



DRY CARGO

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FEATURES

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SEPTEMBER 2017 issue

featuring...



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Dry bulk trade backdrop remains solid

Doubts about whether the commodity import demand pace seen during the first half of this year can be sustained in the period ahead are prominent. Yet global seaborne dry bulk trade growth in 2017 as a whole probably will achieve a notable acceleration.

Recent indicators of economic activity, in many key countries affecting dry bulk trade movements, have reinforced perceptions of a broad pickup unfolding. The latest IMF assessment for China's economy envisages GDP growth in 2017 remaining at last year's 6.7%, instead of the previously expected slowing. Improving trends in the European Union and Japan have become more visible, while the USA also seems set to raise its expansion rate this year.

GRAIN

The grain trade outlook remains quite flat at present, with predicted import reductions in some countries only slightly exceeded by offsetting increases elsewhere.

Based on the latest International Grains Council estimates, world trade in wheat plus corn and other coarse grains could increase by just 2mt (million tonnes) or 0.5% in the current 2017/18 crop year, reaching 354mt.

Among grain importers, reductions are envisaged in China (due to high stocks) and India (reflecting a better harvest). By contrast, EU imports may rise amid tighter domestic supplies and rising consumption of corn. As shown in table 1, much larger changes are likely

among suppliers. Higher grain exports from South America (especially Brazil's corn) and rises in the Black Sea and Europe are expected to be accompanied by sharp downturns in the USA and Australia.

IRON ORE

Major importers of iron ore look set to either maintain, or in some countries increase, purchases during 2017, supported by flat or higher steel production. In China, Japan, South Korea, Taiwan and the EU, together comprising 95% of global seaborne iron ore imports, expanding raw materials consumption is a feature.

While China's iron ore imports expansion is most prominent, other buyers are seeing positive trends evolve. In particular, reviving European steel output is providing additional strength. Recently Eurofer, the European Steel Association, suggested that output in steel-using industries within the EU could grow by 3.5% this year, a notable improvement, and pressure from imported steel products is easing, further benefiting activity at domestic steel mills.

COAL

In the coal sector, changes already seen and those expected in the months ahead confirm expectations of a pickup in global seaborne coal trade in 2017 following two declining years. Continuation of this positive trend remains highly uncertain, however, given emphasis on switching towards

cleaner fuels and renewable energy sources.

Some forecasts point to a possible 3-4% increase in world coal trade this year, greatly aided by expansion in the steam coal segment, comprising almost four-fifths of the total. More growth in China's steam coal imports is widely foreseen but, conversely, India's annual volume may continue declining from the 145mt seen last year. Another supportive change could be no further weakening in Europe's import demand, after huge reductions in previous years.

MINOR BULKS

Many industries using minor dry bulk commodities could see increased volumes of imports during 2017, boosted by the more buoyant general economic background. Global industrial commodity movements including steel products, forest products, and bauxite/alumina could be favourably affected.

BULK CARRIER FLEET

Expansion of carrying capacity in the world fleet of bulk carriers now seems likely to accelerate somewhat in the current year. The calculations shown in table 2 suggest that fleet deadweight capacity may expand by around 3% during the twelve months to end 2017, reaching 816m dwt. While new ships deliveries from shipbuilders' yards are expected to fall sharply by 15%, to about 40m dwt, scrapping of old vessels has retreated, perhaps falling below 20m dwt, resulting in a large net addition.

TABLE 1: MAJOR GRAIN EXPORTING AREAS (MILLION TONNES)

	Wheat and coarse grains, crop years ending June					
	12/13	13/14	14/15	15/16	16/17	17/18*
North America	73.2	106.6	108.2	102.9	122.2	102.4
South America	63.4	41.0	49.1	67.7	51.8	73.5
Black Sea	45.9	66.4	70.9	82.2	88.7	91.2
EU	28.3	40.0	48.1	46.9	34.9	37.5
Australia	27.2	25.6	23.5	22.0	32.1	27.7

source: International Grains Council *forecast, 24 August 2017

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

	2012	2013	2014	2015	2016	2017*
Newbuilding deliveries	100.4	63.0	48.2	49.3	47.2	40.0
Scrapping	33.4	23.2	16.4	30.7	29.3	18.0
Losses	0.1	0.5	0.1	0.2	0.2	0.3
Other adjustments/conversions	-1.3	0.3	0.0	-0.4	-0.6	0.0
Net change in fleet	65.6	39.6	31.7	18.0	17.1	21.7
Fleet at end of year	687.4	727.0	758.7	776.7	793.8	815.5
% growth from previous year		5.8	4.4	2.4	2.2	2.7

source: Clarksons Research (historical data) & BSA 2017 forecast *forecast

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Dry bulk imports growth continues in China

Trade and freight market optimists looking for a further boost from China's dry bulk imports this year have not been disappointed. Global seaborne dry bulk trade, and shipping activity, has benefited greatly from additional commodity volumes purchased by Chinese buyers, especially iron ore, coal and soyabean.

