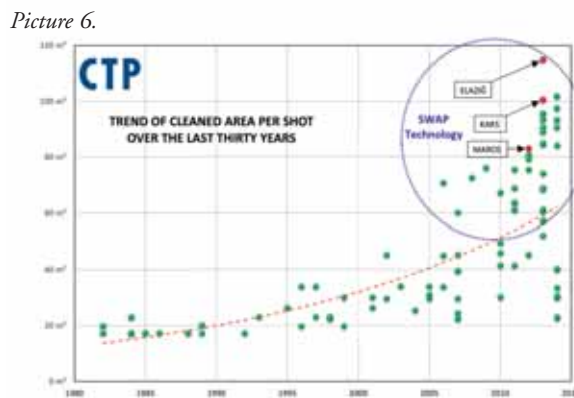
single shot of compressed air, with optimum efficiency and minimum stress to the filtering element. The target of more than 100m<sup>2</sup> of filtering area cleaned in one single row has already been overcome with excellent results.

The good performance of many projects successfully commissioned by CTP, confirms this positive trend and more and more users are updating their guidelines concerning the application of longer bags opening a new scenario for the design of baghouses for cement applications where dust loads of the gas to be filtered are extremely severe and plants must comply with the latest regulations in terms of emissions.

The cleaning of increased number of bags with extended length up to 14m is now under testing and even more compact filters' size shall be in operation in the near future equipped with SWAP technology.



Picture 5.



Picture 6.



## Loading bulk solids with explosive characteristics



*Cimbría Moduflex loading chutes with fully integrated self-contained filter system.*

Cimbría Bulk Equipment has serviced the dry bulk industry for decades, focusing on the loading and conveying of all kinds of industrial bulk goods. The company has thereby gained a vast experience within industrial bulk handling. This experience is constantly being put to use in developing new solutions which meet the demands of authorities and users for functionality, quality and environment friendly operation. The solutions have been developed on the basis of a product range consisting of various types of loading chutes for open and closed loading of dry bulk materials into e.g. trucks, rail wagons, containers, ships and for stockpiling. The loading chutes are sold under the brand name Moduflex.

The company has an experienced, highly qualified workforce, its own development and construction department and modern production facilities which enable it to construct and manufacture all of the solutions in accordance with the individual requirements of each client. The loading chutes can be designed to solve all kinds of loading tasks and manufactured either as straightforward single equipment or complete systems for large corporate projects.

However, Cimbría Bulk Equipment is not only recognized as a dependable supplier of various transport equipment, the company has also managed to distinguish themselves by being acknowledged problem solvers with the ability to create innovative solutions where particular customer requirements are taken into account.

Membership of the Cimbría Group of Companies means that Cimbría Bulk Equipment can draw on the expertise of the other group members and provide complete solutions for the clients.

### HANDLING EXPLOSIVE PRODUCTS

Dust is an important issue when handling various bulk solids such as e.g. grain, paper, plastics, sugar, wood or other organic material, as it is the cause of many accidents in the work place.

This is not only because of the dangerous effects on the human body working in a dust laden area can have, but more because the storing and handling of these products always contains a high explosion risk that might cause destruction of buildings and production equipment and in worse case — loss of human life. However, recent years increased focus on dust emission with the implementation of the ATEX directive has proven to have a preventative effect.

The correct design of transport equipment with regards to limiting the dust emissions is particularly important. The demands for explosion proof equipment imply that all supplied mechanical parts and electrical components are special constructed for application in equipment installed in high explosive risk areas. All precautions taken endeavour to create a safe working environment. Beyond the direct improvement of the working environment by bringing down the amount of



*The loading chute is equipped with earth cable in compliance with the ATEX directives.*



*Antistatic strips on the chute modules prevents the built-up of static electricity.*

airborne dust, the risk of creating an explosive atmosphere outside of the transport equipment is furthermore reduced.

### MEETING ATEX DEMANDS

Through the years, Cimbría Bulk Equipment has gained a great deal of experience when it comes to supplying loading and conveying equipment in compliance with all international regulations. The company has a standard working policy to insure that the supplied equipment is in compliance with the rules laid down in the ATEX-directive. Not only are the assembled parts scrutinized but the complete working unit where all factors including the build-up of static electricity and surface temperatures are taken into consideration.

Key words in connection with ATEX related equipment is approval, marking and documentation, where the manufacturer's declaration plays a key role.

As part of the approval of the Cimbría Moduflex loading chutes, is the compilation of a comprehensive technical dossier, which contains considerations concerning health and safety

aspects relevant to the loading chutes in relation to the ATEX-directive.

#### SUPPLY OF SOLUTION FOR LOADING GRAIN PRODUCT INTO SHIPS

Due to the factors mentioned above Cimbria Bulk Equipment has already supplied several Moduflex loading chutes manufactured for plants where dust control, hygiene and compliance with the ATEX-directive are absolute pre-requisite for the delivery. Cimbria Moduflex's partner in Lithuania, Firma Liucija, has most recently placed an order for a Moduflex loading chute of the type V650F for loading grain into ships. The loading chute is capable of loading up to 1,200m<sup>3</sup>/h. Due to the nature of the product the loading chute is provided with explosion-proof components in accordance with the ATEX directives. The chutes are equipped with 36 chute modules with antistatic strips which gives the chute an extended length of approx. 25,000mm.

To ensure dust-free outloading into ships the chute outlet is equipped with a heavy duty dust-skirt in order to encapsulate the dust arising when the product is falling onto the peak of the

product pile during the loading process. Two rotating indicators, placed in the chute outlet, signal automatically hoisting of the loading chute as the loading proceeds.

The chute is equipped with a cardan joint i.e. a conveying boom with the ability to pivot up and down in conjunction with the loading scenario. The cardan joint is designed for an operational movement between – 20 and +20° and a parking angle of 20°. The purpose of the cardan joint is to keep the loading chute in a vertical position at all times. This can both be in the loading situation, where, due to various ship sizes or due to large differences in tidal water, there is a need for different heights of the loading chute position. But it is also required in the parking situation. It is clearly necessary to keep the loading chute in a vertical position during loading to enable the correct flow of the product, and to keep the wear factor on the inlet and guide cones of the loading chute to a minimum. Apart from this, without the cardan joint there would be an increased load on one or two of the wires, too, which could eventually result in damage to the chute.

The order follows a series of orders for Moduflex ship and stockpiling loading chutes all designed to meet heavy duty requirement in terms of capacity and durability.

#### Loading solution for flour, Valsemoellen, Denmark

The Danish company Valsemoellen A/S is a member of Abdon Mills, a family-owned Scandinavian mill group, with 600 employees worldwide. Valsemoellen produces grain and flour products for industry, catering, bakeries and retail. The Valsemoellen in Koege, Denmark, grinds grain 365 days a year, 24 hours a day, which means that good, reliable machinery is required. As a result thereof, Cimbria has delivered and installed a new plant for reception of grain.

The new plant includes chain conveyors, bucket elevators, baffle plate weigher, sampler, magnetic separator, Delta cleaner and new pipework with a capacity of 100tph (tonnes per hour).

The plant in Køge grinds wheat and rye in particular, but also other types of grain and species such as white wheat and spelt are processed.

In connection with the installation of the new equipment for grain reception, the company has taken the opportunity to replace 3 existing loading chutes with newer models, i.e. 3 Moduflex type S300TSMJ loading chutes replacing Moduflex loading chutes from 1992.

The Moduflex loading chutes are manufactured in accordance with EU regulation no. 1935/04, and thus meet all requirements concerning contact with foodstuffs.

Cimbria Bulk Equipment supplies dust-free chute systems through a network of agents in more than 30 countries around the world.

## DON'T WASTE TIME AND MONEY COLLECTING DUST

When OPPD was ready to optimize their plant to address dust mitigation, they turned to Martin. Martin conducted a safety and materials handling audit, which led to rebuilding coal transfer points to contain dust and reduce spillage.

*"Martin has been very responsive... throughout our on-going relationship, giving us competitive pricing, standing behind their product and ensuring that they operate reliably,"*

– Kirk Estee, P.E. Material Handling Supervisor at OPPD.



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## Dry Fog system installations by Dust Solutions, Inc.

Bulk carriers constitute an estimated 40% of the world's merchant fleets, transporting the five major bulk commodities (iron ore, coal, grain, bauxite and alumina and phosphate rock) and other similar cargo to ports around the world. As the port's role continues to evolve in today's economy, the demand for efficiency in material loading, unloading and transport to end industrial users has evolved as well. Ports and related industries responsible for the movement and processing of dry cargo are under increased pressure to handle materials expeditiously while finding methods to reduce the impact they have on the environment during handling and storage.

Certain types of cargo such as cement, coal and iron ore, are particularly problematic as they have the potential to affect air quality and create dust, while also being highly susceptible to moisture. Other dry bulk cargo such as fertilizer has high concentrations of organic material that has the potential to negatively affect marine life and vegetation in the event of spillage or heavy winds which can carry the material to nearby areas.

Dust Solutions, Inc. (DSI), a US-based manufacturer, provides customized solutions to the bulk material handling industry to prevent fugitive dust emissions for a variety of industrial applications. Among these, shiploading and unloading installations have been successful in the most challenging conditions. Installed on existing infrastructure and equipment, DSI's Dry Fog systems for ship loading chutes and barges enable system operators to suppress dust while accommodating variable conditions such as humidity and wind coming off the water.

Using only compressed air and water, DSI uses ultrasonic nozzles and an agglomeration technique that can provide over 90% dust suppression efficiency while adding less than 0.1% moisture to the material. Unlike water spray or misting systems, Dry Fog systems create droplet sizes comparable or in some instances smaller than the dust particle, mimicking the effect of fog that 'scrubs' the air after a rainy day and effectively suppressing PM2.5 and PM10. Amongst its many advantages, Dry Fog systems do not wet the material and therefore do not add any additional weight to the product and are designed and engineered for existing equipment and do not require any collection media, which makes this type of solution a favourable option for ports that must quickly address an environmental compliance requirement.

DSI has recently installed Dry Fog dust suppression systems at several port facilities, helping clients address two key areas of dust creation, the discharge point and area of impact where the bulk material lands. Systems can be installed at the loading/unloading location as well as at transfer points to suppress dust during material transfer.

### Examples of successful applications include:



*Dry Fog manifold which fills the open barge with fog and prevents dust from escaping the hatch during the loading process. (Material – cement.)*



*A Dry Fog ring custom designed and engineered for the loading chute. Higher capacity ultrasonic nozzles and custom nozzle adaptors provide operators with the flexibility to provide a stronger fog that covers a larger area and distance of the ship's hatch. (Material: coal.)*



*Dry Fog prevents fugitive dust from escaping hopper during unloading. (Material: bauxite.)*

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Image: LISTENOW Loading System 409.0 with fill-level indicator

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## Getting the lead out: CRT recycler uses atomized mist to control dust

For the average consumer, when a television or computer monitor dies, the excitement of purchasing a shiny new unit often eclipses any curiosity over where the old device goes. Regardless of whether it was dropped off at a landfill or recycler, if the person lives in the Northern Midwest of the United States, it's likely to end up in the hands of Kuusakoski Recycling, one of the few companies in the US equipped to address the complexities of recycling cathode ray tubes (CRTs).

Modern flat screens made of panel glass have been on the market for nearly two decades and are very different technology from tube televisions containing CRTs made of leaded "funnel glass." According to Kuusakoski's Production Supervisor Marc Artozqui, "Old TVs are still around. In fact, there is currently a five-year backlog of recyclable CRT stock just in our area alone."

A CRT is a vacuum-sealed tube made entirely of funnel glass, ending in a florescent screen with one or more electron guns on the narrow end. Containing a high level of lead, funnel glass is less fragile and is intended to protect consumers from harmful X-rays emitted by the electron guns while the television is on.

"During the recycling process, the tubes produce a considerable amount of dust, requiring all of our employees to wear protective coveralls and face masks when in the facility," Artozqui explained. "We invited Dust Control Technology to the plant to make an assessment, and after a thorough inspection, their team came up with a solution that has eliminated the hazy, dusty atmosphere."



*Crushed funnel glass is dropped through a tall spout into a lined steel transport container.*



*Kuusakoski is one of the few US companies equipped to recycle cathode ray tubes (CRTs).*

### PROCESS OF ELIMINATION

For more than 100 years, the Finnish company has recycled materials according to the philosophy of its founder, Donuurd Kuusakoski: "Everything is re-used," which applies to the company's current treatment of CRTs.

Television sets and monitors are delivered whole or in pieces to the facility in Peoria, IL, where the recyclables are immediately loaded into a hammer mill to crush the debris. The resulting scrap is then conveyed through a separation process, in which metal is discharged by magnet and plastic is removed. What's left is crushed leaded funnel glass and inert panel glass. Unlike funnel glass, panel glass breaks into beads, which makes it easy to screen out before the two types of glass are transferred to an observation conveyor. There, workers closely inspect the size and quality of the end product.

Once deemed adequate for transport, the funnel glass is transferred to a loading conveyor and dropped through one of two tall spouts into a specially designed 40 cubic yard (30.5m<sup>3</sup>) steel transport container with a liner, which is tightly sealed before it leaves the plant. After one container is full, the conveyor is switched to the second spout, so there is no break in loading. The product is then transported by truck to a partner facility where de-leading renders it inert, allowing it to be made into Klean Kover™, an alternative daily cover for landfills.

"We produce approximately 35,000 pounds of processed recyclable glass every hour," Artozqui estimated. "The air quality control measures include a plant-wide HVAC system, but fugitive dust can still be a problem inside the facility if it's left unchecked."

### COMBINING INDOOR DUST CONTROL METHODS

The Kuusakoski plant is enclosed, with as many as 22 people on a shift. In addition to requiring protective gear to avoid lead exposure, the company's objective is to further reduce potential worker exposure by addressing all sources of airborne dust. "Our hammer mill has a bag house attached to it, and the entire unit is located in a sealed room with its own HEPA filtration system," Artozqui pointed out. "This solution took care of a major issue, but didn't mitigate dust produced at different transfer points and our next biggest culprit: the two transport container discharge spouts."

Dropping 8ft into the container, fine pulverized funnel glass emitted fugitive dust particles into the air that lingered



*Placed at the end of each spout, the DB-Rs feature 18 atomizing nozzles apiece to fracture the water into a fine mist.*

throughout the facility before being caught and cycled through the HVAC system. Heading the DCT team that visited Kuusakoski was Derek Schussele, a dust control specialist. “I’ve seen this cargo loading process before with other applications, similar to the way coal is put onto a train or barge,” he observed. “However, it’s rare that we apply our dust suppression technology in a totally enclosed space like that. One of our goals in this application was to avoid water pooling and excessive runoff.”

The team first tested the volume of atomized mist needed to be effective, using a 26-inch (0.66 meter) diameter DustBoss® Ring (DB-R). The stainless steel ring manifold was fitted with low-volume misting nozzles, producing millions of tiny water droplets just slightly larger than the diameter of a single human hair. The mist flows out of the ring much like a curtain drawn around the discharge, trapping fugitive particles and directing them back into the container using the company’s Variable Particle Sizing (VPS) approach, matching droplet size to dust particle size for maximum suppression.

After testing, the DCT team determined that an even smaller unit would produce even more effective results. Placed at the end of each spout and surrounded on the outside by 20 overhanging rubber flaps to further aid material flow, the two 23.5 inch (0.59 metre) stainless steel DB-Rs took less than an hour to install. A standard garden-type hose connects to the 60 PSI (4.14 BAR) municipal system and feeds water through an in-line 75-mesh, 200-micron filter and into the manifold. The water is then forced through 18 specialized nozzles, which fracture it into a fine mist.

“We adjusted the water volume to the lowest possible GPM

to control flow rate and still maintain the required dust suppression level,” Schussele explained. “Using VPS without outside wind disturbance achieved the optimum particle capture rate with much less water than typical outdoor applications.”

#### THE SCIENCE OF VARIABLE PARTICLE SIZING

Rather than just saturating surface material like a high flow sprinkler system, VPS matches the size of the droplets to that of the fugitive particles. Every substance — from funnel glass to coal — produces different sized particles based on its individual characteristics and the method of processing. To achieve optimum effectiveness, droplets and dust must be roughly the same size, inducing the maximum number of collisions with the particles and pulling them to the ground. Droplets that are too large create a ‘slipstream effect’, in which air travels rapidly around the droplet as it falls, causing smaller particles to get caught within the air stream and deflected around the droplet, rather than being absorbed.

For example, according to the National Institute of Environmental Health Services (NIEHS)<sup>[1]</sup>, particles are visible at around 50 microns, inhalable up to 100 microns and tend to linger in the air at sizes of up to 200 microns. Standard flat head industrial sprinkler systems produce rain-like droplets between 200 and 1000 microns in size,<sup>[2]</sup> which are far too large to capture smaller particles. The water saturates surface material, but does not address particles that are already airborne. A low-volume atomized mist unit produces droplets between 50 and 200 microns in size — creating a larger percentage in the low size range, while using less water. After following the material flow into the container, the mist settles, suppressing surface dust as well.

“The inhalable glass dust particles that try to escape the material stream can’t avoid the curtain of atomized mist surrounding it,” Schussele pointed out. “By determining the correct droplet size range and water flow rate, we provided

[1] Staff, “Particles: Size Makes All The Difference”, National Institute of Environmental Health Services. Research Triangle Park, NC, 2006.

[2] Staff, “Sprinkler Application Rate”, Washington State University, Prosser, WA, 2015.

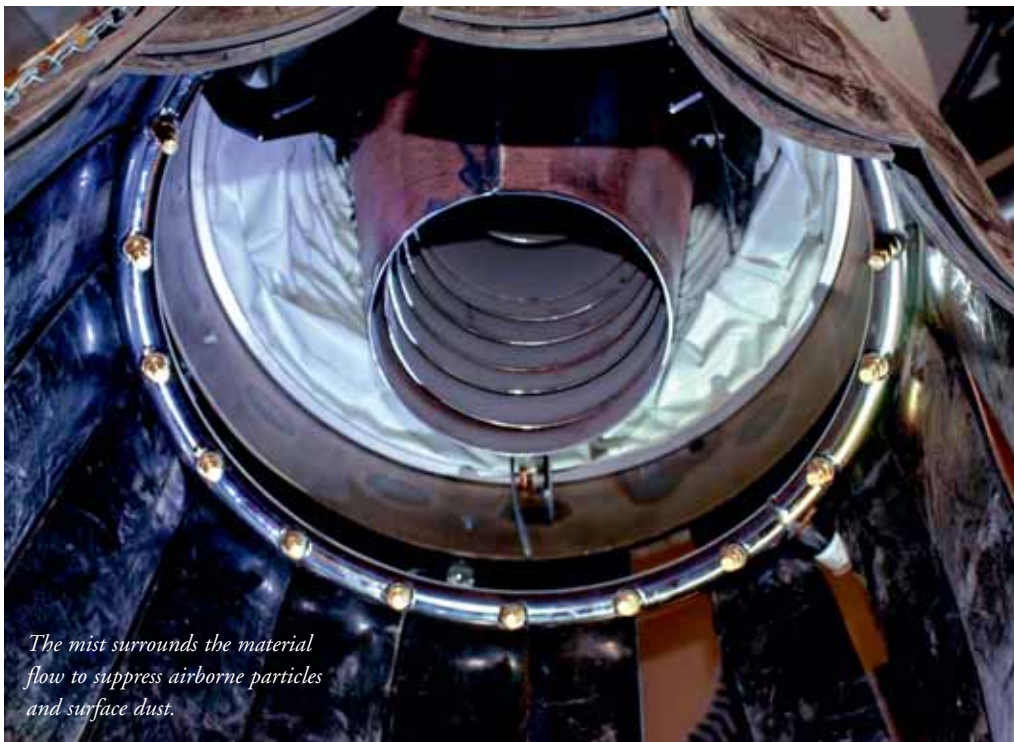


adequate dust suppression both in the air and on the surface, while still being able to avoid filling the container with liquid.”

Flow rate is important in this application, because the volume of water may increase the container weight and change the consistency of the delivered material, potentially affecting transport costs and subsequent processing. The 23.5-inch DB-R's maximum water usage is just 9.52 GPM (36 lpm), causing little or no pooling or runoff within or outside of the transport container.

#### IMPROVED ENVIRONMENT AND MORALE

Artozqui said that the whole staff was surprised by how the system almost immediately cleared the haziness within the facility. “DCT visited us on several occasions. They really took the time to assess the issue and come up with the best and most cost-effective solution,” he concluded. “The installation was non-disruptive, and their follow-up has been excellent. I look forward to working with Derek and DCT on future projects.”



*The mist surrounds the material flow to suppress airborne particles and surface dust.*

Since starting business over a decade ago, Dust Control Technology has pioneered atomized mist designs, providing innovative dust and odor suppression solutions for applications in coal processing, waste handling, demolition, mining, recycling, scrap and slag handling. Headquartered in Peoria, IL (USA), the company specializes in tailoring systems to address specific processing environments for customers around the world.

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## A tale of complex transfer point solutions

Figure 1: Re-claim conveyor.



The successful operation of a conveyor system transfer point requires that the material be loaded properly on the receiving belt in such a fashion that dusting and spillage are kept to a minimum in order to comply with stringent environmental regulations that are now in place, writes Phil Wowak.

In today's world where it's necessary to increase conveyor efficiencies while reducing the operating cost, the conveyor transfer points must be properly engineered using the best designs and components in order to accomplish these goals.

The most common transfer point is a simple one conveyor to another in either a straight line or where the belts are oriented at a slight angle to each other travelling in one direction. These types of single point transfer chutes are relatively easy to design.

Where it becomes a challenge is when there are multiple feed points on the system or when the receiving conveyor is a reversing belt. Engineering of these transfer points need special considerations and components that are not normally incorporated in the more common examples given above.

In this article, we will discuss a very complex stacker reclaim system with a reversing belt.

This involved a stacker re-claimer conveyor system at a major northeastern US coal-fired power plant. It proved to be more complicated and required a more in depth solution that included a 3-DEM® Material Flow Analysis to solve some of the problems. The chute was designed to transfer up to 1,400tph (tonnes per hour) of bituminous coal from the 42 inch re-claim conveyor to the 60 inch reversing yard belt. The reclaim conveyor speed is 700 feet per minute with a capacity of 1,400tph during re-claim operation. The 60 inch reversing yard conveyor speed is 850 feet per minute and has a capacity of 3,000tph in stack out mode. (See Figure 1)

**Challenge:** This transfer point was a major problem area for the coal yard operators. While in reclaiming operation, the chute would build up and plug when running wet coal or during freezing conditions. Chute heaters, vibrators and internal baffles were added but the problem still remained. Due to the angle of discharge onto the 60 inch receiving conveyor, off centre loading caused serious belt miss-tracking and constant spillage and clean up issues. Electric heat tracing of the chute was installed to help prevent freeze up during winter operation as well as several vibrators to try and keep the coal flowing. With all of these

Figure 2: Off centre loading onto yard belt.



installed, they still experienced major coal build up and plugging of the chute which caused delays in being able to send coal to the power house. (See Figure 2)

To solve some of these problems, various chute simulations were created and evaluated by using 3-DEM® Chute Design Software to solve the problem. During the final review and approval of the chute design, a problem was discovered due to a frequently occurring operator error. During stack out at 3,000tph, the operator can cause the system to reclaim at the same time. Going the wrong way on the belt! This causes up to 1,400tph going the wrong way on the yard belt. The only way to make it work would be to use a split chute design with a diverter gate and actuator. The coal yard supervisor was reluctant to incorporate a diverter gate into the new design because of the problem of the gate freezing up during winter operations. How do you change the direction of the coal stream inside a transfer chute without using a diverter gate? The design engineers came up with a solution that used a movable deflector hood in the head discharge area to divert the coal stream into one of two outlet chutes. This design eliminated all of the buildup and freezing issue that occur when using an in line, swing blade diverter gate. (See Figures 3 & 4).

A new transfer chute was modelled and designed to allow

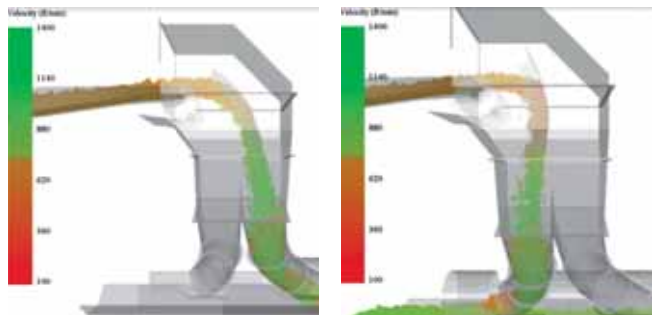


Figure 3: Hood in Reclaim Mode. Figure 4: Hood in Stack Out Mode.

the coal to be loaded onto the receiving belt, moving in the same direction, speed and in the centre. The new design also eliminated corner build-up and reduced wear due to impact and miss-direction. The adjustable upper deflection hood was power actuated to prevent a chute overload when the upset condition, reclaiming while stacking out was occurring. The hood was



Before.



After.



automatically positioned in the head chute to direct the coal during either stack out or reclaim. This prevents a chute overload during the upset condition.

Three different types of internal wear liners were used in different areas of the transfer chute depending on what type abrasion was occurring. A Chromium Carbide Overlay plate was used in the high velocity flow area and either UHMW or a Hardened Stainless Steel Liner was used in the splash and dribble chute areas.

The new transfer chute now operates without build-up and the coal flow is center loaded onto the 60" receiving belt at the same speed and direction. This reduces wear and belt

mis-tracking as well as fugitive dusting and spillage clean-up. There is no longer a need for chute vibrators and the plant has still not re-installed the heaters.

To create an efficient, safe and reliable transfer point there are many essential products that eliminate spillage, control dust, support the belt and make the system run safer and more productive.

We have discussed several in this article but not all. Effective belt cleaning systems, belt tracking devices, dust fogging systems and more are often necessary to reduce spillage and dusting as well as operate in compliance with all of the current regulations that are now in place.

## Nothing gets out here anymore!

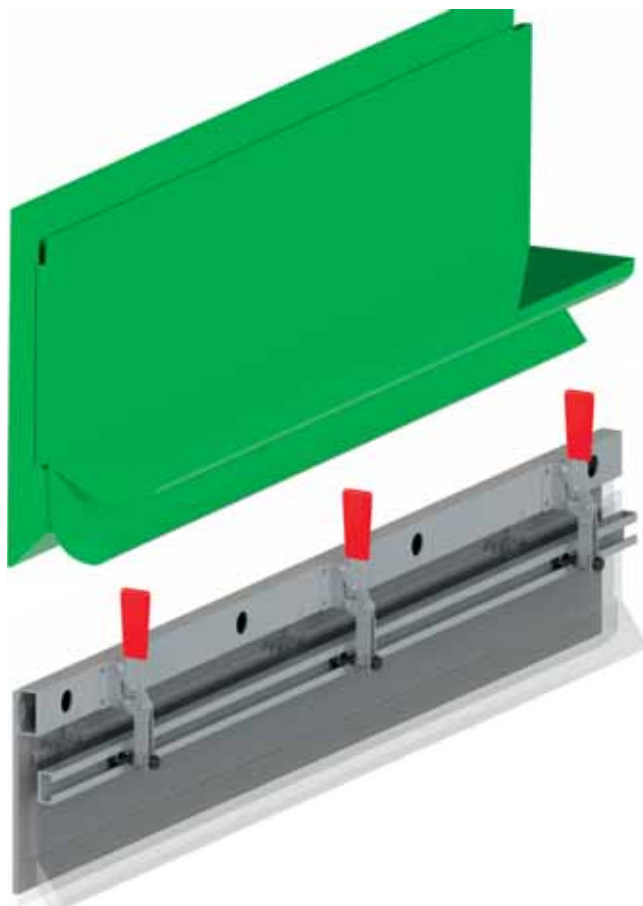


### TRANSFER POINT SEAL STARCLEAN® SEAL

F.E. Schulte Strathaus' new two-piece STARCLEAN® SEAL transfer point seal eliminates material and dust emissions in belt conveyor transfer points and reduces maintenance and operation costs.

At first, the material guiding primary seal keeps the bulk material inside the chute. The secondary dust seal, which is soft but abrasion resistant is adjustable in height and avoids dust emissions with smooth pressure.

Enabled by a carefully chosen combination of special, multi component materials in different hardnesses the STARCLEAN® SEAL system reaches highest lifespans and optimum belt-saving properties. Optionally F.E. Schulte Strathaus offers a toggle lever clamping set for simple installation and maintenance.



## Donaldson builds on innovation and growth

*Image 1: Filtration solution for gas turbine system.*



For 100 years Donaldson has built on innovation and growth and has developed into one of the world's leading suppliers of filtration solutions. Currently, Donaldson is strengthening its gas turbine range through its acquisition of Northern Technical. As well as the powerful and long-lasting gas turbine filter systems with pulse cleaning system (image 1) from now on highly efficient static air intake filters will also be available with excellent technical features.

The Northern Technical series includes the NorrVee and NorrCel compact filters, which can also achieve high separation efficiencies and long service lives even under challenging or extreme environmental or climatic conditions.

The NorrVee filter systems (image 2) are also water and oil resistant. Moisture that has been sucked in is already separated on the filter surface and can therefore be prevented from entering the airflow. Thus, the turbine stages are optimally protected and their lifetimes increased. This technology that so far has been successfully implemented mainly in power plants in the Middle East is now available to the operators of gas turbines in Europe, America, Asia and Africa – together with a worldwide service offering.

Erwan Clément, Head of Gas Turbine Systems EMEA: "We cover the entire process chain - from the development of the complete air intake filter system, the manufacture and sales right through to worldwide service. At the same time our maintenance offering for the user is just as important as the consultancy to optimize existing systems."

### **POWERCORE®: SMALL BUILD SIZE FOR HIGH RETENTION EFFICIENCY**

Donaldson also develops user-friendly innovations in dust collection technology that sets benchmarks: the PowerCore® technology, for example, offers the best prerequisites for a highly efficient dust collection and a simplified filter change, as well as quick maintenance. The systems are up to 70% more compact than conventional dust collection systems with filter bags and



*Image 2: The NorrVee filter systems are water and oil resistant.*



*Image 3: Replacing the filter pack only needs about a fifth of the time in comparison with conventional dust collection systems with filter bags.*

the replacement of the filter pack only needs about a fifth of the time in direct comparison (image 3). At the same time significantly higher filtration efficiency is reached: Independent laboratory tests confirm that PowerCore® filter packs reduce the emissions by up to 78% in comparison to standard polyester bags.

The small build size with high retention efficiency, as well as the easy handling of the filter pack can be traced back to the Ultra-Web® nanofibre technology, among others, developed by Donaldson,

which in combination with the latest findings of filter media processing leads to the particles being separated without depth-loading (image 4).

These advantages can now also benefit the users of dust collection systems that are installed in potentially explosive atmospheres. The PowerCore® program has been expanded across the entire volume flow performance range from 1,000m³/h to 30,000m³/h with systems that were developed, according to the ATEX Directive for use in explosive atmospheres of zones 21 and 22, as well as zones 1 and 2 for gas (image 5). In this way Donaldson has met the higher requirements of the industry for decades with simpler and more service friendly maintenance of dust collectors. The decisive step to a more economical and sustainable dust collection technology has been achieved not just with the simple filter change and long filter service lives, but especially by the incomparably simple filter change. The sales and engineering team of Donaldson supports customers all over the world on-site in the choice of the suitable PowerCore® system for their respective applications.

Founded 100 years ago, Donaldson (NYSE: DCI) is a global leader in the filtration industry. The company's innovative filtration technologies improve people's lives, enhance Customers' equipment performance and protect the environment. More than 12,500 employees support Customers at 140 sales, manufacturing, and distribution locations.



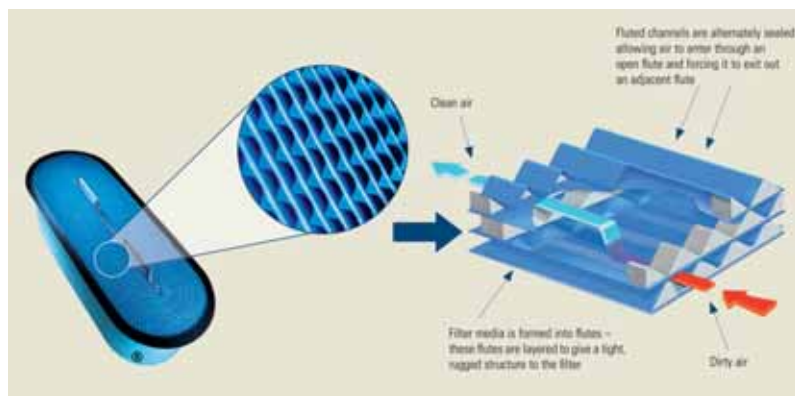


Image 4 (above): The PowerCore® filter packs combine the proprietary Ultra-Web® nanofibre technology with the latest findings of filter media manufacturing, so that the particles are collected without depth-loading.

Image 5 (right): Donaldson is expanding the PowerCore® programme across the entire volume flow performance range from 1,000m³/h to 30,000m³/h with systems that were developed, according to the ATEX guidelines for use in explosive atmospheres of zones 21 and 22, as well as zones 1 and 2 for gas.



## Pneumat Systems offers Cardox CO<sub>2</sub> blaster for clearing blockages in pre-heated towers, silos & bins

The Pneumat Systems Cardox CO<sub>2</sub> Blaster produces a controlled release of liquid CO<sub>2</sub> at up to 34,000psi with the power to break concrete, coal and other rock-hard materials, clearing blockages, plugs and chokes in preheater towers, silos, kilns and bins. Pneumat's Cardox CO<sub>2</sub> Blasting System is simple, efficient and reliable, effectively making misfires a thing of the past. Because Cardox does not present a fire hazard, the system is widely used in locations where dust, chemicals or hazardous combustible materials are present.

During the process, high-pressure CO<sub>2</sub> is instantly released through ports of the discharge head, creating a powerful force that dislodges tonnes of blockage in less than a second. Once fired, the Cardox tube is rebuilt with a new Cardox safety heater, shear disc and sealing washer, and recharged with CO<sub>2</sub> for another use. Pneumat's Rapid-Fill Pump and Auto-Fill Head have revolutionized how Cardox tubes are filled, making the process simple, fast and convenient.

In addition, Pneumat's qualified, experienced technicians are available to assist with questions, as well as provide comprehensive on-site training.

Pneumat's industry leading experience combined with custom engineered, innovative products has been helping solve bulk material flow problems since 1982. Pneumat Systems products are designed to keep bulk materials moving in the ethanol, grain, cement, feed and coal industries. Pneumat's equipment solutions are designed for use with various materials including DDGs, powdered cement, coal, fertilizer, powdered chemicals, minerals, ash, biomass and more.





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**ORTS** GmbH





# Fugitive dust containment with PEBCO® Self-Contained Dustless Loading System

PEBCO® SCDLS and positioner.



PEBCO® recently introduced the patent-pending, Self-Contained Dustless Loading System, or SCDLS. The SCDLS incorporates a dust collector integral with the loading spout. The system provides an innovative and extremely low profile design; and offers highly effective dust control for environmentally responsible loading of dry, dusty materials into trucks, railcars, ships, barges, and stockpiles.

An essential advantage of the SCDLS design is the fugitive dust captured is re-entrained into the product being loaded, minimizing product loss. Additionally, handling of the captured dust by ancillary equipment is not required. This design provides a complete and integrated dust control solution for loading trucks, railcars, ships, and material stockpiles.

The clean air fan includes a damper system for tuning the airflow through the SCDLS. The ability to easily tune the airflow allows application with a wide variety of products. The adjustable damper system permits the operator to capture fugitive dust without capturing the product being loaded.

Controls are available to operate both the loading spout and the dust collection functions of the SCDLS. Controls can be custom engineered for each user's specific loading requirements.

The dust collection feature on PEBCO's SCDLS-22 adds only about 20 ½" to the overall equipment stack-up, making it possible to replace almost any existing loading system with a PEBCO® SCDLS.

Also, in new projects, the reduced height of the SCDLS reduces the costs associated with steel structure and material transport systems by decreasing overall structure height.

The PEBCO® SCDLS was developed in collaboration with Donaldson/Torit utilizing their proprietary Power Core filter media and pulse system. Power core Filter cartridges are available in both conventional and static dissipating materials of construction.

Cartridges are easily replaceable through large access panels located on the side of the SCDLS (with no special tools required) and all wear components are bolt in for ease of replacement.

## FEATURES OF THE SCDLS INCLUDE:

- ❖ Environmentally-responsible loading of dry, dusty materials
- ❖ Innovative, and extremely low profile
- ❖ Industry minimum overall height
- ❖ Field replacement possible for almost any existing loading system that does not currently include a dust collection feature
- ❖ Power Core Filter cartridges available in conventional and static dissipating
- ❖ Donaldson/Torit's proprietary Power Core filter media and pulse system
- ❖ Dust collection cartridges easily replaced through side access panels with no special tools required
- ❖ All wear components are bolt in for ease of replacement

Seeking solutions for its customers' unique material handling problems has led to the development of several patented products, features, and options for equipment used in the dry bulk solids handling industry. It has proven PEBCO's experience, versatility, and innovation.

To enhance its drive for complete customer satisfaction, PEBCO's quality management system has been certified to ISO 9001:2008.

PEBCO® is recognized worldwide as a manufacturer of powder and dry bulk solids handling equipment.

Find PEBCO's Self-Contained Dustless Loading System on PEBCO's YouTube Channel.





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# Taking cover?

## enclosed storage of **bulk** commodities



*Even irregularly shaped, super-sized stockyards can be enclosed with Freedom® technology.*

### Covering existing stockpiles with domes

Open air stockpiles are a common sight around the globe, from ports to mountains to deserts, *writes Melanie Saxton of Geometrica*. Stockyard operators face rain, fluctuating temperatures and wind, which can deplete dry bulk inventories and affect the chemical composition of raw materials. But more importantly, manufacturers across various sectors are focused on the environmental impact of uncovered piles. Dust emissions and contaminated runoff can affect surrounding communities, vegetation and wildlife.

With new environmental regulations across the world, covering existing stockpiles is or will be a requirement. Eco-friendly initiatives include the design and installation of long-span storage solutions that help stockpile operators tread more softly around Mother Nature.

The goal is to seamlessly connect bulk storage and materials handling solutions with mining, cement, fertilizer and power generation operations. Of course, manufacturers want to cover their stockpiles; if only covering existing stockpiles were easy. Most of them were not designed to be covered and the mere thought of doing it sounds impossible without downtime and extremely high costs.

#### CHALLENGES IN COVERING EXISTING STOCKPILES

Conventional building systems have limitations and simply cannot accommodate covering large spans on uneven terrain:

- ❖ brutal slopes;
- ❖ typhoon winds;
- ❖ hazardous and combustible raw material;
- ❖ punishing snow loads; and
- ❖ corrosive marine environments.

As a stop-gap measure, stockyard operators have tried storing raw materials in silos, which are small, expensive and often impractical. A long-term solution was needed, and Geometrica answered the call with an all-terrain application designed specifically for industries that handle large volume bulk materials.

#### BENEFITS OF BULK STORAGE DOMES

Roel Castano, Vice President of Geometrica, addressed storage and environmental concerns as a speaker at the Cemtech Conference in Bangkok in June 2015. He noted the obstacles faced by global stockpile operators and offered an alternative to the limitations of traditional structures. Geometrica's



revolutionary patented all-terrain building system offers economical and efficient bulk storage options while lowering lifetime maintenance costs through excellent long span design, cladding options and safety accessories.

Castano noted that Freedome® technology has taken long span storage to, literally, new breadths and heights. Freedomes — Geometrica's trademark for free-style domes — provide all the advantages of circular domes with a non-circular plan. All tube members are different and may have lamella, kiewitt or lace insurface patterns and single or double structural layers. Big foundations for these large span roofs are not required, even at spans up to 300m. This allows versatility and flexible design options for irregular piles and stockyards.