During the first seven months of 2017, a sturdy pace unfolded. However, in recent weeks, there were a few signs of a possible and not entirely unexpected slackening over the year's remaining months. Prospects depend partly on assumptions about government policy measures affecting the economy and trade in particular, not all of which are easy to predict.

Support has been derived from the economy's brisk performance. Economic activity in China, based on the GDP measure, now appears likely to maintain last year's 6.7% rate in 2017 as a whole, instead of slowing as widely expected earlier. However, various restraining measures have been introduced and, after the second quarter's 6.9% increase, subsequent quarterly periods may show a slackening pattern.

In the world's biggest single commodity trade, China's iron ore imports, remarkable strength has continued. The January–July 2017 total reached 626mt (million tonnes), a 44mt or 7.5% increase compared with last year's same period. Nevertheless, there are doubts about whether the annual



Soyabean harvesting.

growth rate will be as high.

Steel production growth was a positive influence. Robust Chinese domestic demand was instrumental in raising crude steel production by 5% to 492mt in the first seven months of this year. Rising iron ore stocks at discharge ports also contributed greatly to the strength of ore imports.

Indications point to easing steel demand from construction and manufacturing over the months ahead, restraining steel output. Ore stocks at ports, which have exceeded 140mt, could be reduced. These changes may adversely affect purchases of iron ore from foreign suppliers.

Coal imports into China also have been performing strongly. In the January–July period this year, an extra 23mt was

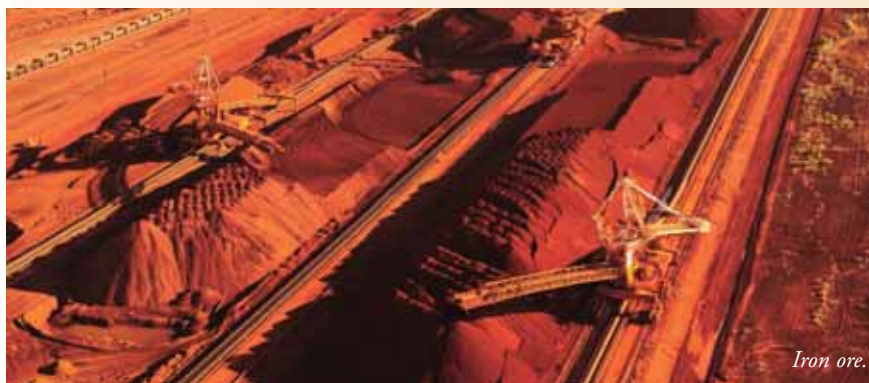
received. The addition raised the total volume (including low quality lignite) to 153mt, up by 18%, although relatively low levels in last year's early months exaggerates the comparison.

Several signs suggest that coal import demand in the remainder of 2017 may not be quite so buoyant. Domestic coal production, which dominates the market, is reviving with growth of 5% to 1.7 billion tonnes in the first half. Further government controls on imports are being implemented, but great uncertainty surrounds the impact of these new regulations.

Another seaborne cargo trade closely watched is soyabean, the third largest dry bulk commodity volume imported into China. This year's first seven months saw Chinese oilseed crushing mills receiving 55mt of soyabean, reflecting rapid 19% growth.

Despite rising soyabean output at domestic farms, vigorously expanding soyameal and soyaoil consumption boosts foreign beans purchases, which supply most of the market. Even if second half 2017 imports moderate, an upwards trend in annual volumes looks set to persist.

Richard Scott



Iron ore.