The Geometrica system includes a node, or linear thread aluminium connector, that joins galvanized steel or aluminium tubes. The ductile behaviour develops 130% of the steel tube's rated yield strength and transfers bending. It features human-scale modules, dense packing volume, and easy installation



*Geometrica VP Roel Castano addresses the Cemtech Conference crowd in Bangkok.*

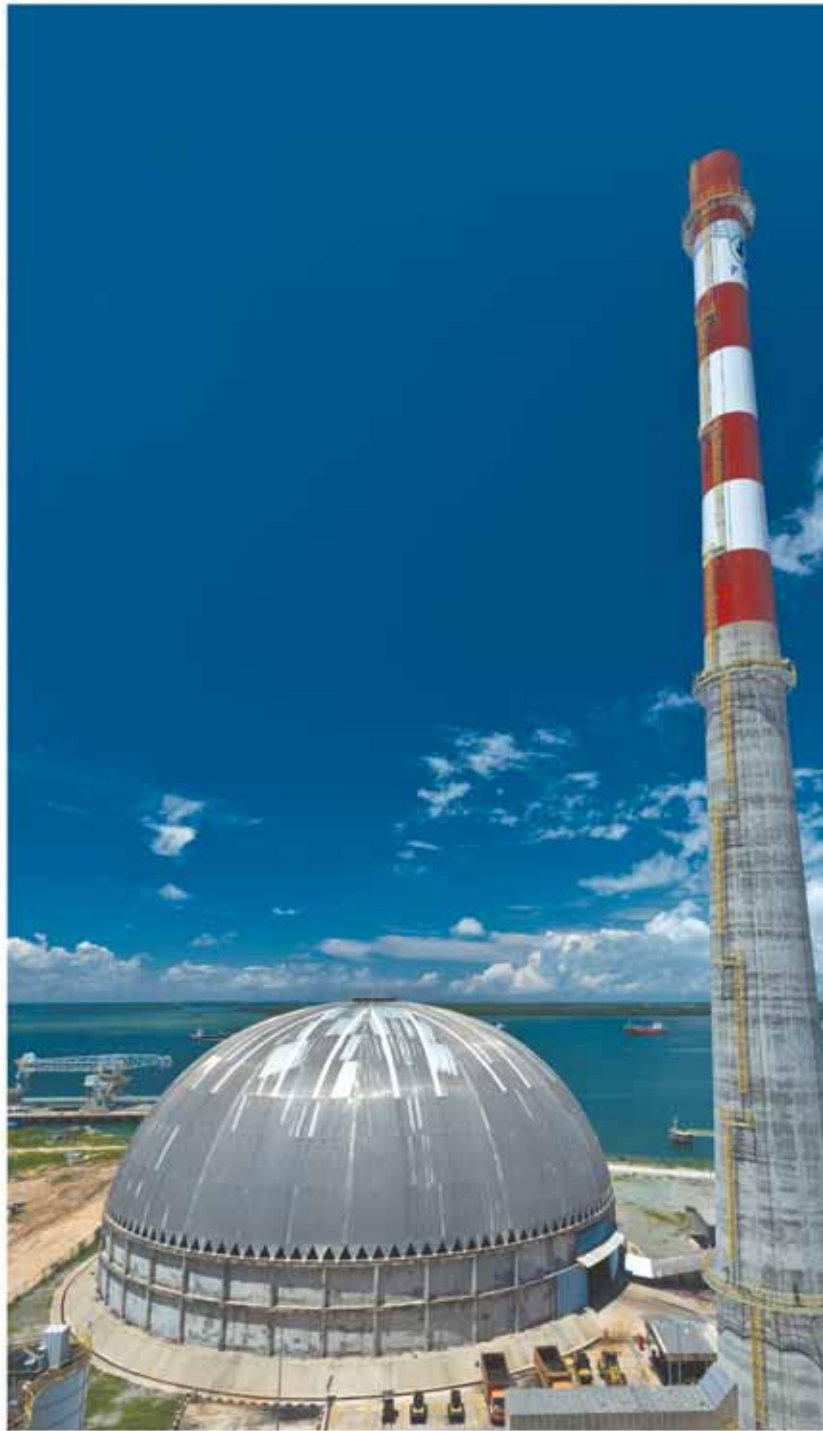


*A multitude of raw materials, from limestone to clinker to coal, are safely enclosed under Geometrica domes.*



*Geometrica domes have changed the landscape in 30 countries... and counting!*





## DEFEAT DUST WITH A DOME.

Tread softly around Mother Nature. If your stockpile produces dust, tame it with a freestyle dome or barrel vault. Whether quayside or on a mountain, protect the surrounding environment while preserving your own stockpile from erosion and loss of fines. We'll build right over your live operations and eliminate downtime. Corrosive saltwater? No problem. Typhoon-force winds? No worries. Torturous snow loads? Never fear, we've got you covered. Build a Geometrica dome for your raw materials and the dust is history.

 **Geometrica**®

[www.geometrica.com/bulk-storage](http://www.geometrica.com/bulk-storage)



requiring minimal use of rigging equipment with no field welding required.

Only Geometrica's non-traditional structures provide the strength and span necessary to enclose stockyards of any size in any location. The column-free space is unique in that it allows the transfer of moments across the joint. Notably, the barrier-free interior allows the maximum use of space, while allowing the free-flow of traffic, personnel, vehicles, conveyers and other equipment — even while the pile is in operation. This equates to zero downtime or loss of productivity.



*Bulk openings, canopies, walkways, ventilation and natural lighting add to the functionality — and aesthetics — of each dome.*

#### ENVIRONMENTALLY POSITIVE IMPACT

Hundreds of uncovered stockpiles still exist worldwide and can benefit from Freedom® technology. Now mines, plants and factories can opt for a new vanguard in long span design in any terrain or climate.

Geometrica's environmentally sustainable enclosed domes protect stockyards of minerals, limestone, clay, clinker, coal, marl, wood chips, fertilizers and sulphur from outside elements, and ensure the landscape is protected from particulates and groundwater leeching — a win/win situation for manufacturers and the communities they serve.

#### ABOUT GEOMETRICA

Geometrica is an award winning international firm serving industrial and environmental protection markets worldwide. The company believes a culture of safety begins within an organization and extends to its products and services, and explicitly values ethics, safety, quality, learning and continuous improvement.

Worker safety is a priority — a value advanced by certifications in health, safety, environment, management and manufacturing processes.

Geometrica implemented a quality management system (QMS) through an internal company wiki, which helped achieve safety certification status in a minimal time.

- ❖ ISO 9001:2008 Certified quality management system;
- ❖ OHSAS 18001 Certified health and safety management system;
- ❖ ISO 3834-2 Welding Quality Certification; and
- ❖ EN 1090 construction products standard certification — New CE marking for design and manufacturing of components and structures made of steel and aluminium for the execution of structures.

As a second-generation dome builder founded on gridshell technology that has been in development for 50 years, the company leads the market in freestyle, long span and light weight domes and space frames with projects in more than 30 countries.



*An operating stockpile of solid fuel was covered with no downtime or loss of operations.*



## Covered storage systems at dry bulk terminals

Loose bulk materials are most economically stored outdoors, but some conditions can necessitate storage under cover, writes *Frank Warmoth, PE, Manager Business Development Bulk Handling and Terminals at Bruks Rockwood Inc.* When the materials are sensitive to contamination or natural elements, or where they pose a threat to the surrounding environment, it becomes necessary to store them in an enclosure. The equipment to store and reclaim a given material and the structure in which it is stored are interdependent and technical solutions have evolved along economic lines, coupling together types of enclosures with the equipment inside.

The first delineation is between manual handling and automatic storage and retrieval. Since manual methods like mobile equipment are inherently lower capacity and dry bulk cargo terminals typically require rapid unloading and loading of materials, only automatic high capacity solutions will be discussed here with emphasis on enclosed systems.

Its properties determine the best equipment to convey a bulk product, place it in storage, and reclaim it for processing or shipment. These decisions and the required storage capacity narrow the choices of storage structure. Process and shipment requirements determine the storage capacity. Requirements for FIFO (first in/first out), separation or blending, and the physical space available further clarify the options.

Generally, FIFO enclosures must be discharged from the bottom of the pile (e.g. gravity flow, plow, vibrating pile discharger, screw reclaimer, etc).

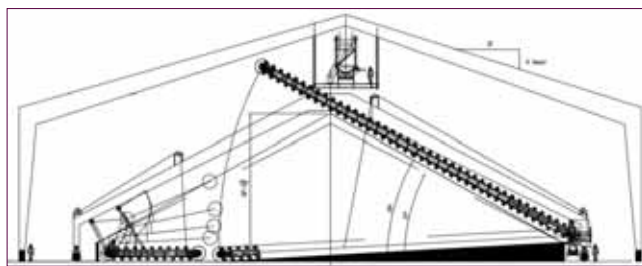
Separation into piles requires a large foot print, often a rectangular enclosure with discrete stacking and reclaiming or separate enclosures like silos and domes. It requires stacking and reclaiming equipment that can access each pile like a tripper, shuttle conveyor, or travelling stacker, and a scraper type reclaimer that reclaim from the top of the pile. Blending is best accomplished by a rake-type bridge reclaimer that reclaims across the full pile cross section.

Some classes of materials have fairly well-established handling and storage methods. An example is the use of silos to store free-flowing materials like grain and cement that are also

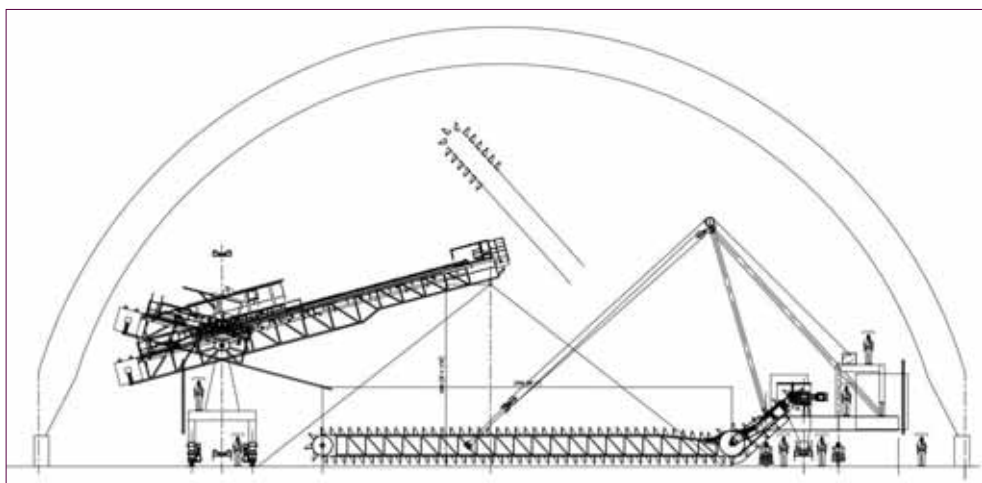
sensitive to contamination and moisture. Silos should be avoided for materials that are compressible, cohesive, or don't flow freely. The exception to this is when aggressive reclaiming equipment usually acting on the top of the pile is employed. Mechanical or pneumatic conveyors are used to fill the silos and gravity, often aided by vibratory dischargers is most effectively used to discharge onto conveyors. Silos occupy the smallest footprint per ton of storage.

### LINEAR SYSTEMS

Where high storage capacity is required, the most economical means of storage is a linear system in a structure with a rectangular footprint. Enclosures of this style require a large



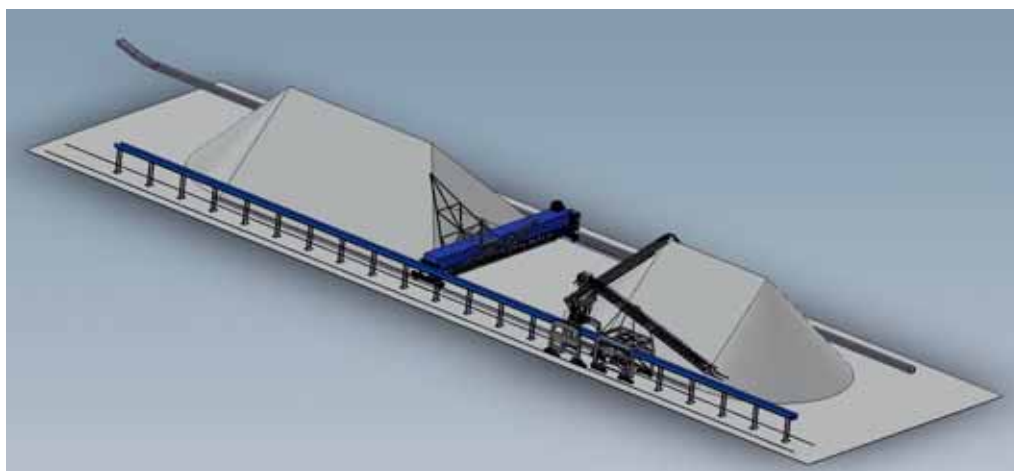
footprint per tonne relative to others. This is the easiest system to expand by simply increasing length of rails, conveyors, and structure. Different types of rectangular structures are utilized



with size and local capabilities often determining the most economical solution. Most storage halls are open between the outer walls to allow the equipment free access to the material.

This requires long-span structural concepts that can be accomplished with arches, tapered girders, trusses, geodesic panels, or hybrid structures. Pre-engineered metal buildings have been used extensively but tension fabric buildings are gaining popularity due to competitive cost.

The characteristics of the stored material must be considered including dust emission and corrosiveness



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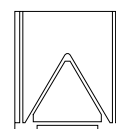
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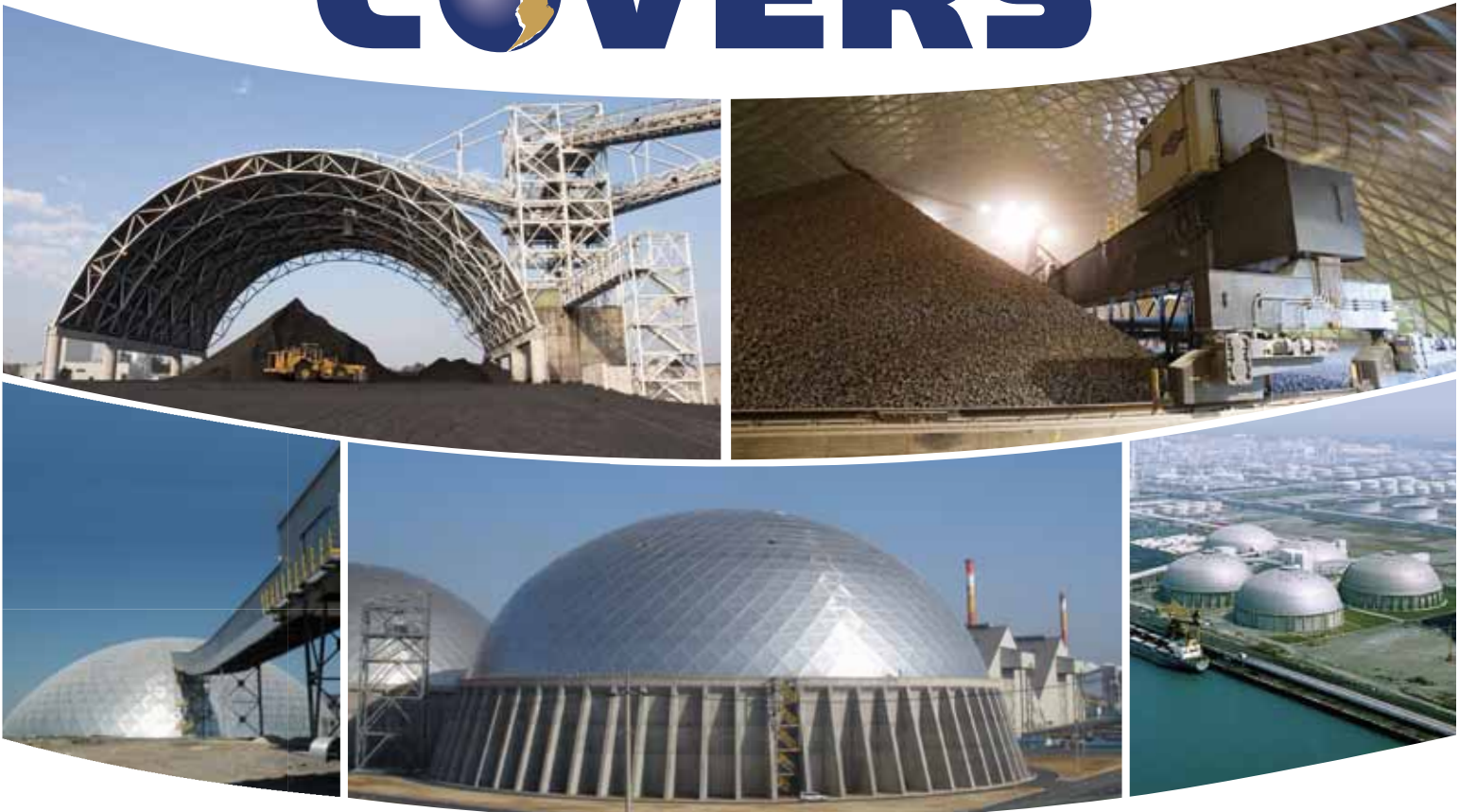
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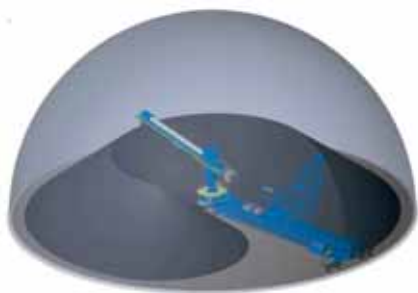
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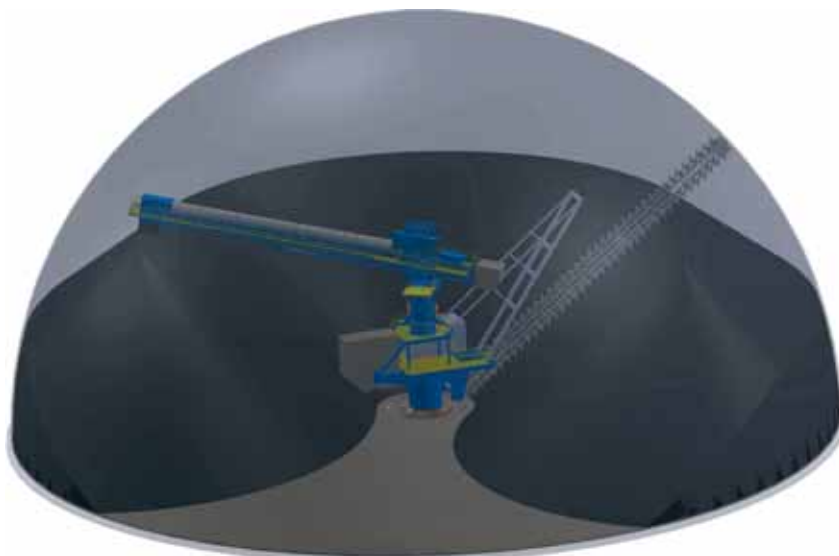


for loadings and protection of the structure. Some moisture-sensitive products must be stored in a controlled climate which increases enclosure cost considerably. In addition to HVAC equipment, the enclosure must often be insulated.

Linear systems usually require separate machines for stacking and reclaiming so each can act independently at the same time.

Stacking is accomplished by rail mounted machines at grade or in the roof of the structure. Travelling trippers and shuttle conveyors are the typical roof-supported stacking methods. Luffing stackers on rails at grade are an option when dusting is a problem.

Reclaiming can be accomplished by under-pile devices like screw reclaimers, plows, and vibratory pile dischargers. Ploughs and pile dischargers require expensive tunnels for removal conveyors raising the cost per tonne of active storage. Screw reclaimers have limited span and can also require costly cover structures for the reclaim conveyors. The most common method of reclaim is a rail mounted reclaimer which comes in several varieties. Most indoor machines are portal or counterweighted scrapers or bridge supported harrows. Scraper reclaimer mechanisms are basically the same whether the boom is counterweighted or supported by an A-frame portal. Using an



A-frame to support the boom allows a longer reach across the pile, and by using a shorter auxiliary boom the height of the machine is reduced for indoor use. Bridge reclaimers, also described as rake-type or blending bed machines, agitate material across the end surface of a pile as the machine advances, causing it to cascade to a chain conveyor that drags it to the discharge conveyor. This action is an effective means of blending the material contained across the pile cross-section. A scraper reclaimer can start at any point on the pile while the bridge reclaimer must always operate from an end, which is mainly a pile management issue.

#### CIRCULAR SYSTEMS

Circular stacking and reclaiming systems provide a means of medium capacity storage with automatic operation. These systems allow storage of a broader variety of materials than silos because a wider variety of reclaiming methods can be employed and arching of material can be avoided. Circular systems are



06.20.2014



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typically enclosed in either thin shell concrete domes, or metal structures. Material can be distributed in the structure by conveying to a centre feed point on top, or to an automatic stacking device, most commonly a circular belt stacker. Stackers distribute material in a 270–360° arc, depending on the reclaim method.

Reclaiming equipment options are effectively the same as for linear systems, with the same pros and cons. Again, above-ground scraper or blending bed reclaimers are among the most cost-effective systems. This system usually takes the form of a single machine commonly called a circular stacker/reclaimer.

Concrete domes are most cost effective when the lower walls are used to retain material, decreasing the enclosure cost per tonne of stored material. Since material is stacked against the lower wall, the volume of material per foot of diameter is higher. Stacking against the walls eliminates the possibility of an outer rail to support a bridge and therefore requires a counterweighted reclaimer. When blending is required a blending bed is preferred and an outer rail is required. The choice of enclosure then becomes a price contest between a larger diameter concrete and aluminium geodesic dome. The aluminium structure is now a viable option since there are no material forces against the lower walls. Steel structures are normally more limited in diameter because the economics of design favours aluminium geodesic at larger diameters. Installation cost of aluminium geodesic



structures is also low in comparison.

BRUKS® Rockwood Inc. of Atlanta supplies automatic conveying, storage, and loading equipment to industries and dry bulk cargo terminals, including linear and circular systems designed for enclosed or outdoor storage.

BRUKS®'s portfolio includes pole stackers, fixed stackers, radial stackers, circular stackers, portable rubber tire stackers, and rail mounted linear stackers; all either fixed height or luffing. Linear and circular stackers typically have counterweighted booms that luff for dust control, pile management, and to clear the reclaimer. BRUKS®'s portfolio also includes designs for portal and counterweighted linear and circular scraper type and blending bed type reclaimers.

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## Triodetic celebrates 51 years in the enclosed storage business



Triodetic, based in Arnprior, Ontario, in Canada, designs, manufactures and builds:

- ❖ architectural building roofs, walls and entrances;
- ❖ ore stockpile enclosures and tank roofs;
- ❖ interior and exterior displays and features;
- ❖ special applications: waterslides, tensile fabric;
- ❖ structures, golf bridges, foundations, towers, solar; and
- ❖ frames radar platforms etc.

In 2016, the company is celebrating an astonishing 51st year in business. It owes its success to an innovative jointing system and advanced engineering for tubular structures that allow:

- ❖ any structure, shape, span and loading;
- ❖ optimized minimum mass design;
- ❖ durable materials and finishes (galvanized and stainless steel, aluminium, composites, and factory-applied finishes); and
- ❖ fast delivery and construction in any location.

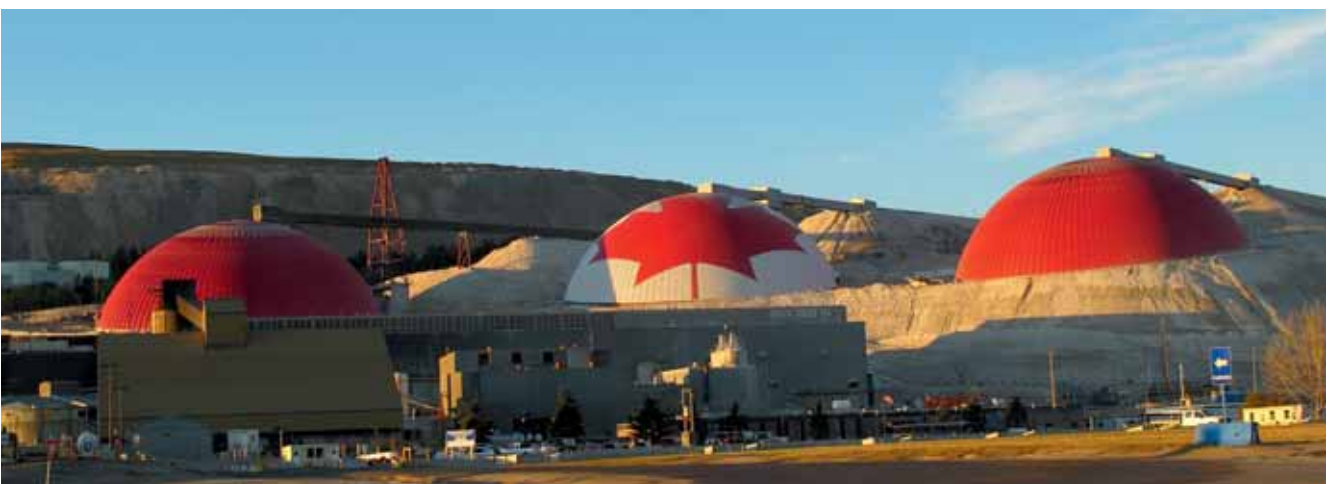
Throughout its 51 years, Triodetic has been recognized internationally for its expertise in design and construction of

space-frames, domes, shell and free-form structures with all products compliant with sustainable building requirements. It is credited with numerous industry awards and many landmark projects throughout North America, Caribbean, South America, Europe, Africa, Australia & the Pacific, China and the Middle East.

### COMPANY PROFILE

Since the 1960s, Triodetic has been an internationally recognized supplier of space frames, geodesic domes, shells, and free-form structures. Triodetic holds numerous patents and trademarks for its technology and all products are supplied in compliance with sustainable building initiatives.

All Triodetic activities are performed in compliance with OSHA (Occupational Safety and Health Administration) requirements and ISO quality management principles. Triodetic maintains exacting engineering standards and talented management to consistently ensure the design, construction and service requirements of each structure.





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## Returning to its roots: ESI Eurosilos builds the world's largest potato starch silo

*Building the world's largest potato starch silo in Karup, Denmark.*



ESI Eurosilos is a leading Dutch engineering and contracting company in storage solutions for non-free flowing bulk solids and large quantities. What started with an innovative storage silo for a Dutch potato starch manufacturer in the late 1960s, has now evolved into a range of powerful Eurosilos Solutions for customers in major industries around the globe. The company's expertise has been recognized by operators, engineering contractors, consultancy agencies and material handling engineers throughout the power industry, chemistry and agriculture.

Eurosilos is eager to work in close co-operation with customers and technology partners, so that it can develop an ideal solution for each situation.

The company is ISO 9001 and OHSAS 18001 certified and its storage solutions are compliant with ATEX and NFPA standards.

In February this year, ESI Eurosilos was awarded a contract by KMC to design, produce and install the internal machinery for the world's largest potato starch silo that is now being constructed at Karup in Denmark. This silo will have a maximum capacity of 88,500m<sup>3</sup> of starch. KMC is a Danish producer of potato starch and potato flakes. The project's execution is on a very tight schedule, as the silo has to be ready for operation before the end of this year.

ESI Eurosilos's silos are ideal for non-free flowing bulk solids and large quantities. Its highly automated silos offer maximum control in material handling, up to



100,000m<sup>3</sup>, while saving operational costs and valuable space. Totally enclosed storage systems are made possible by the application of the Dutch Eurosilos® concept, which meets the requirements of Environmental Protection Agencies worldwide.

Using covered storage for bulk commodities prevents contamination of surrounding land by dust from outside stockpiles, or polluted drain water; it also prevents deterioration of material caused by weather conditions such as frost, wind and rain. This is important to maintain quality standards; it also means that there is no need to remove excess moisture at a later stage.





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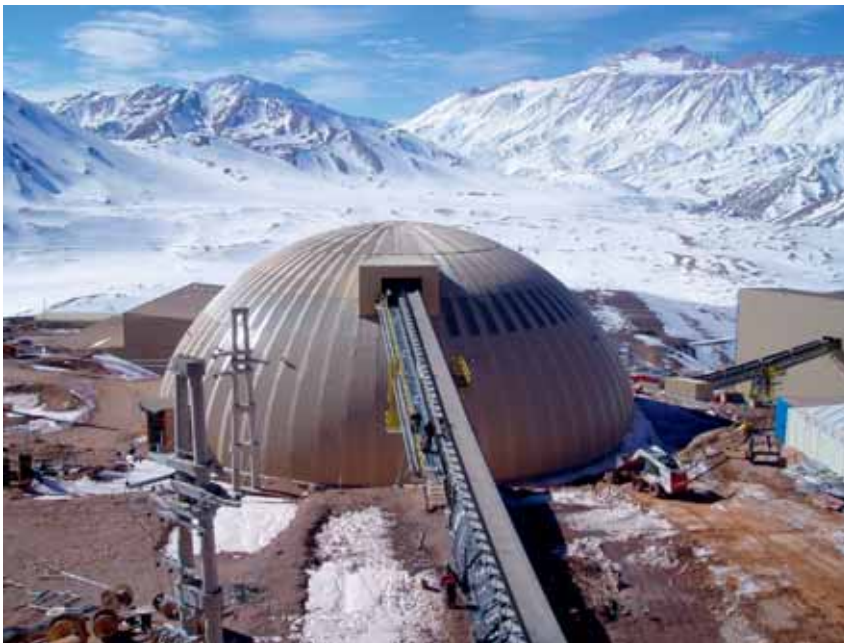
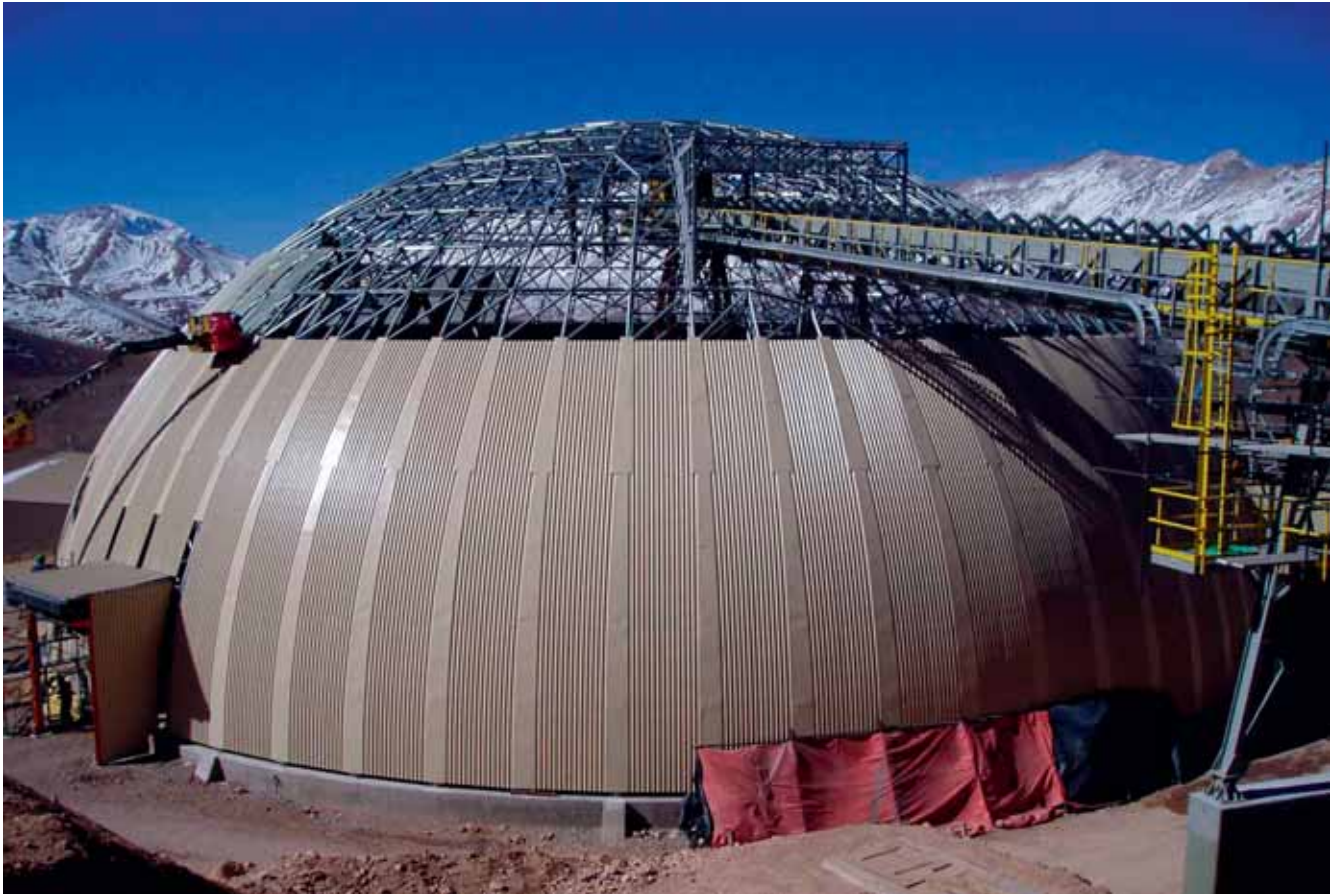
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connection removes welding or bolting from the framing and allows for single layer, double curvature structures as well as Space Frame construction with faster assembly times and reduced maintenance. Unlike some of its competitors, it provides reduced structure mass and reduced foundation, environmental benefits, environmental protection, as well as functional and affordable benefits.

#### CONCRETE STORAGE

Triodetic provides dome structures to store limestone and other cement elements like aggregate; sand, gravel, crushed stone, and slag. In order for the elements to maintain dependable properties, they must be kept in a structure that will contain their chemical composition. Triodetic domes are efficient shapes that provide enough space for the concrete elements to have air ventilation, and keep moisture build up from happening.

#### REDUCED MASS AND FOUNDATION

Not only is Triodetic a company that produces architectural storage, but it is also one of the most effective companies to provide structural engineering. Its unique Tube and Hub

#### BENEFITS OF TRIODETIC STRUCTURES

❖ **reduced structure mass and reduced foundation:** the adoption of curvature in structures is a growing trend in building design, not only for visual appeal, but because the design advantaged often effectively reduces structure mass, material and construction costs. Lightweight frames and structural shells can be more economical than traditional beam-column arrangements. A dome roof for instance may require only a third of the steel mass of conventional members. Curvature in structural members and cladding materials has become very economical. Lower mass structures require smaller foundations. The tangible outcome is lower costs and faster construction.



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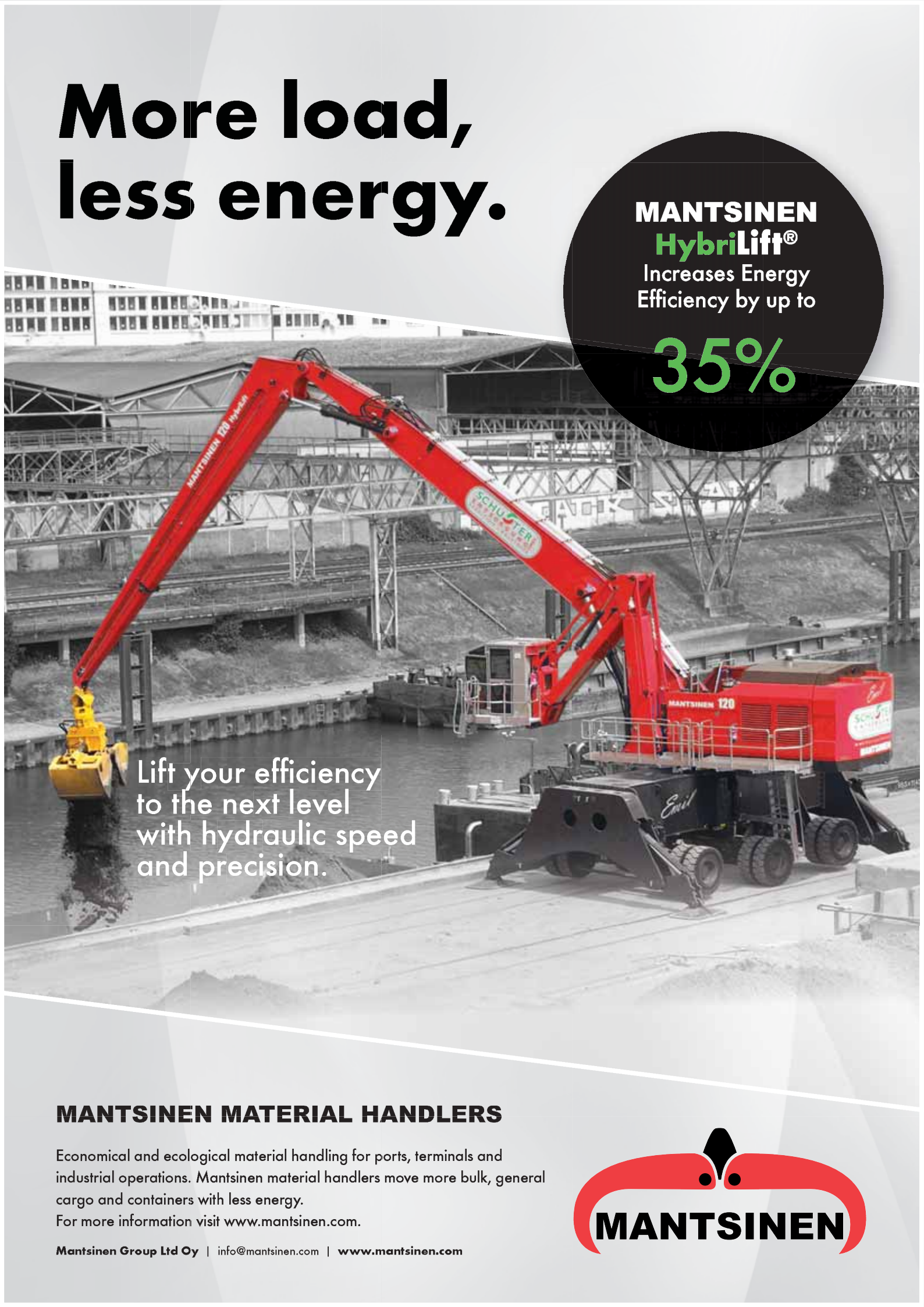
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- ❖ **environmental protection:** the control of emissions (e.g. dust, odours, seepage) is becoming mandatory in many countries as more stringent environmental legislation is imposed on many industries. Triodetic provides enclosures to minimize dust, odour and other emissions from granular stockpiles, (e.g. conical, longitudinal, and concentric) and processing facilities (e.g. thickeners, water and waste water tanks and basins).
- ❖ **functional and affordable:** Triodetic assists in evaluation structural arrangements for enclosures, buildings and roofs to best address all physical, financial and time constraints. The company aims to provide cost-effective and state-of-the-art solutions that not only perform as desired for the service life specified, but also are safe to construct and are completed on time and within budget. Triodetic has extensive structural design and construction experience which is available to customers at all stages of project evaluation and final operation.
- ❖ **durable materials and protective finishes:** Triodetic frames are manufactured in materials appropriate for the desired service life in most industrial environments. Framing can be fabricated from galvanized steel and aluminium and other non-metallic materials, plus a range of protective coating solutions are available.

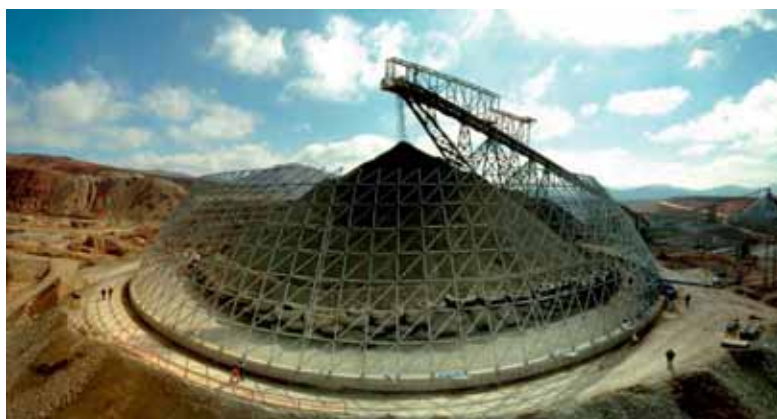


#### ENVIRONMENTAL BENEFITS

Triodetic recognizes the value and importance of sustainable building design. Its commitment to the company where it operates and those where its structures are built and used is demonstrated in its design, fabrication processes, products supplied and installation techniques employed.

The following summary identifies the environmental advantages offered by Triodetic technology:

- ❖ 60-90% recycled raw materials and 100% recycling of scrap and waste;
- ❖ up to 60% less material consumption through advanced structural design;
- ❖ reduced energy consumption in fabrication;
- ❖ non-polluting fabrication;
- ❖ up to 50% reduction in freight;
- ❖ reduced project duration
- ❖ minimal disruption to building site;
- ❖ work provided for local unemployed;
- ❖ reduced site hazards;
- ❖ no site painting; and
- ❖ 100% product re-use.





# Ring the changes

containerized transport of  
bulk commodities

## Codelco and Chilean port revolutionize mining logistics

CODELCO, the largest copper producing company in the world has revolutionized mining logistics of its copper concentrate. It has re-engineered bulk handling, using a completely sealed zero material loss system from the mine to the hatch of the ship at Puerto Angamos in Mejillones, Chile.

The traditional method of bulk exporting of copper concentrate uses trucking, warehousing and ship loading conveyor systems, all of which result in small material loss. To complement its operations, Codelco started from the beginning and designed a whole new system that completely encloses the material from the pit to the hatch of the ship.

### CHILE: HOME TO WORLD'S GREENEST BULK PORT

The new process, engineered with the support of equipment suppliers, encloses the expensive copper concentrate in a sealed container. The equipment, specially designed for the project in co-operation with suppliers uses some innovative new ideas.

The copper concentrate is sealed in a purposely designed box with a lockable lid. Once in place at the mine, the only time the lid is removed is by the lid lifter on the revolving spreader prior to rotation at the bottom of the ship's hatch. During the tipping process, the hatch is sealed with the final piece of clever

design, with a hatch based dust suppression system catching any rising dust.