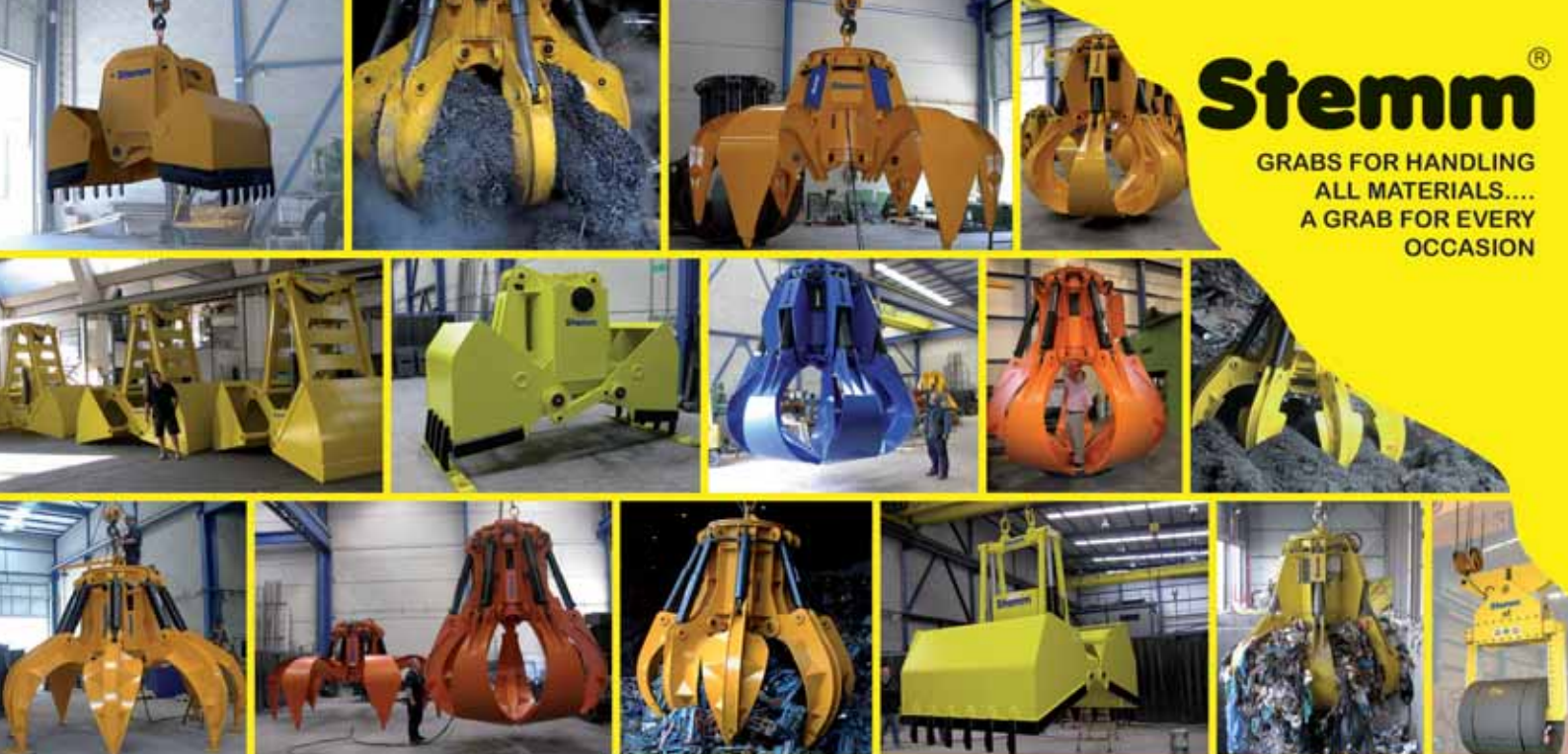
CHINA'S IMPORTS OF MAIN DRY BULK IMPORTS (MILLION TONNES)

	2012	2013	2014	2015	2016	% change**
Coal*	288.9	327.2	291.6	204.2	255.7	+25.2
Iron ore	745.5	820.3	933.1	953.4	1024.7	+7.5
Soyabean	58.4	63.4	71.4	81.7	83.2	+1.8
Grain	11.6	12.3	16.9	29.3	18.4	-37.2
Bauxite/alumina	45.1	75.4	41.8	60.8	55.1	-9.3
Nickel ore	65.0	71.2	47.7	35.2	31.9	-10.3

source: China Customs, USDA, BSA *coal includes lignite ** 2016 compared with previous year

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Feed grains harvest lower in 2017



Maria Cappuccio

FEED GRAINS HARVEST LOWER IN 2017

The International Monetary Fund (IMF) forecast a positive outlook for the global economy with recent data pointing to the broadest upswing in a decade, with improvements in emerging and developing Asian economies including China, and in major developed economies like Japan and Europe, with global growth projected at 3.6% for 2018.