The traditional method of bulk export involves multiple transfer points, from truck to train, to warehouse then by conveyor to a bulk loader into the ship's hold. At each of these transfer points, material is lost. When your commodity is selling for more than \$3,000 per tonne, the financial loss can add up to millions of dollars.

### THE NEW CONTAINERIZED BULK HANDLING PROCESS

Traditional bulk loading requires large amount of investment in engineering, design and construction, implementation and maintenance. Some bulk terminals cost more than \$100 million to set up.

The new innovative way CODELCO, in conjunction with Puerto Angamos, implemented a way to handle its copper concentrate was through the containerized bulk handling (CBH) system, sealing the material in a container from pit to ship. In the mining industry, this is the first of its kind in the Americas. The copper concentrate is loaded and sealed into special ISO twenty foot containers at the mine; it is then transported to the port's yard, stored like any other container and then loaded right



into the vessel's hatch with existing terminal equipment. The only new equipment is the purpose-designed revolver from RAM Spreaders.

The CBH process is simple and effective, efficient and most of all, clean and friendly to the environment at a very low cost. The copper is not exposed to the environment, even when it is released at the bottom of the vessel's hatch by the revolver spreader.

“Codelco wanted to be ahead of the curve environmentally and re-engineered the export process using the CBH system in Puerto Angamos. Our export is the cleanest in the world and we are not losing any of our valuable material “



**DUST — MONEY BLOWING IN THE WIND**

Dust is created when energy is added to dry bulk materials. The CBH process is engineered to prevent energy from impacting the material at all stages of the process. Energy which creates dust can be the wind on a train wagon, the wheels of a tipper truck or a bulk loader dropping material from a great height and displacing air in

the ship's hold.

Being clever in design, using the CBH process allows lids to seal the container at the mine and is kept sealed during transport and storage. The container is only opened after being lifted at

**Traditional versus containerized bulk handling system**

**Traditional**



*Open wagons pose risks to contamination and loss of product during the transportation process to port.*

*Dust cloud created from open stockpiles.*

*Posing a threat to environmental impact.*

**Containerized bulk handling**



*Fill at mine/bulk facility.*

*Seal container for transporting. No contamination.*

*Containers stored at port. No stockpiles.*

*Loaded into ship's hatch. No risk to health or environment.*

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the port before it is rotated into the bottom of the ship's hatch. Revolving the container at the bottom of the hatch adds minimal energy and creates minimal dust. The team has added a further environmental protection step, by sealing the ship's hatch to stop any escape of fugitive dust emissions by a hatch-mounted dust suppression system.

#### FLEXIBLE, FAST AND LOW CAPITAL COST

Most of the equipment required to successfully implement a containerized bulk handling system already exist at the mine site and port. This includes forklifts, reach stackers and cranes. For ports that do not have their own mobile or ship-to-shore cranes, the revolver spreader also comes in a lightweight version, so it can be used on ship cranes.

In the case of Puerto Angamos, it has two of the most advanced harbor mobile cranes in the port industry. The only major additional equipment required in this operation, is the revolver spreader and the containers. This is a fraction of the investment made in traditional bulk terminals.

The whole solution can be up and running within six to nine months from the time a decision is made. The system has also seen fast load rates with other projects using the revolver spreader for iron ore, loading at 2,000tph (tonnes per hour) per revolver. It is very cost effective indeed.

#### MISTING SYSTEM

Puerto Angamos has implemented a dust suppression barrier, fitted around the ship's hatch as an additional measure, to protect the environment and the port personnel's health at the terminal



while loading the vessel. The system completely covers the entire top of the hatch with a fine fog. As any fugitive dust particles rise up from the hatch, they collide with the heavier water particles, then join together and fall to the bottom of the hatch.

Likewise, the misting system does not have any adverse effect on the product been handled. This is a key and critical feature in terminals where dust control is of the utmost importance at the pier where other operations are being handled at the same time. In most cases, the outside observer will not be aware bulk is being loaded. On the financial side, in conventional operations without a misting system, the loss of product over a length of time is significant.

*"Codelco and Puerto Angamos treat the safety of the community & its employees with the highest priority. We chose to implement the CBH system with a hatch based misting system to provide best practice environmentally"*

#### OTHER BENEFITS OF CONTAINERIZED BULK HANDLING

A very important service Puerto Angamos can provide by using this containerized bulk handling solution is the ability to perform copper blending right in the hold of the vessel, creating a clean blend of copper concentrate.

As some batches of containers may come into the terminal with various degrees of moisture, they can be segregated at the yard by a colour tag or numbering system and then loaded into the vessel as desired, to meet customer requirements.

It is interesting to note that this system is fully mobile. The port operator or the mine company can move the operation (revolver spreaders and containers) to any other site within or outside its borders. Investment is therefore not lost when operations end, it is enhanced and protected. Along the same



lines, this process may creatively add significant new cargo traffic and revenues to the port. Puerto Angamos has implemented two 20-foot revolver spreaders with containers having a payload of 30 tonnes. With two mobile harbor cranes, 1,100tph is achievable. All of this possible, using existing infrastructure and equipment.

In summary, containerized bulk handling system is a low capital investment, with a faster time to market and virtually no dust from the lid and misting system, and it caters for most types of bulk products.

In essence, CODELCO has changed the way the bulk industry works in the Americas. It has set up a benchmark to a more efficient and environmentally friendly way of safely transporting, storing and loading copper concentrate into the vessels. **DCi**



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“Other manufacturers provide equipment. E-Crane provides SOLUTIONS”

OUTREACH	26.4 m / 86.5 ft
LIFT CAPACITY	19 t / 20.9 T
APPLICATION	Barge Unloading
POWER SOURCE	200 kW / 300 hp electric motor

# the ORIGINAL balanced crane

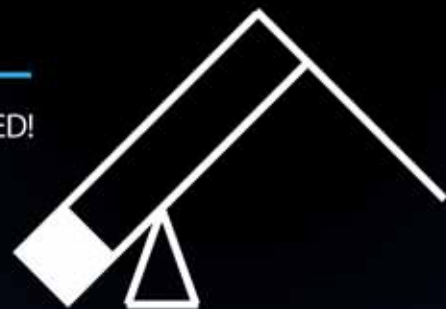
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# Grain handling equipment

reaping the  
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high quality  
products

*In 2014, a 1500 Series/Model  
11264 E-Crane was commissioned  
for CHS in Zarate, Argentina.*

## More E-Cranes handling grain in South America

For the past few years, more and more E-Cranes have been popping up in South America to handle grain. A few months ago, we discussed a several E-Crane installations taking place in 2014 and 2015. All of these machines are successfully up and running,

and a new E-Crane installation is set to take place in the autumn of 2015.

The E-Crane is ideal for bulk handling applications that require heavy-duty production cycles and has proven to be a top





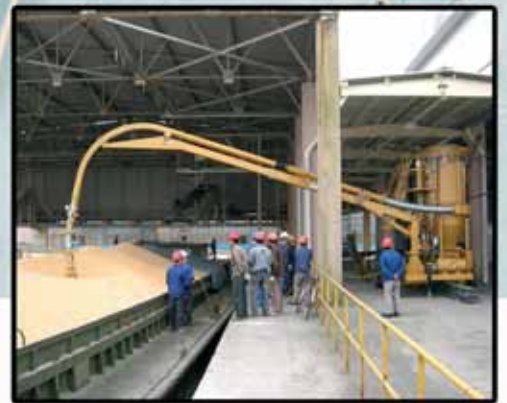


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solution for grain handling operations involving barge unloading, shiploading, and midstream transfer.

#### CASE STUDY: CHS

<b>Type</b>	1500 Series/Model 11264 PD-E
<b>Location</b>	Zarate, Argentina
<b>Application</b>	Barge unloading
<b>Material</b>	Grain, soybeans
<b>Mount</b>	Pedestal
<b>Duty cycle capacity</b>	16.5 metric tonnes/18.2 US tons
<b>Reach</b>	26.4m/86.5ft
<b>Attachment</b>	14.0m <sup>3</sup> /18.3yd <sup>3</sup> hydraulic clamshell grab
<b>Power source</b>	200kW/300hp electric motor

In 2014, a 1500 Series/Model 11264 E-Crane was commissioned for CHS in Zarate, Argentina. CHS is a leading company in agribusiness with locations all over the world. The E-Crane is dock mounted, and is used to unload soybeans and grain from both Mississippi and Paraná sized barges at the CHS facility in Zarate. The E-Crane transfers the material from the barges to a hopper and conveyor system located on the dock using a 14.0m<sup>3</sup> (18.3yd<sup>3</sup>) hydraulic clamshell bucket.

This was a greenfield project, with all new equipment, in order to expand operations at CHS. CHS contacted E-Crane back in 2013, looking for a solution to offload grain barges. E-Crane engineers worked closely with CHS to determine the best





*The two UABL E-Cranes in situ.*

possible setup. E-Crane service technicians were on site in Argentina for the E-Crane installation, training, and commission to make sure that operations were successful.

#### CASE STUDY: UABL

<b>Type</b>	700 Series/Models 4264 PD-E, 4290 PD-E
<b>Location</b>	Pueblo Esther, Argentina
<b>Application</b>	Barge unloading
<b>Material</b>	Grain, soyabeans
<b>Mount</b>	Barge
<b>Duty cycle capacity</b>	5.5 metric tonnes/6.0 US tons
<b>Reach</b>	4264: 26.4m/86.5ft 4290: 29.0m/95.0ft
<b>Attachment</b>	4.5m <sup>3</sup> /5.9yd <sup>3</sup> hydraulic clamshell grab (x2)
<b>Power source</b>	110kW/150hp electric motor

Also in 2014, UABL realized the benefits of the E-Crane for grain handling with the installation of two 700 Series E-Cranes. UABL, a subsidiary of Ultrapetrol, owns and operates river terminals and provides barge and terminal services across South America. In 2014, the order was placed for two E-Cranes mounted together on a single barge. Both E-Cranes work together to unload grain from Paraná sized barges into two separate hoppers also located on the barge. The hopper outputs the material onto a conveyor/ship-loader system which transfers the material into Handymax sized vessels on the other side of the crane barge.

The E-Crane solution is ideal for situations that require floating equipment such as this. The E-Crane's balanced design is based on a parallelogram style boom which provides a direct mechanical connection between the counterweight and the load. Because of this, the E-Crane remains in a near perfectly balanced

state throughout its entire working range. This results in significant energy savings, allowing gravity to work in the E-Crane's favour, but also makes the E-Crane ideal for mounting on a floating barge. Because the E-Crane is balanced, the movement of the E-Crane causes very minimal listing and

*The barge-mounted E-Cranes are doing sterling service for UABL in Argentina.*





movement of the barge.

A barge-mounted E-Crane is beneficial because it floats up and down along with the material barges as the water elevation changes. This means that the cycle of digging material out of the barge is never affected by water fluctuation.

The E-Cranes were installed on schedule in 2014, and commissioning and training took place in the summer of 2015. Commissioning took place several months after installation due to delays with other grain handling equipment for the barge. The E-Cranes are now up and running successfully!

#### E-CRANE CONTINUES TO EXPAND IN SOUTH AMERICA

In 2015, an order was placed for another E-Crane to offload grain barges near Santa Fe, Argentina. The E-Crane is a 1500 Series/Model 10290 with 29.0m (95ft) outreach and 14.0 metric tonnes (15.4 US tons) duty cycle capacity. The project will be similar to the previous CHS installation and the E-Crane will be used to offload grain from Paraná sized barges into a hopper on shore. E-Crane has proven itself as the ideal solution for grain

handling and hopes to continue to expand throughout South America.

#### ABOUT E-CRANE

Specifically designed for barge unloading processes, anything from coal to limestone to fertilizer to grain to scrap steel can be handled with the E-Crane. The E-Crane is a truly versatile machine in that it can easily switch between commodities and still offer the high production required at many ports and industrial facilities. Built for 24/7 duty cycle operation, E-Cranes have unprecedented life cycles, high efficiency, and low maintenance costs.

The standard E-Crane product line consists of several series of balanced hydraulic cranes (Equilibrium Cranes): 700 Series, 1000 Series, 1500 Series, 2000 Series, 3000 Series, and 5000 Series. E-Cranes provide longer outreach and higher duty cycle capacities than typical material handlers. Outreach ranges from 24.8 to 50.0 metres (82 to 165 feet) and lift capacity ranges from 5.5 up to 60 metric tonnes (6 to 66 US tons).

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- With a growing range of bespoke solutions for the handling of difficult dry bulk materials, our product range includes the unique 'cascade' concept, dust-controlled conveyor transfer points and dust-controlled hoppers.
- With over 600 reference installations operating worldwide, with applications in ship, silo, road, rail & tanker loading, the company's key to success is its proven ability to provide a well-engineered solution with professional and committed support.
- Winners of prestigious Queens Awards for Environmental Achievement, Export Achievement, Enterprise in International Trades and many more.

#### Contact Cleveland Cascades Ltd

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

E-mail: [enquiries@clevelandcascades.co.uk](mailto:enquiries@clevelandcascades.co.uk) | Website: [www.clevelandcascades.co.uk](http://www.clevelandcascades.co.uk)



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## Buhler offers complete grain handling service from A to Z



All over the world grain is counted as one of our most valuable staple foodstuffs, writes Meike Kettler, Team Manager Marketing Communications, Business Area Grain Logistics, Buhler GmbH. In the light of a growing world population and climate change, safeguarding this raw material is one of the challenges of our times. In addition to the monitoring of cultivation itself, handling after the harvest is also a critical factor in relation to quality assurance and the reduction of raw material losses.

For Buhler's Grain Logistics business unit, everything starts once crops have been harvested. After the combine harvesters have done their job, grains and oilseeds are brought to silo plants for storage. Two of the fundamental elements of initial storage are cleaning and, in many cases, drying of the grains prior to storage. In an age in which the demand for grain is steadily increasing, Buhler's expertise in the field of post-harvest technology has become essential.

Whether the need is for grain silo installations, or a grain terminal, Buhler Grain Logistics provides a complete service portfolio from consultation to customer service. The scope of delivery includes cleaning and grading systems developed in-house, energy-saving continuous flow dryers developed especially for use with grains, as well as a full range of conveying and dedusting systems.

With its knowledge and services, Grain Logistics sees to it that post-harvest losses, which are still occurring at an immense rate globally, are further reduced and that fewer commodities go to waste. Ship and vessel loading and unloading installations supplied by Buhler enable shipping from large-scale silo plants in the growing regions to consumers worldwide. Technology for

temporary storage or direct loading onto barge, rail or truck for onward transport is also supplied by Grain Logistics. Grain Logistics offers services from A to Z — from planning,



*Buhler's Eco Dry for drying grains and other crops.*



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*Buhler grain storage facilities.*



construction, manufacturing, delivery and start-up through to on-site training of personnel and dependable customer services. Together with Buhler's other business units, Grain Logistics provides Buhler customers with solutions for the entire value-added chain — from the field to the finished food product.

#### **STAYING COMPETITIVE**

Countless tonnes of agricultural commodities are transshipped every day around the world — and the requirements to be met by the grain collection facilities and cargo handling terminals involved are growing. The overriding priority here is to use the latest technology to prepare every last grain of cereal for storage and processing as gently and economically as possible. These processes require considerable specialist knowledge of the systems and products. Grain Logistics offers all the process stages from a single source, meaning the complete package, namely the planning, development, construction and maintenance of anything from individual components to complete systems — anywhere in the world. Working closely together with the customer, Buhler develops, plans and constructs customer-specific plants from standardized components. With regular servicing and genuine spare parts from Grain Logistics Customer Service, the plants can offer decades of reliable service.

#### **RECENT PROJECTS**

Especially in the South East Asian market Buhler has completed several big projects for the handling and processing of raw and parboiled paddy. Two of the company's largest-ever contracts for rice processing globally are Merry Rice in Thailand and Capital

Rice in Bangladesh. This emphasizes its success and position as the first choice technology partner for rice processing and reprocessing. The paddy processes require considerable specialist knowledge of the systems and products.

Working closely together with the customer, Buhler develops, plans and constructs customer-specific plants from standardized components.

#### **COMMITTED TO SUSTAINABILITY**

Every day, billions of people use Buhler technologies to satisfy their basic needs for food, mobility, or communication. With its industrial process technologies and solutions, the company makes a significant contribution to feeding the world's population while focusing on food safety and security. Around 65% of the wheat harvested worldwide is processed into flour on Buhler mills. The company's contribution to the global production and processing of rice, pasta, chocolate, and breakfast cereals is equally substantial.

Furthermore, Buhler is a leading solution provider of die casting, wet grinding, and surface coating technologies, with a focus on applications in the automotive, optics, electronics, printing, packaging, and glass technologies. The solutions provided to these industries are characterized by high energy efficiency and sustainable mobility. As a leading technology group, Buhler invests up to 5% of its turnover in research and development every year. Buhler is proud of its Swiss roots, with 10,600 employees at some 140 sites generating sales of CHF 2.3 billion. As a family-owned company, Buhler feels particularly committed to sustainability.

It may have your name on it but can you guarantee what's in it?...



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## Ardelt and Kocks – strong partners in handling agro bulk



When it comes to uniting with a strong partner for handling goods and bulk cargo, Kocks and Ardelt have always been pioneers in innovation and providing customized solutions to address individual customer needs. Kocks and Ardelt are members of Kranunion, an association of three leading crane manufacturers specialized in lifting, transporting and handling heavy loads for railways, ports, shipyards and steel mills. Kranunion operates worldwide and has representation in North and South America, Asia and Europe. Kranunion stands for high quality professional German engineering.

During the last five years, Ardelt has delivered more than seventy slewing cranes to twenty-two different countries. The delivered cranes cover a wide range of applications and are geographically spread from the polar region in the north to the far reaches of South America. Ardelt offers premium cranes that meet the demands of the great variances in site conditions as well as the different local requirements and regulations.

Ardelt continuously utilizes its vast expertise and knowledge to introduce and improve technologies for handling bulk cargo. Ardelt Grab Filling Optimization, the improved Anti-Sway Control System as well as many other application-specific (or customer-specific) systems are only a few examples of Ardelt's innovative capabilities.

Louis Hagel GmbH und Co. KG of Hamburg, Germany, as the oldest operator in the port of Hamburg, has recently added a new stationary Tukan manufactured by Ardelt; the crane was operational just in time for the 2014/15 season.

Louis Hagel is a specialist in handling fertilizers, salts and other bulk goods. To serve its operations, the new double jib level luffing crane has a maximum outreach of 36 metres and the

maximum lifting capacity is 12 tonnes. In terms of serviceability, the Tukan is equipped with the latest technology: touch-screen monitors, supervision cameras and semi-automatic operation allowing the crane operator to not only work more easily, but also ensure greater safety.

Since the year 2000, slewing cranes from Ardelt have been equipped with an Anti-Sway Control System; this system is subject to continuous development and improvement. The advantages of this system are based on an advanced control process that makes optimal fine positioning during manual operation possible. As a result, a smooth transition from manual operation to semi-automatic movement is possible, even with load sway.

Louis Hagel reaps the rewards from this system; the manual control used over the ship merges smoothly and without any delay into the automatic operation for unloading the bulk goods into hopper. Due to the rapid and efficient bulk handling into the covered conveyor belts, Louis Hagel minimizes the environmental impact, such as humidity, on the handled goods while at the same time achieving maximum handling throughput.

The patented, and in-house developed, Grab Filling Optimization Technology is used in all Kocks and Ardelt bulk handling systems. Cutouts (stoppage) due to grab overload are a thing of the past — with Ardelt grab technology, handling productivity is maximized and the grab capacity is utilized to the maximum values relating to the various material properties.

In Chile another testament to the quality of Ardelt double jib level luffing cranes is in operation, a Tukan 750 that is used for handling agro bulk.

The customer, Puerto Panul S.A., is responsible for the

development, maintenance and commercial operation of the docking side of the north terminal in San Antonio port; the agricultural imports that are handled at this port are mainly wheat, corn and soya. The current Tukan replaces an old and smaller crane (from another manufacturer), that collapsed during an earthquake in 2010. The Tukan does not only meet the technical and operational requirements of the port, but also fulfils the very demanding standards for earthquake-prone regions.

This special Tukan had to be installed in a rather challenging location, a 'finger pier'. The peculiarity of the location had called for special logistics and assembly solutions, further examples of Ardel's position as a true custom-solutions provider. For the assembly work to be carried out in San Antonio, the crane parts were delivered in big sub-assemblies. The erection of these crane parts was done with the support of a giant lattice boom crane; the erection was completed in only seven days and the port remained fully operational during the whole process.

Kocks and Ardel deliver highly professional cranes for bulk handling all over the world. All of the products are centred around ingenious technical concepts, which are steadily developed. Thinking one step ahead on the customer's behalf has made it a world market leader; it always seeks to provide the best possible life-cycle costs, maximum operating benefits and lowest environmental impact.



## TUKAN

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## Metso increases focus on equipment for the grain market

*Continuous barge unloader from Metso.*



Major bulk handling equipment provider offers a wide range of equipment for the bulk industry. Included in these products is a range of grain handling equipment, used for the loading and unloading of vessels (barges/ships) at ports and terminals with capacities of approximately 120,000BPH (bushels per hour) (~3,000tph [tonnes per hour]) loading/unloading rates. This equipment is used for the unloading barges or ships to transfer grain to smaller vessels or to storage facilities, usually silos, or the loading barges or ships from larger vessels to smaller ones or from storage silos to the vessel.

The major grains handled by Metso equipment include corn, wheat and soy. However, the company has also handled cotton seed, rice, brewers grain, animal feed and even coffee beans and peanuts. Metso works with most of the major grain companies.

Metso manufactures its equipment at a specific set of pre-qualified shops in North and South America, Europe, China, Australia and various other countries, all of which are Metso-approved facilities.

Specific pieces of equipment offered include:

- ❖ continuous barge unloaders

- ❖ grab bucket unloaders
- ❖ equilibrated crane unloaders
- ❖ barge/shiploaders
- ❖ portal reclaimers
- ❖ circular reclaimers
- ❖ barge/ship haul systems

Additionally, Metso offers the following equipment for use at processing facilities such as:

- ❖ material flingers (for stockpiling or for vessel loading)
- ❖ en masse conveying (Redler conveyors)
- ❖ rail car movers (Nolan HCM™, SCAMP)
- ❖ rotary bin dischargers

Typically the equipment used for unloading and loading in grain handling is stationary and is assisted by the use of a haulage system to move the vessels to facilitate the unloading or loading process. Metso has additionally supplied numerous grab unloaders, as well as, ship and barge loaders that travel along a dock, in lieu of using a vessel haulage system.

As a general rule, Metso uses advanced systems to power its equipment, which utilize AC motors integrated with variable



## PIONEERING SPIRIT

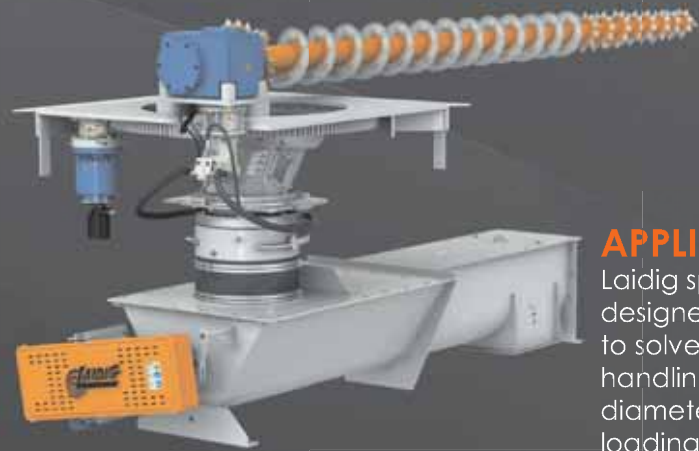
With over 50 years of pioneering innovations, Laidig is recognized world-wide as a leader in the bulk storage and material handling industry. Laidig is continually involved in cutting-edge development to offer customers the best solutions for their storage and reclaim needs.

## EXPERTS IN

# MATERIAL HANDLING SOLUTIONS

### FULLY AUTOMATED TURNKEY SYSTEMS

Laidig's turnkey storage and reclaim systems offer superior material handling performance and dependability in the harshest environments.

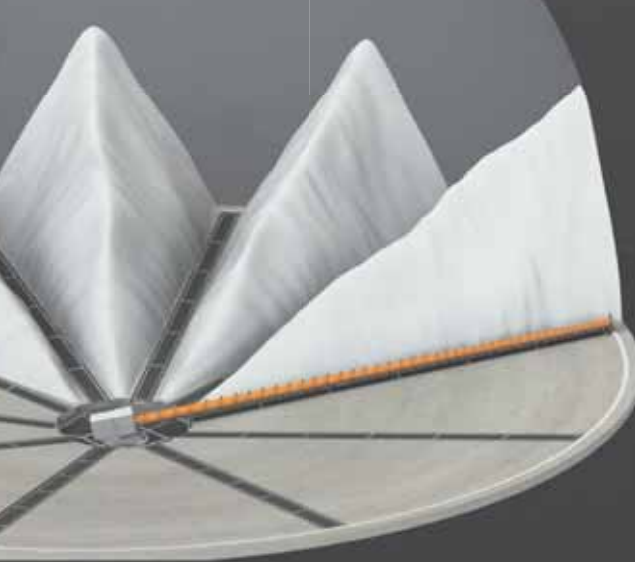


### APPLICATION SPECIFIC

Laidig specializes in custom-designed and engineered systems to solve all of your material handling needs, including large diameter applications to assist in loading ships at port facilities.

### EXCEPTIONAL ENGINEERING

Laidig's systems are engineered to provide **completely automated, near-total clean out**, while maintaining first-in-first-out (FIFO) material distribution.





frequency drive controllers. It can, however, provide any power system required as it customizes its equipment to meet specific customer needs.

All of Metso's equipment can be customized to suit very specific customer requirements. Even its standard product offerings can be customized, although these are more generally sized and standardized for a cost-effective solution.

#### FULL SERVICE OFFERING

Grain is grown and harvested in many regions around the world. It is then transported by rail, barge or truck depending on location and cost of transport. Inland river shipping terminals, bulk transfer terminals, and import/export terminals provide a viable means of moving the bounty to market. Metso is prominent in each of these locations, as well as at customer processing facilities where its line of standard equipment such as en masse conveyors, rail car movers, rotary bin dischargers and flingers are utilized.

#### RE-FOCUSING

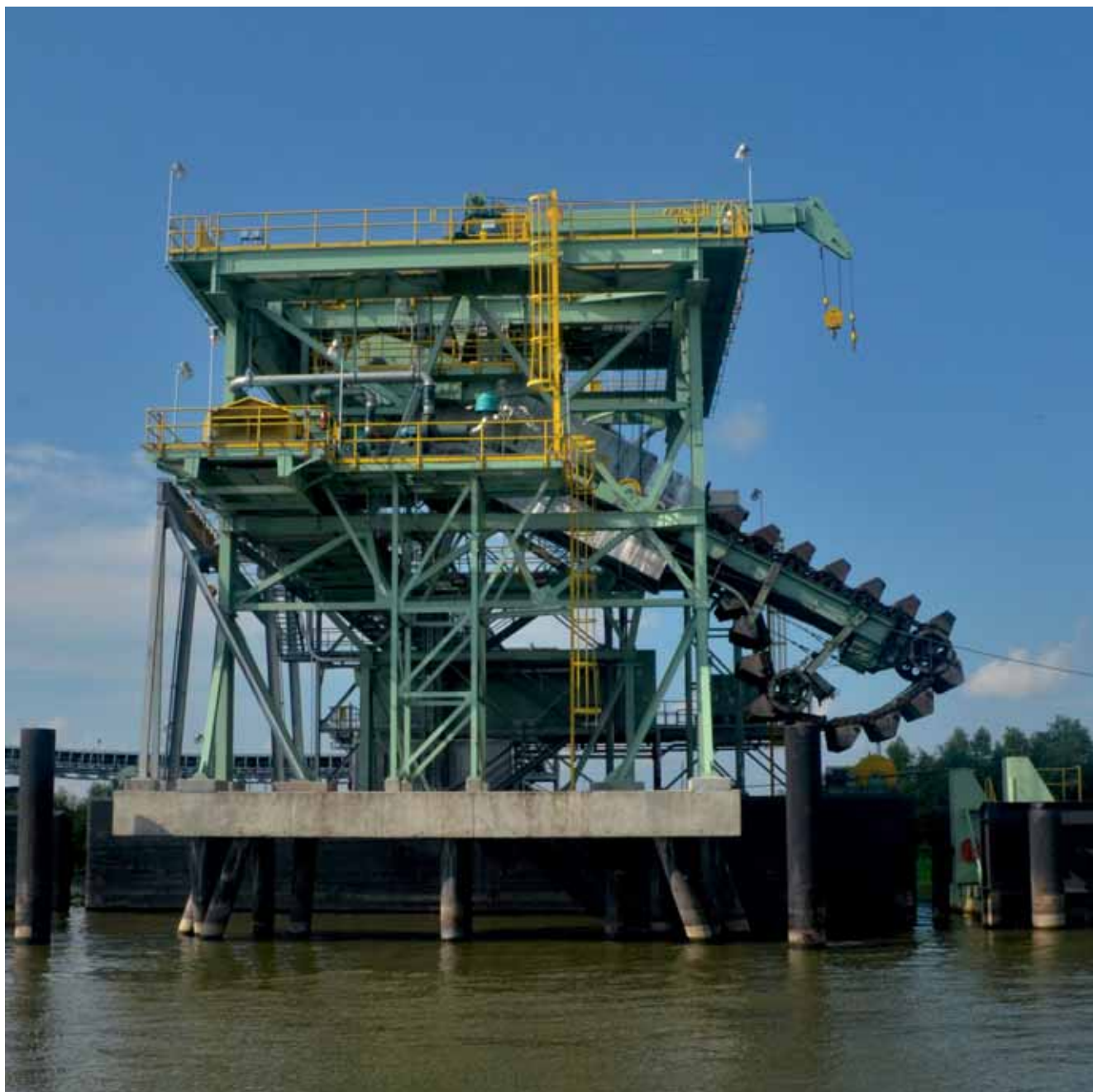
Metso has been supplying equipment in the grain industry for

many years. However, its primary area of equipment supply has been in mining, moving ore and minerals, as well as supporting coal-fired electric power. Adapting to the global market changes, Metso is now re-emphasizing its focus on other industries, such as the grain industry. The company continually invests in R&D and equipment, and this investment includes grain handling products. Metso is currently putting effort into re-inventing equipment to address different markets.

#### STAYING COMPETITIVE

Metso takes great pride in providing cost-effective, high quality, easily maintainable, safe equipment for its customers. It continues to build on these fundamentals through its renewal and R&D efforts that allow them to provide optimal solutions for customers.

For the future, Metso will continue to maintain its current customer base and to grow that base through increased market share by renewing and developing its technologies that provide optimal solutions for the many industries it serves. Metso is re-inventing its bulk materials handling marketing direction to adapt to the global changes. It is not getting older — just better!





# MOTRIDAL

Bulk Handling Equipment & Plants

## Motridal SpA

BULK HANDLING EQUIPMENT & PLANTS

Motridal SpA is a leading International Company specializing in the design and construction of machines and systems for bulk material handling.

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[motridal@motridal.com](mailto:motridal@motridal.com)



## Technical comparison of shiploading systems for the grain industry

### NEUERO'S KIKO SYSTEM

The final step in the grain exporting process is the loading of the ships. The grain normally comes from a storage area using various conveyors to reach the shiploader. Using gravity, the shiploader loads the grain inside the vessel's hatch.

Dust problems can occur at every transfer point from one conveyor to the other. The height difference is a key factor. The further the grain falls, the higher the speed of the grain falling\* ('up to about 10m in height, at which point the speed is constant). This speed makes the air separate the dust from the grain flow after 1m/s. The dust and the grain have different sink velocities, which is the reason for the separation. At slow velocities (~1m/s) dust and grain remain together.\*

### LOADING SYSTEMS WITHOUT DUST SUPPRESSION

These systems were very popular in the past because their low equipment weight with respective low costs. The main objective was to fill the hatch. The problem with the difference of weight between weighed and really dispatched product was also neglected. The grain speed reached the maximum at the end and was used to throw it under the hatch.

In the past environmental protection was not an issue as today. The dust emission depends on the volume, wind, location and loaded products. Examples of these systems include vertical or inclined falling spouts, loading rotating spoons and jet slingers.

### LOADING SYSTEMS WITH DUST SUPPRESSION

Today, there is a requirement for dust-control measures, not only in developed countries but worldwide. These are needed to protect the environment, and have resulted in developments in loading bellows with 'skirts' and 'chokers'. These systems have worked worldwide with varying degrees of success. They were accepted because, when they were introduced, they were considered state-of-the-art, and they can work well depending on the type of product being loaded, its dust content and constant flow.

The problem is that it is necessary to get a constant speed, specifically at the end of the loading pipe when product falls from a height of 20m. To achieve more efficient dust suppression, the product speed must be slowed down at output. Most of the systems can handle some products but not all, especially with flow and product variation. The chokers tried to slow the material with more or less complicated systems to control the flow. The result was not always positive.

In our understanding two systems today are providing the required low dust emission with respective speed reduction; the cascade system and the controlled flow head. Both of these systems reduce the grain speed in order to avoid dust generation. Both also reduce the breakage of the product result of the low speed.

## Loading systems without dust suppression

*Jet slinger.*



*With vertical or inclined falling spout.*

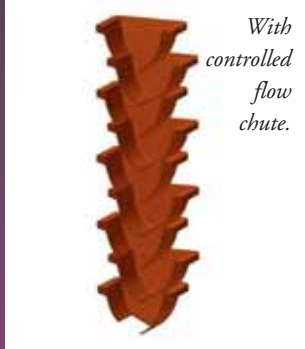


*With loading rotating spoon.*

# Loading systems with dust suppression



*Loading bellows with choker.*



*With controlled flow chute.*



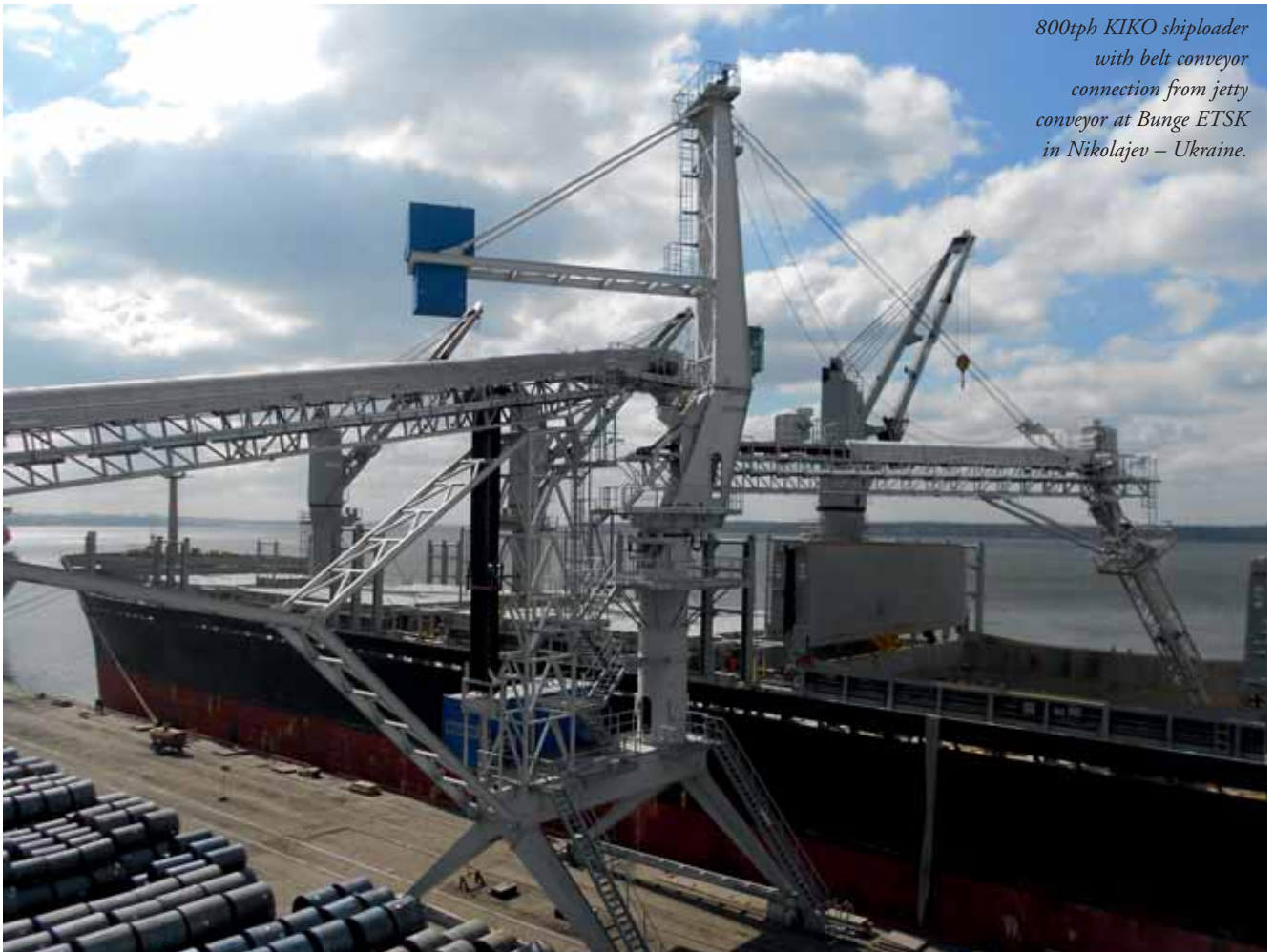
*Loading bellows with skirts.*



*With controlled flow dust suppression head.*

NEUERO, the manufacturer and developer of controlled flow head perfected it allying the Kick In Kick Out (KIKO) movements. KIKO movement provides following extra advantages: besides excellent dust suppression, low material

breakage and less wear it also combined with the kick in kick out movements to allow a bigger working range equivalent to having a horizontal movement. The horizontal movement is a must in fixed loading tower(s) and a good point to have in mobile ones,

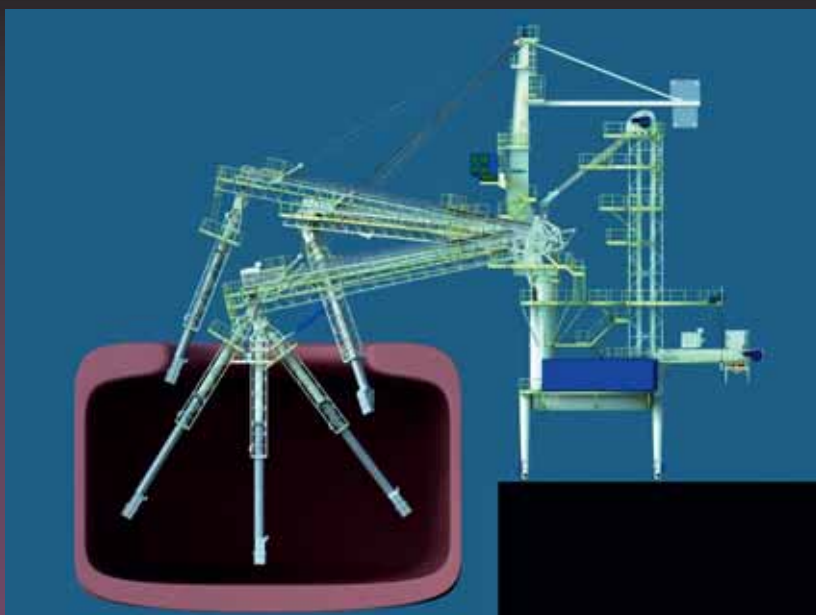


*800tph KIKO shiploader with belt conveyor connection from jetty conveyor at Bunge ETSK in Nikolajev – Ukraine.*

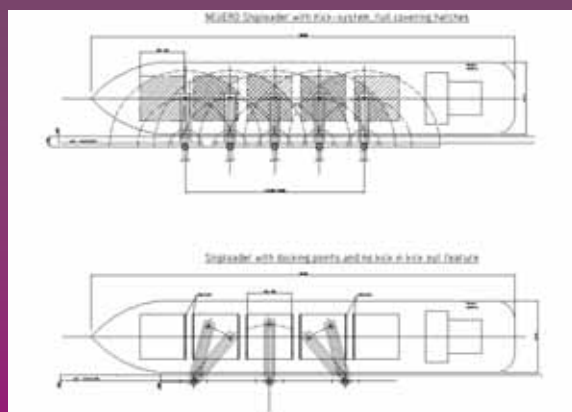
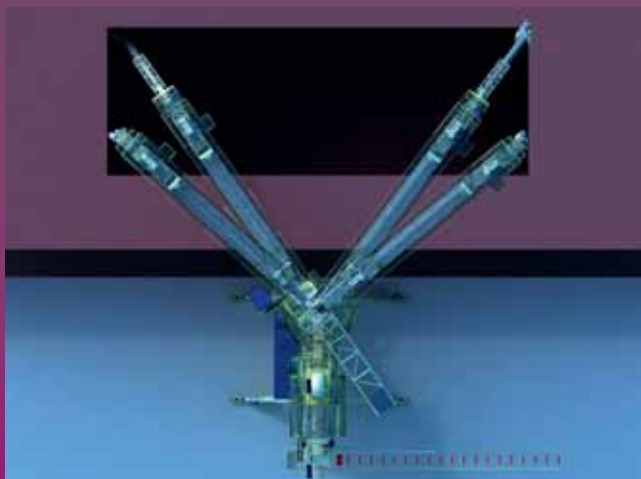


# Working area

*SIDE VIEW (right): the kick in kick out movement with the vertical telescopic arm reaches the complete hatch, also under the hatch.*



*TOP VIEW (below): the slewing movement covers alongside the hatch.*



especially if additional equipment is located on the same jetty. Another advantage depends on the ship's hatch shape. The inclined movement helps to more efficiently fill the hatch. An example of the working area is depicted.