Prospects for global wheat, coarse grain and oilseed crops improved too, despite smaller plantings in some countries and

weather set-backs anticipated to lower overall output to 2.6bn/t in 2017, below last year's exceptional record. Global grain consumption is expected to outpace production reducing global stocks and although grain stocks remain adequate, they are expected to fall for the first time in five years. The preliminary forecast for oilseeds indicates output to surpass last season's record.

LOW PRICES REDUCE PLANTINGS

Lower wheat crops are anticipated in the

US, Canada, Australia and the EU, partially offset by Russia's exceptional harvest and larger crops in Ukraine, Kazakhstan, Argentina and India, with global wheat output forecast at 743mt (metric tonnes) in 2017/18. Smaller crops for corn, barley and sorghum reduce coarse grain output to 1,314mt, below last year, mainly due to reduced output expected in the US, China, Brazil, South Africa, Australia and EU. For oilseeds, with a larger planted area, the global oilseed crop is forecast by USDA to rise to 577mt, a fall in soybean output to

MAJOR FEEDSTUFFS — PRODUCTION, USE, FEED & STOCKS 2016–2017/18 (MT)

	Prod 16/17	Prod 17/18	Use 16/17	Use 17/18	Feed 16/17	Feed 17/18	Trade 16/17	Trade 17/18	Stocks 16/17	Stocks 17/18
Wheat	754	743	739	737	147	141	182	182	259	265
Coarse grains	1,364	1,314	1,350	1,349	800	814	183	186	263	228
Total grains	2,118	2,057	2,089	2,086	947	955	365	368	522	493
Oilseeds	572	577	468*	488*	312**	326**	169	174	108	109

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

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

347mt, offset by gains in other major oilseeds, including sunflower seed, palm kernel rapeseed and cottonseed.

RIISING FEED DEMAND IN 2017

Global supply of grains and oilseeds more than adequate to meet projected demand of 2,086mt, 3mt below last year. Feed grain demand forecast by USDA to increase by 8mt to 955mt, while feed wheat is expected to decline due to competition with other ingredients and increased use of coarse grains, mainly corn. Oilseed crushing is expected to increase by 20mt to 488mt driven by strong demand for oil meals for animal feed expected to rise by 14mt to 326mt.

Global grain stocks are expected to fall by 29mt to 493mt by the end of 2017/18. This includes China's 210mt stock-pile of wheat and coarse grains, representing nearly 43% of the global total.

EXCEPTIONAL RUSSIAN WHEAT HARVEST

Good weather led to a significant upward revision to the global wheat crop in August, mainly due to a further 3mt upgrade to 80mt for the Russian wheat crop, with improvements also for Kazakhstan 14mt and Ukraine 26.5mt.

SIGNIFICANT FALL IN NORTH AMERICAN OUTPUT

US wheat, output forecast to fall by 25% to 47mt, due to a lower planted area with drought affecting yields for spring and durum wheat across the US Northern Plains. Drought has also reduced yields in Canada, with wheat production forecast at 27mt. Strategie Grains recently downgraded the EU crop by 4mt to 146mt, wet weather delayed the harvest and affected quality and protein contents in Germany, Poland, UK and in other EU countries, likely to increase supplies of feed wheat.

AUSTRALIA, ARGENTINA WHEAT LOWER

Argentine wheat production is expected to be lower in 2017/18 partly due to a smaller wheat area of 5.2–5.4m/ha. The National Australia Bank (NAB) cut its forecast for

GLOBAL WHEAT PRODUCTION 2013–2017/18 (MT)

	2013/14	2014/15	2015/16	2016/17	2017/18
EU	145	157	161	146	150
Other Europe	4	4	4	5	4
CIS Baltic's	104	113	118	130	134
N & C America	99	88	88	98	77
S America	20	24	21	28	26
N East Asia	42	35	43	40	41
F East Asia	249	258	251	251	262
Africa	27	24	26	21	25
Oceanic	26	24	25	36	24
Total	715	728	737	755	743

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

the Australian wheat crop by 600,000/t to an eight-year low of 22.7mt (USDA 23.5mt) citing below average rains, which affected the country in May–June, with June being the second driest month on record, despite decent rain falls in August, across Western Australia, South Australia, Victoria and southern New South Wales, dryness remaining a threat.