*800tph KIKO shiploader with bucket elevator transfer from jetty conveyor used by ADM Minmetal in Constanta — Romania.*

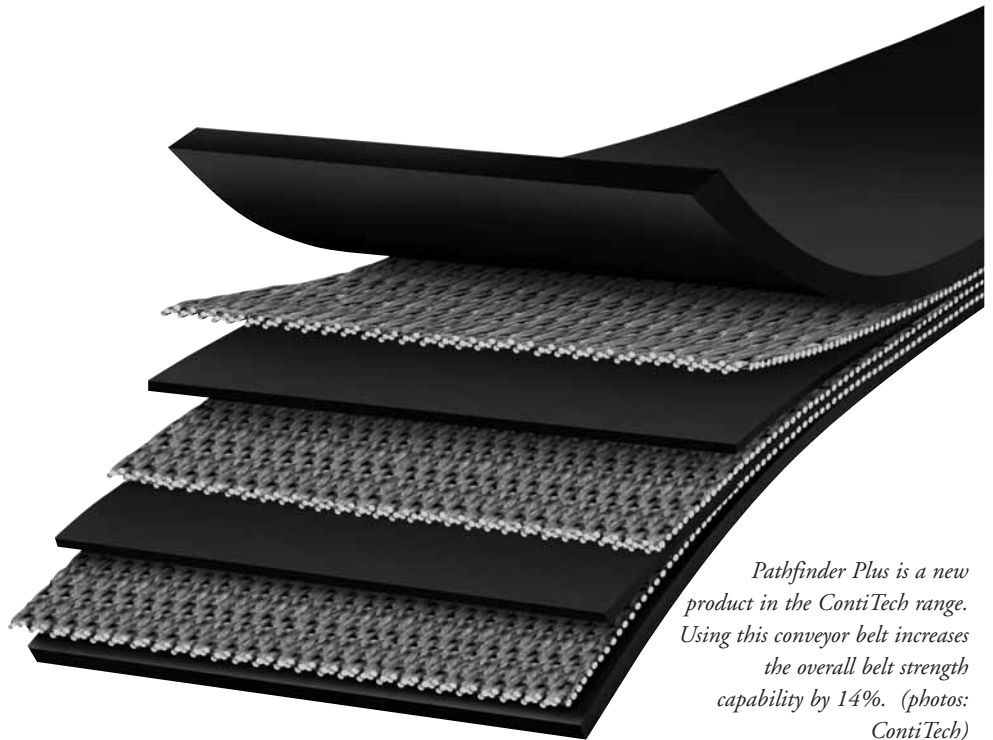
## Withstanding harsh conditions: ContiTech's broad solutions for grain handling

- ❖ PVGE products offer wide range of service in grain elevator applications
- ❖ New Pathfinder Plus increases conveying capacity
- ❖ Grain Handler is engineered for use where a static conductive belt is needed

ContiTech's conveyor belts are designed from the inside out to endure the everyday working abuse for coal, aggregate, wood, hard rock and agricultural products. When it comes to grain handling ContiTech offers a very dedicated product portfolio for this application. "As manufacturer of textile and steel cord conveyor belts, special products, and service material, we are geared to satisfying the requirements of mining, machine and plant engineering as well as agricultural sectors like grain handling," explains Dr. Michael Hofmann, Head of Advanced Belting Solutions at ContiTech Conveyor Belt Group.

"Our PVGE products offer an economic alternative to rubber grain elevator belts. Manufactured by ContiTech's wholly owned subsidiary company, Belt Concepts of America Inc., located in Spring Hope, North Carolina, our PVGE products offer a wide range of service in grain elevator applications," explains Francisco Hidalgo, Commercial Manager for Lightweight Conveyor Belts. The all-polyester, interwoven carcass provides very low stretch as well as excellent fastener retention and bolt-holding capability to fasten the grain buckets to the belt. The belt is available in a full range of working tensions from 20KN per metre for light duty applications all the way up to 130KN per metre for elevators

*The PVGE products offer an economic alternative to rubber grain elevator belts. They are used in a wide variety of grain handling applications and are available in both black and white colours depending on the customer's needs.*



*Pathfinder Plus is a new product in the ContiTech range. Using this conveyor belt increases the overall belt strength capability by 14%. (photos: ContiTech)*

lifting heavier loads to higher elevations. "Our PVGE compound is specially designed to provide oil resistance and low temperature capability, for example  $-29^{\circ}\text{C}$ , as well as static conductivity and flame retardant properties. They are used in a wide variety of grain handling applications and are available in both black and white colours depending on the customer's needs. Additionally, the very strong interwoven carcass results in long belt life", Hidalgo adds.

The material is used for the newly developed PVGE 600 & PVGE 750 grain elevator conveyor belts. The high tensile strength belts are made with unique hybrid warp yarns and are designed to lift heavier grain loads or typical loads to higher elevations. The durability of the all-polyester interwoven carcass allows for exceptional bolt holding capability and fastener retention, as well as the flexibility to be used on systems with smaller pulley diameters. The PVGE compound delivers oil resistance and low temperature capabilities while meeting and exceeding safety standards.

### REINFORCED BELTS FOR GRAIN PROCESSING

Depending on the application, textile conveyor belts feature various cover stock properties and a single- or multi-ply textile tensile member. These long-lived products are made for diverse conveying tasks in machine and plant construction as well as many other industries like grain handling applications.

Pathfinder Plus, for example, is a new product in the ContiTech range. The reinforced fabric belt is designed to stand up to the unique operating conditions of grain handling facilities. "Using the Pathfinder Plus belt increases the overall belt strength capability by 14%," notes Hidalgo. "Exceptionally low electrical resistance and the maximum degree of oil resistance provide operational safety and long life. Furthermore, low belt elongation minimizes downtime spent re-splicing grain belts." The fabric belt is specifically made to resist potentially damaging effects of crushed and whole soybeans, oily grains and mineral oil dust suppressant sprays. "Our Pathfinder® Plus allows costumers to



increase bucket projection by a minimum of 10%, which translates into great conveying capacity.” The conveyor belt is based on two compounds: Pathfinder Arctic and Pathfinder Supreme. Both compounds are designed especially for the grain industry where oily grains and controlled mineral or vegetable oil dust suppressive sprays come in contact with the belt. Supreme covers provide superior oil resistance to the potentially damaging effects of crushed and whole soybeans, oily grains and mineral oil dust suppressant sprays.

#### **STRONG PRODUCT RANGE FOR THE NAFTA MARKET**

ContiTech also focuses on conveyor belts for industrial applications — e.g. in cement plants, paper mills, the food processing industry, and storage warehouses — as well as special-purpose belts for agricultural machinery. “Selected compounds make our grain belts for example fire retardant and appropriate for elevation of oily conveying materials,” explains Christoph Seeger, Market Director Americas. The Grain Handler is engineered for use in the grain elevator industry or where a static conductive belt is needed. Different Impressions help with the transport of grain. For example, the company offers the Diamond Top Impression that is ideal for conveying products with mild oil content or a slight amount of oil in different carcass constructions. Furthermore, ContiTech offers a comprehensive range of belt profiles. For optimum performance even under the toughest of conditions all profiles are integrally moulded into the belt using rubber cleat extrusion.

Apart from these specialized products the portfolio includes white conveyor belts that have been specially engineered for the transportation of foodstuff. In this branch of industry abrasion wear on black conveyor belt surfaces must be avoided at all costs

## Company information

Continental develops intelligent technologies for transporting people and their goods. As a reliable partner, the international automotive supplier, tyre manufacturer, and industrial partner provides sustainable, safe, comfortable, individual, and affordable solutions. In 2014, the corporation generated sales of approximately €34.5 billion with its five divisions, Chassis & Safety, Interior, Powertrain, Tire, and ContiTech. Continental currently employs approximately 200,000 people in 53 countries.

The ContiTech division is one of the world's leading suppliers of technical elastomer products and is a specialist in plastics technology. It develops and produces functional parts, components, and systems for machine and plant engineering, mining, the automotive industry, and other important industries. Together with US company Veyance Technologies Inc., which was acquired at the beginning of 2015, ContiTech generated sales of approximately €5.4 billion (pro forma basis) in 2014 and currently employs approximately 41,000 people in 34 countries worldwide.

because it can cause material in transit to become discoloured and impure. For this reason, foodstuff conveyors are made from white nitrile (NBR) or styrene-butadiene rubber (SBR) and comply with international standards and norms governing the foodstuffs industry.

## *RC Inspection and OTI have agreed to a full operational affiliation with immediate effect*



**OIL TEST INTERNACIONAL**

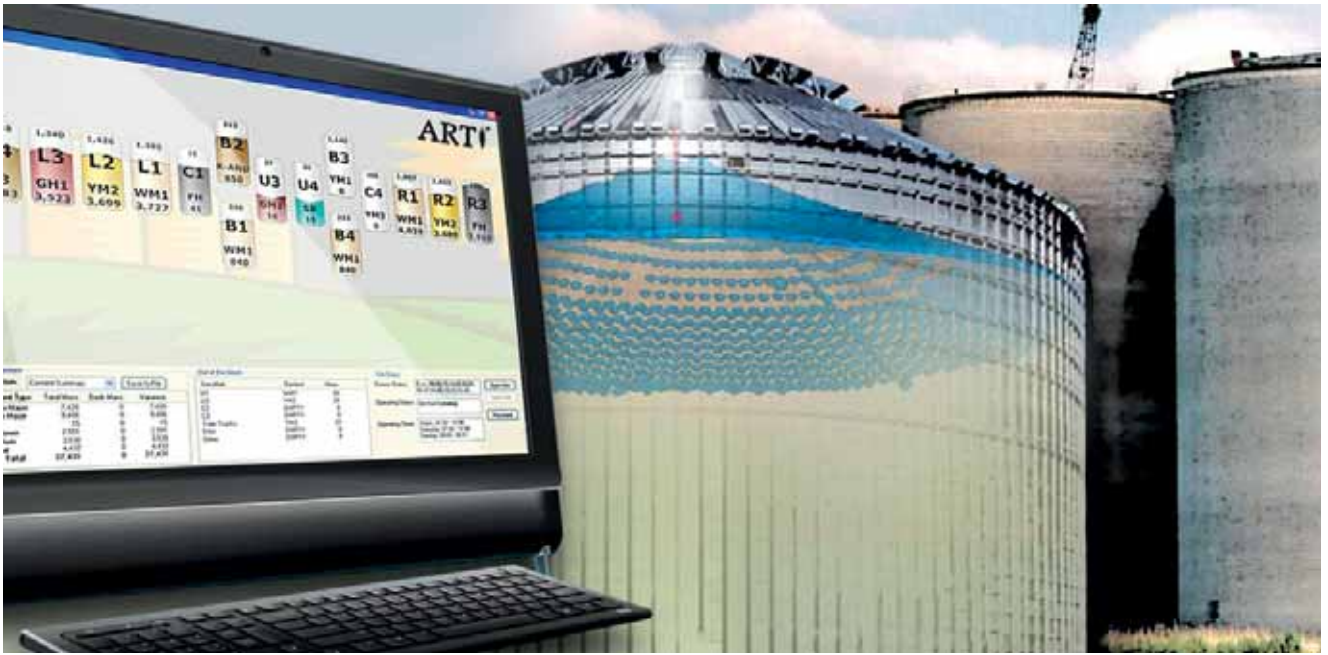


**RC INSPECTION**

Both leading providers of sampling, inspection and analytical services in the fields of ores, metals / minerals, concentrates, solid fuels, biomass commodities, fertilizers, oil and agricultural products. All rendered services are carried out under accreditation ensuring the customer full quality assurance.

“Our goal is to continue delivering innovative, high quality services in our current markets and at the same time make sure that our customers on both sides can still rely on the excellent personal relationships. All customers will be dealing with the same people and can depend on the same high quality services as befits a modern inspection company”.

## Risk and inventory management solutions from Ronin



Ronin Grain Management Solutions was established as a company in 2002 based on the industry need for improved risk management and inventory management solutions.

Ronin engaged within the South African grain handling Industry providing analytical instrumentation catering towards safe storage and quality grading. Ronin soon established OEM (original equipment manufacturer) relationships with various international manufacturers for providing instrumentation to measure moisture, protein, fat, fibre and other constituents in cereal grains and flour. To this day Ronin plays an important role in terms of their national moisture calibration rollout programme which happens twice yearly accommodating summer and winter crop calibration validation.

Amidst a time of deregulation of the cereal and oilseed control boards the need for improved day to day management of stock positions became more evident. Diverse trading methodologies were introduced into the newly formed free market which challenged any accountant to balance physical stock in the silo with what is happening on the book. During this time the ART® System was developed to be the first Inventory Management System to balance physical stock positions to transactional book systems on a daily basis.

The ART® System utilizes a range of in-bin laser rangefinders which is connected over an Ethernet network to the silo office. The ART® Software sends requests for measurements or scans, if it is a laser scanning device, to calculate the occupied volume inside the silo. Full historic reference in terms of date and time of measurements are kept inside the ART® Software for each bin on site. ART® Head Office software, installed in the silo office or remotely somewhere else, correlates and interrogates the ART Software as well as the clients' transactional database. All grading information like moisture, foreign materials, grading factors, bulk density and others are then applied by the ART® Head Office software on a weighted average basis per silo bin. The result being a daily stock position between what is in the silo and what is on the books.

Today the ART® System is valued as one of the most important components at a bulk handling facility. The ART® System provides the needed information for production, logistics and traders to accommodate the time relevant decisions and

product availability on site. Recent years saw the development of single and multi-axis 3D scanning lasers which can function as single units inside the silo bin to multiple scanning units making easy work of assessing big warehouses and flat stores.

Ronin AIMS® software makes it possible to create the storage vessel in a 3D environment and to incorporate the intricacies of silo and warehouse design. Bin or warehouse shape, angular floors, discharge chutes, sweeping augers, temperature monitoring cables, partitioning walls, virtual segregation walls and the content bounds are all taken into account.

By introducing a different laser class to the Artemis® laser scanner, Ronin unlocked a magnitude of industrial applications with the Artemis 300® series laser scanner. The Artemis 300® laser scanner provides open air; long range measurements on products with very low reflect ability.

Ronin have an installed base of more than 2,000 measuring units which is used in grain silos, sugar warehouses, soybean meal plants, ammonium nitrate sheds, open air iron ore stacker, chrome stacker and more.

Ronin Inventory Management System, IMS, situated in Richards Bay South Africa utilizes the Ronin propriety technology on a daily basis inside the South African port and mining environment to conduct moment in time audits, stock quantity and quality verifications on bulk commodities which is stored in silos, open warehouses and bunker bays as well as key-side laydown areas and stacker and/or reclaimer yards.

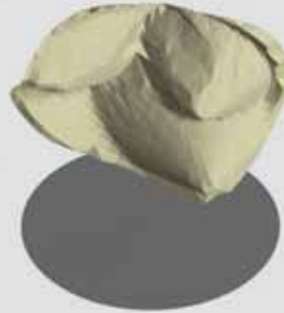
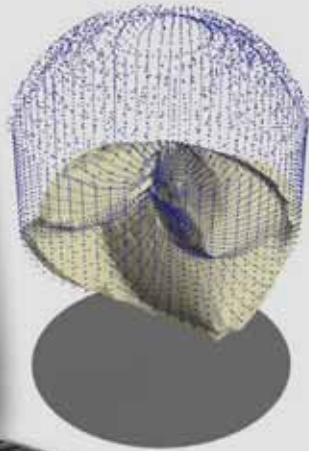
Ronin runs a continuous development and accreditation programme in terms of hardware and software to enhance its clients' experience as well as remote support functionality as well as to open up the more challenging environments of bulk handling.

International distribution and establishing distributor agreements are core initiatives which are currently being focused on in various territories.

### LATEST INTERNATIONAL SUCCESS STORY

CIMBRIA A/S, Denmark incorporated the ART® system with Artemis® 41 series laser scanners in their most recent project in Egypt. The ART system will provide daily knowledge on food security.





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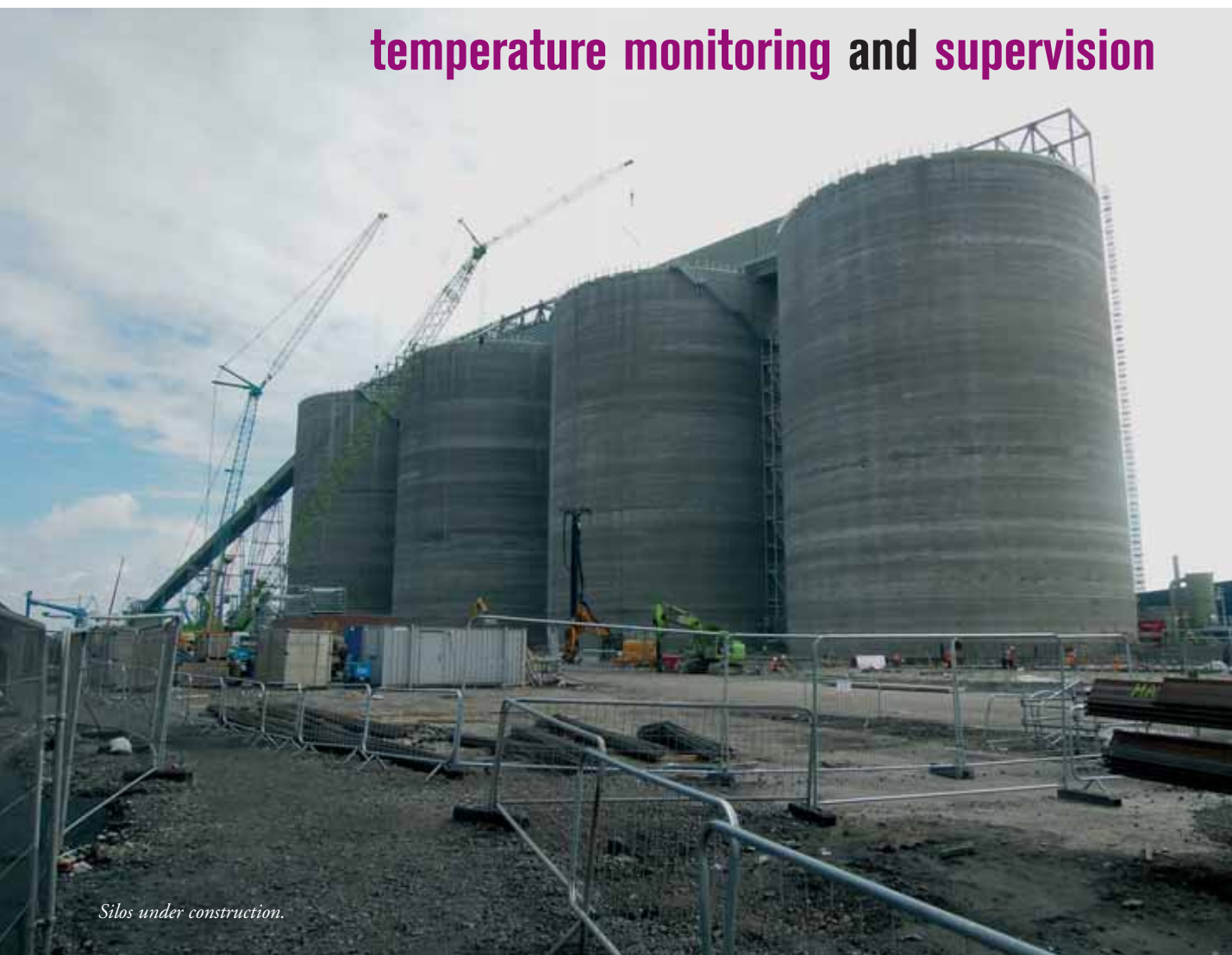
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# Wood pellet storage

## temperature monitoring and supervision



*Silos under construction.*

Countless small-scale heating systems worldwide are equipped with pellet furnaces. More and more medium- and large-scale heating systems for industrial plants, or bio power stations, are also entering the market.

For one of the largest pellet storage plants in England, Agromatic was contracted to supply temperature monitoring systems for the wood pellet storage silos. So far, eight concrete bins with a cylindrical height of about 57m and a diameter of 37.5m have been erected, and further extensions over the next five years are in planning.

The storage capacity of all bins is approximately 4.4 million square metres, which is equal to 5mt (million tonnes) of material. Each bin is equipped with Agromatic's most rugged monitoring cables, and the latest temperature monitoring technology to meet all relevant safety requirements.

In 2008 Agromatic started engineering a new generation of temperature monitoring cables, equipped with special software and designed to meet all requirements particular to the pellet storage industry. Since then, all the systems have been tested and proven effective, and are used in the following applications:

- ❖ wood pellet silos (pellet size 5/6mm diameter, for private usage);
- ❖ industrial pellet size 30/40mm and 50mm diameter; and
- ❖ wood chips and wood chunks.

Wood pellets make high demands on the robustness of the monitoring cables:

- ❖ rough and edged material with high abrasiveness;
- ❖ high product humidity (chunky wood); and
- ❖ large bridging tendency when emptying bins, which results in high loads.

The silos are enormous, and can take extremely large loads.

### TEMPERATURE MONITORING IN WOOD PELLET SILO

Risks during storage may occur due to self ignition of imported smoldering particles, possibly caused by wear of machinery (friction, abrasion). Low fumigation of pellets after production also carries large risk potential.

It is nearly impossible to detect and extinguish all possible smoldering nests.

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It is therefore essential to have effective temperature monitoring of stored pellets, in the interests of safety. Reliable detection of a temperature rise is monitored by special software, which detects the smallest temperature changes in order to prevent possible danger, or initialize safety provisions.



*View on bin ceiling: supports for bearing pressure.*

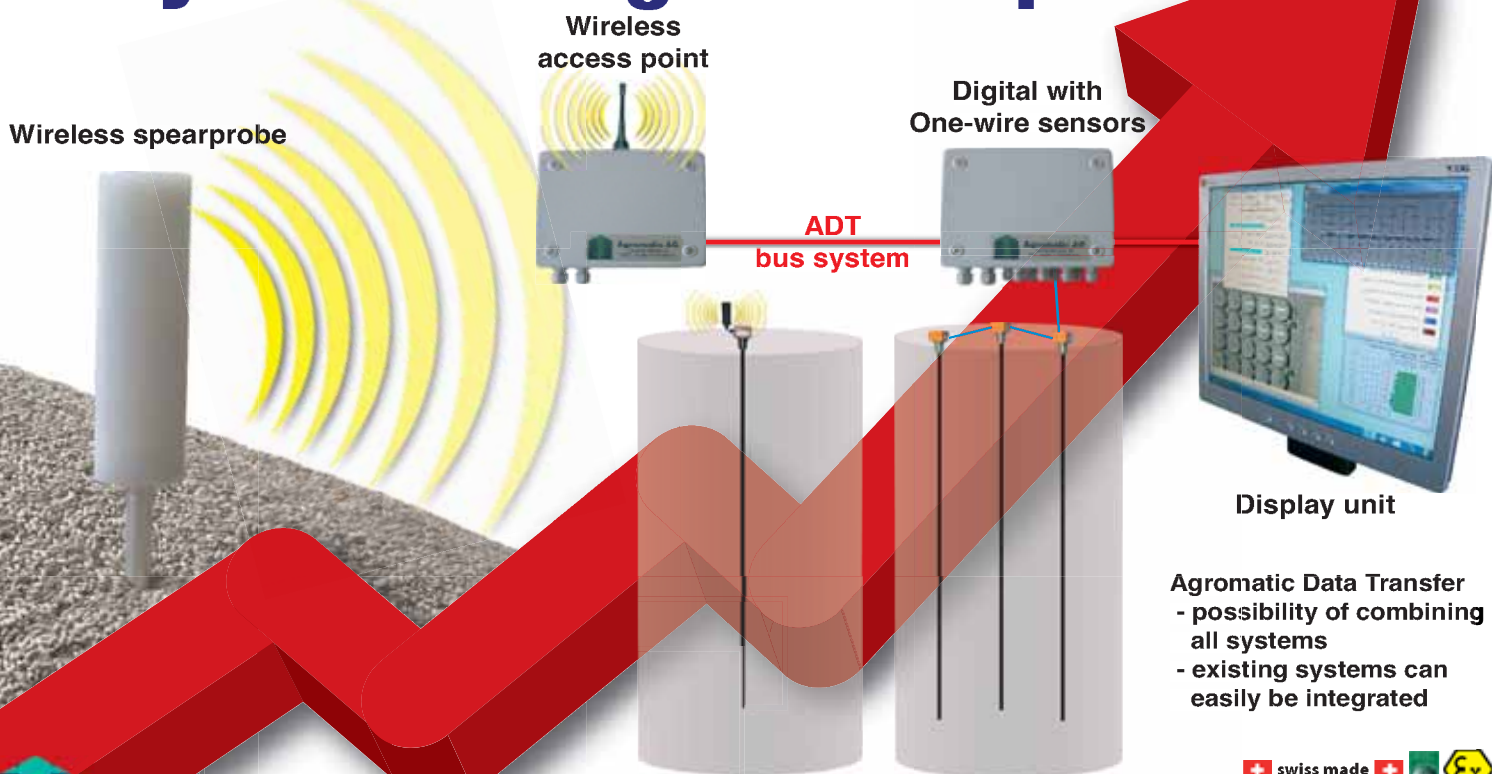
**TEMPERATURE MONITORING CABLES AND ITS SENSORS**

Specially designed monitoring cables are different in essential points from cables that have successfully used in the grain industry for many years:

- ❖ higher tensile strength;

- ❖ higher admissible forming pressure; and
- ❖ higher mechanical strength by reducing abrasion and frictional wear.

# „SAFE YOUR GRAIN“ by monitoring the temperature



**Agromatic Data Transfer**  
- possibility of combining all systems  
- existing systems can easily be integrated



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**SUSPENSION BOX BD90**

This particular suspension box offers the possibility of reinforcement into the bin ceiling, when cables are subsequently installed. Integration into the bin ceiling is possible using an additional flange for basic fixing.

For both alternatives, monitoring cables can easily be installed into the silo on the bin ceiling.

It is therefore no longer necessary for anyone to enter the bin silo. The suspension boxes are approved and ensure separation of Ex-zones. Usage is possible within the building or on the silo roof. Protection class corresponds to IP67.



*Pellet silo.*



*Suspension box.*

**MONITORING CABLE GKD/BD90**

Basically, the temperature monitoring cable is supplied with an integrated two-wire sensor technology. The system guarantees that the high standard demands of the application are fulfilled and that all safety requirements are met, according to relevant Ex-regulations. The example shows the complete execution of a flush suspension box solution BD90/BD90P.

If it is not possible to allocate the connection cables into an existing site, Agromatic offers a wireless data communication system. The wireless transmitter can be mounted on the measuring cable suspension head at any required location (inside or outside buildings).



*Monitoring cable GKD DB90.*

computer provides the basis for control and programming. Exchange and processing of stored and related product values are possible through individual interfaces.

Ideally, and for security reasons, it's strategically best to use the Agromatic software and control unit primarily. From there an integrated safety programme

allows for a fast automatic and manual access to critical bins.

The registration of primary safety data should never be processed through third data stream for data evaluation in order to completely exclude the possibility of communication errors. **DC:**



*Wireless probe with integrated transmitter.*

**WIRELESS TRANSMITTER**

**Sensors**

Depending on the commodity and its volume, the number of measuring points and sensors are defined accordingly. Best possible scanning is achieved in a radius of 3.5m, and sensors are best placed each 3.5m in height. When storing chunky wood or fresh and humid material, it is important not to exceed a distance of 3m.

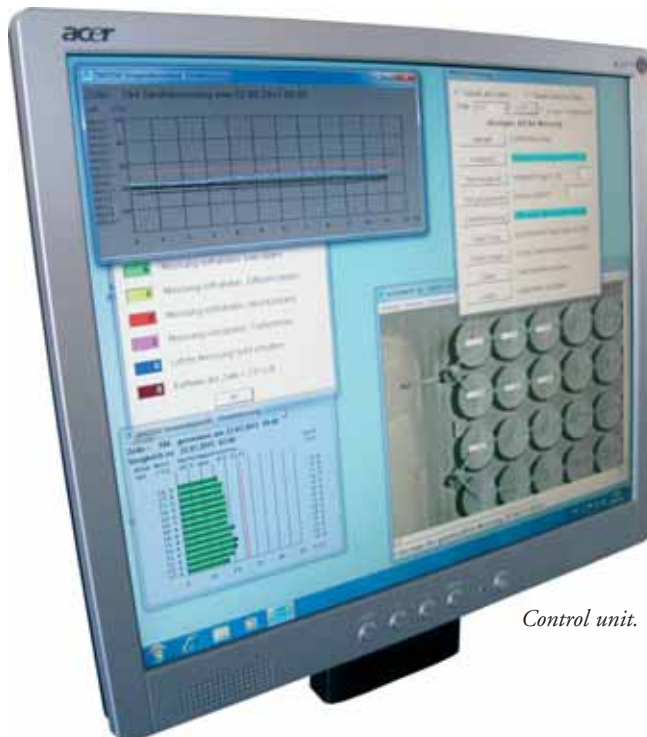
The measured values of the digital sensors, each of which has

its own address, can be read wirelessly or by bus. At the same time, values are transmitted directly to the monitoring unit.

A powerful industrial



*Wireless probe: temperature monitoring cable with integrated transmitter.*



*Control unit.*





# U-ONE-SAFETY

## easy implementation of safety functions



'Functional safety' is the key phrase when safety questions are raised concerning accident prevention on machines and systems. When developing its products, Johannes Huebner Giessen complies strictly with the requirements of the European Machinery Directive 2006/42/EC as well as the associated standards, which are also increasingly becoming recognized international standards. The Machinery Directive regulates a uniform level of protection as well as requiring CE marking and a Declaration of Conformity to comply with the relevant standards such as DIN EN ISO 12100:2010 (Safety of machinery).

With the U-ONE-SAFETY Johannes Huebner Giessen has developed the next generation of the U-ONE encoder system; in doing so it supports machine builders and system operators in preventing workplace accidents.

Nowadays, safety measures are more and more required in the dry bulk industry. Safety is ensured by Johannes Huebner Giessen's U-ONE-SAFETY.

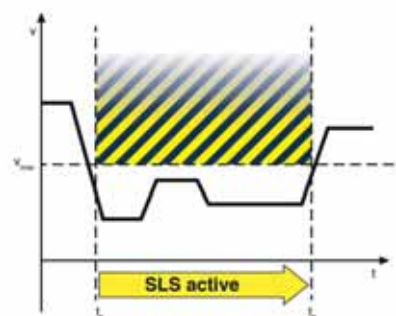
### ACCIDENT PREVENTION THANKS TO SAFETY FUNCTIONS

Safety-critical situations invariably arise when it is necessary to physically intervene while the machine is running to rectify faults during setting up procedures or performing test runs. The speed and position-changing movements of a machine part can pose a risk to safety from which operating personnel need to be protected. The easiest solution at first glance is to simply isolate

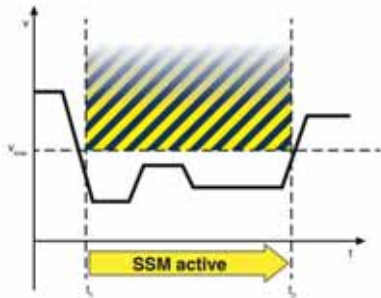
the drive power of the respective motors, meaning shutdown the system. However, this is not always the best or the most economic solution. Productivity stands and falls with the number of hours a system is in operation. Moreover, larger systems have long, drawn-out initialization procedures when restarting, so that more valuable time is wasted. If it is not an option to shut down the machine, hazardous movements must be performed at safely-limited speeds, rotational speeds or positions, often in inching mode or in combination with simultaneously operating an enabling switch. Activating the safety functions presented below ensures risks to safety are reduced permanently.

### FUNCTIONS TO SAFELY MONITOR MOVEMENT

❖ **SLS – Safely-Limited Speed:** the SLS function prevents the motor exceeding defined speed limits. Monitored functions that exceed the



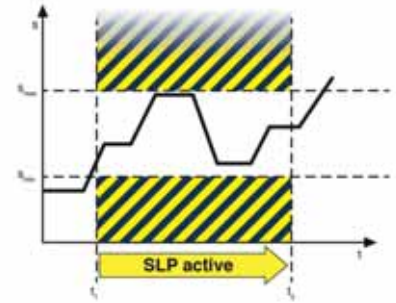
SLS - Safely-Limited Speed  
Sicher begrenzte Geschwindigkeit



SSM - Safe Speed Monitor  
Sichere Geschwindigkeitsartassung



SDI - Safe Direction  
Sichere Bewegungsrichtung



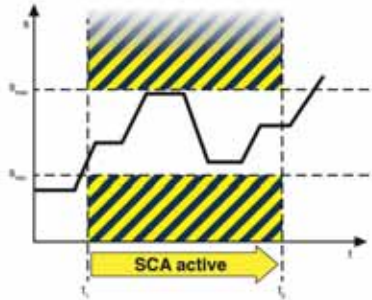
SLP - Safety-Limited Position  
Sicher begrenzte Position

limit value are detected and the drive is shut down safely.

- ❖ **SSM – Safe Speed Monitor:** the SSM function supplies a reliable output signal to indicate if the motor speed is below a defined limit value. The output signal is reset if the limit value is exceeded; no other reaction follows.
- ❖ **SDI – Safe Direction:** the SDI function prevents the motor shaft moving in an unintended direction. Any movement in the wrong direction is detected and the drive is shut down safely.

**FUNCTIONS TO SAFELY MONITOR POSITION:**

- ❖ **SLP – Safely Limited Position:** the SLP function prevents the motor exceeding defined position limit(s). Monitored



SCA - Safe Cam  
Sichere Nocken

functions that exceed the limit value are detected and the drive is shut down safely.

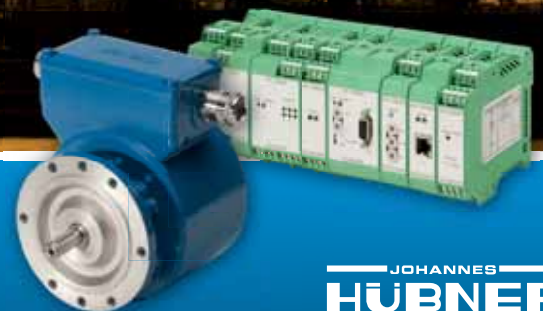
- ❖ **SCA – Safe Cam:** the SCA function supplies a reliable output signal to indicate if the position of the motor shaft is within a defined range. The output signal is reset if the limit value is exceeded; no other reaction follows.

**U-ONE-SAFETY: SAFETY – EASILY IMPLEMENTED**

System operators and machine builders are faced with the question of how to practically and economically implement these safety functions while maintaining the necessary Performance Level (PL) and Safety Integrity Level (SIL). Purely implementing these features by

Frank Tscherney, General Manager

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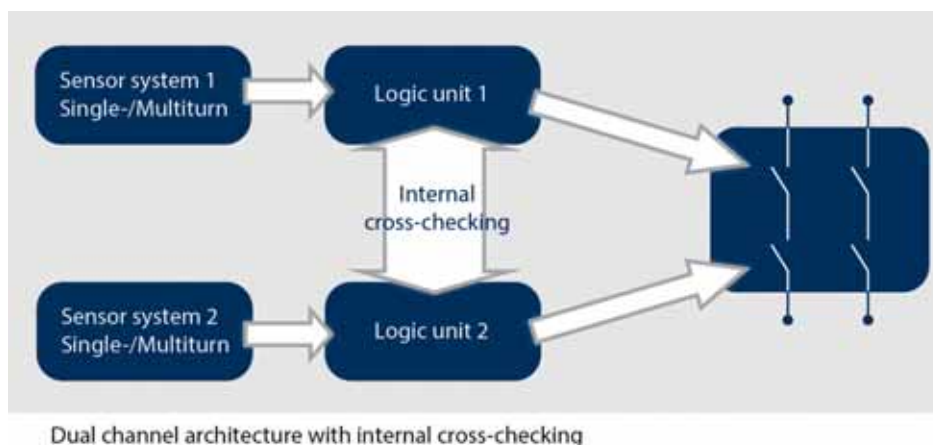
means of a safety PLC is often not desired, because that significantly increases the complexity of the system — and as a result the dependence on experts who are able to programme the controls accordingly, and who are often not on-site to intervene when needed. By contrast, the U-ONE-SAFETY makes it easy to implement movement and position dependent safety functions. Depending on requirements U-ONE-SAFETY monitors the safety functions SLS (Safely-Limited Speed), SSM (Safe Speed Monitor), SDI (Safe Direction), SLP (Safely-Limited Position) and SCA (Safe Cams) — and is configured according to customer specifications. Monitoring the speed and position of the deployed traversing and hoisting equipment are typical tasks in the bulk goods sector. When hoisting gear is lowered, SLP monitoring, for example, can ensure defined limit positions are reliably monitored. When configuring the U-ONE-SAFETY the traversing range is initially calibrated. Subsequently, it is possible to define several points within this range at which reliable safety monitoring is desired. For instance, when hoisting gear moves loads it is often permissible to travel at greater speeds at mid height than after a defined slow-down point is reached close to a final position switch, at which point travel speeds must be slower.

#### MORE THAN JUST A NORMAL ENCODER

In particular the safe position and error switches as well as the safe absolute encoder interfaces are new features in comparison with the previous version of the U-ONE-SAFETY. In addition, the system offers a reliable speed switch as well as optional current or incremental outputs. It is possible to simply and reliably programme the respective parameters utilizing the configuration software included in the scope of supply — without having to intervene in the higher-level controls. Thomas Brandenburger, head of the project management department, explains: “With integrated safety logic and safe switching outputs U-ONE-SAFETY is far more than just a normal encoder. The user is able to very easily implement speed and position dependent safety functions without needing a lot of programming know-how. And in the event a device needs to be replaced the stored parameters can easily be transferred to the new device — it can’t get more straightforward than that.”

#### CERTIFICATION FACILITATES SIMPLIFIED SAFETY REVIEW

With integrated dual channel architecture and internal cross-checking the U-ONE-SAFETY is ideally suited for applications up to safety category 3 and Performance Level (PL) d to DIN EN ISO 13849 as well as Safety Integrity Level (SIL) 2 to DIN EN 61508. The advantage of dual channel architecture: the safety



Dual channel architecture with internal cross-checking

function is always retained even when an error occurs. Two separate sensors generate a signal independent of one another. Two logic units cross-check if the values are identical. Finally, the signals are fed to a switching output (speed and position switches are possible), which also boasts dual channel architecture. “This integrated, system-wide dual channel architecture is the basis for the classification in safety category 3. That means it is possible to deploy the U-ONE-SAFETY in a much wider spectrum of applications”, says Brandenburger. Certification means it is possible to classify the device as a safety component during the safety review required by the standard, something that significantly reduces the burden of assessment on the part of the customer.

It is possible to combine the different functions, output signals and interfaces within the scope of a modular concept to create the right solution for the respective application. Two different versions of the system are available: the U-ONE-SAFETY-Compact that sees modules attached to the basic unit within a compact casing; then there is the U-ONE-SAFETY-LWL that features a basic unit in a robust casing, which is connected to the corresponding modules in the switchboard enclosure via fibre optic cabling.

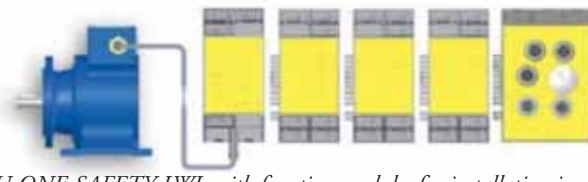
#### RUGGED AND RELIABLE: IDEAL FOR NEW INSTALLATIONS AND UPGRADE PROJECTS

“With U-ONE-SAFETY the customer receives all of the functions and interfaces he requires in a single compact device”, explains Brandenburger. U-ONE-SAFETY is suitable for both new installations and upgrade projects. This system means there is no longer any need for mechanical cam switches, mechanical cam controllers, intermediate or limit switches. Characteristics such as the rugged construction, the high degree of protection, even when the terminal box is open (thanks to the fully encapsulated base), and robust O-ring-seals in the terminal box cover ensure the U-ONE-SAFETY is the right solution for use in extreme environments — in particular in steel and rolling mills, in mining, in crane technology and in the bulk goods sector. Moreover, all of the devices offer high connection flexibility with safe cable entries — on both sides.

DCi



U-ONE-SAFETY-Compact with function modules in a robust casing.



U-ONE-SAFETY-LWL with function modules for installation in a switchboard enclosure.

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