FEED WHEAT DISPLACED BY CORN

Despite ample supplies of feed wheat especially in the EU, wheat for feed use is forecast to fall by 6mt to 141mt, due to competition from corn and other feed products, with the biggest decline expected in China, other Asian countries, North America and the EU, while wheat used for food, starch and ethanol is forecast rise by 4mt.

RUSSIAN WHEAT DOMINATES EXPORTS

Global wheat trade is forecast at 182mt, similar to last year. Black Sea exporters are expected to take the lion's share of the global market forecast at 55mt (Russia 31.5mt, Ukraine 16mt and Kazakhstan 7.5mt). French wheat quality, despite the rains, is better than anticipated, although wheat quality issues, especially in Germany, may affect EU exports of 29.5mt. US wheat exports are expected to fall to 26mt. Tight domestic supplies of US high-protein wheat

to prompt a rise in imports to over 4mt, mainly sourced from Canada, while EU wheat imports to rise to 6.5mt. Larger imports are also forecast for Bangladesh, Iraq and Turkey.

LARGE SUPPLIES PRESSURE FEED VALUES

The outlook for wheat remains bearish due to large Black Sea crops especially in Russia, muted demand, with global stocks expected to grow to 265mt by the close of 2017/18. Egypt, confirmed that Russian suppliers made the lowest offer in a tender for wheat with 12.5% protein for August delivery \$192/t FOB (free on board) (11 August 2017). CBOT Wheat Contract Dec closed down at \$4.37/bu (\$158.94/t — 21 Aug) with feed wheat qualities setting new lows — UK feed wheat £137.50/t (\$176.50/t — 22 Aug).

LOWER COARSE GRAIN HARVEST IN 2017/18

Global coarse grain output is tentatively forecast at 1,314mt, with the major crops corn 1,034mt, barley 140mt and sorghum 60mt, all below last year, but still the second largest crop on record, with smaller crops especially in the US, Brazil, China, South Africa, Australia and EU.

GLOBAL COARSE GRAIN STOCKS FALL

Overall, global use of coarse grains is projected lower at 1349mt in 2017/18 and masks a rise in feed use, up by 14mt to 814mt, offset by a fall of 15mt to 535mt for food and industrial use. The increase in feed use is mainly for corn, as smaller supplies expected to reduce barley feed use down by 7mt and sorghum by 1mt. Feed use over the last three years has risen by over 60mt in response to livestock demand, with coarse grain consumption to outstrip production this year. Trade is boosted 3mt to 186mt, with global stocks, expected to fall from 263mt to 228mt mainly in China and the US, with key

WORLD WHEAT SUPPLY & DEMAND 2013–2017/18 (MT)

	2013/14	2014/15	2015/16	2016/17	2017/18
Production	715	728	737	755	743
Consumption	698	705	712	739	737
Trade	162	162	172	182	182
Stocks	195	218	243	259	265
of which China	65	76	97	111	128
Key exporters *	54	60	65	75	68

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

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

exporter stocks at 78mt by the end of 2017/18.

LOWER CORN OUTPUT IN 2017/18

Following last year's exceptional crop, global corn production is forecast to fall by 37mt to 1,034mt in 2017/18, mainly due to lower US corn plantings and yields. USDA pegs the US corn crop at 360mt based on yields of 169/bu/acre. Smaller crops are also expected in a number of countries including China revised down from 215mt

WORLD COARSE GRAIN SUPPLY & DEMAND 2013–2017/18 (MT)

	2013/14	2014/15	2015/16	2016/17	2017/18
Production	1,284	1,312	1,260	1,364	1,314
Consumption	1,238	1,276	1,256	1,350	1,349
Trade	165	174	185	183	186
Stocks	210	246	249	263	228
of which China:	83	102	112	103	82
Key Exporters*	54	62	60	82	78

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



Rapeseed.

to 211mt, the EU 60mt, South Africa 13mt with better crops in Russia 16.5mt and the Ukraine 28.5mt.

ARGENTINE CORN AREA TO EXPAND

With planting under way on a record 5.4m/ha (13.3m/acres) Buenos Aires Grain Exchange forecast the corn crop at 46mt, with huge global soybean supplies and

falling prices, growers expect corn to be more profitable this season despite the crop's higher production costs.

LARGE SUPPLIES TEST STORAGE IN BRAZIL

Brazil's corn crop forecast at 95mt in 2017/18 is expected to be lower than last year. Farmer reluctance to sell soybeans in a falling market highlighted, amongst other

things, lack of adequate storage. With newly harvested corn stored in temporary bags or piling up outdoors, increased the tempo and pace of corn exports in recent months, despite less favourable exchange rates, higher freight and lower prices — Conab estimates exports of 28mt and higher stocks of 21.6mt by close of 2016/17. Brazil opened its first large-scale corn ethanol plant in August. The \$115m FS Bioenergia facility located in Mato Grosso, is expected to process 22m/bu (558,000/t) of corn to produce ethanol and feed products for the livestock industry.

CORN FEED USE TO RISE BY 21MT

Based on USDA's current projections, for the first time in five years, global corn production at 1,034mt will be 27mt short of projected demand at 1,061mt. Food, starch and ethanol use expected to fall

WORLD CORN SUPPLY & DEMAND 2013–2017/18 (MT)

	2013/14	2014/15	2015/16	2016/17	2017/18
Production	995	1,020	970	1,071	1,034
Consumption	954	984	965	1,055	1,061
Trade	131	128	145	145	152
Stocks	174	209	214	229	201
of which China:	81	101	111	101	81
Key Exporters*	48	56	53	75	72

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

Argentina to export 180mt of grain by 2025

Argentina's Secretary of State for Agriculture, Animal Husbandry and Fishing, Ricardo Negra, estimates that the country will produce 180mt (million tonnes) of grain by 2025. This suggests a 30% increase in animal protein of 30%, totalling some 6.8mt.

The previous year's harvest had amounted to 117mt, while this year's is projected to reach 130mt and changes to technology will boost this to 180mt by 2025, said the Minister. These figures suggest a 55% increase in gross production.

Argentina's farmers have been particularly quick to adopt new technology to boost yields, with a report showing that, on average, the country's farmers tend to be 15 years younger than their US equivalents and that 20% of these are university educated.

Negri also announced investment of \$16 millions in the road network and \$15 million in rail infrastructure. However, he said this did not necessarily mean that logistics costs would fall, since this depended on other factors, most notably technological innovation.

"Logistics and high transactional costs are what most affect our competitiveness," said Negri.

Barry Cross

by 15mt to 410mt—a recent report by Rabobank highlighted the global trend for healthier food and snacks long-term likely to reduce sugar and the use of corn syrups in processed foods. By contrast feed use, is forecast to grow by 21mt to 651mt, with the increase expected to occur in China, EU, South America, US and in some other countries including South Korea, where demand for corn in compound feeds for swine and poultry rations is expected to rise by 400,000/t to 8mt. Iran's increased feed use is due to poultry industry expansion supported by growing corn imports up to 1mt, with larger corn use in Mexico to support rising poultry, pork and beef output.

GLOBAL DEMAND FOR MEAT REFLECTED IN VIBRANT TRADE

The UN's Food and Agriculture Organization (FAO) forecasts growth in meat production for almost all countries to rise by 1.9%, but offset by a fall in China's output of poultry and pig meat (hit by outbreaks of Highly Pathogenic Avian Influenza (HPAI) and ongoing restructure), to below 0.3%, with world meat output at 322mt. The largest growth in production is forecast for beef, with smaller increases for sheep meat and poultry. Outbreaks of HPAI combined with reduced producer returns in several countries, expected to dampen growth, with a small decline in pig meat mainly in China. While global markets for pig and poultry meat remained well supplied, meat prices could have declined further if not underpinned by strong consumer demand. FAO expect trade to grow by 2.5%, fuelled by strong demand, especially in China, met by increased shipments from the US and Brazil.




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SMALL INCREASE IN CORN USE FOR ETHANOL

Following persistent lobbying by the US Renewable Fuel Association (RFA), the Renewable Fuel Standard (RFS) was re-established at the 15bn/gallons level for conventional renewable fuels like corn ethanol. The USDA projects corn use for ethanol in 2017/18 at 140mt, to produce over 15bn/gallons of ethanol and 42mt of livestock feed (37mt Distillers Dried Grains and Solubles [DDGS] 5mt corn gluten-feed/meal). Falling corn prices pushed US ethanol margins to their highest levels with lower corn prices and higher DDGs values, since the beginning of the year, ethanol output has averaged near or above 1/m barrels per day.

BRAZIL SLAPS TAX ON US ETHANOL

US ethanol exports reached an all-time high of 1.15bn/gallons (September–June 2017), including significant exports to Brazil, with notable increases for India, Canada and other countries. Last month, the Brazilian government introduced a 20% tax on US ethanol imports. The tax will apply beyond the first 600/litres, and, in place for two years, will likely close a lucrative US market-last year Brazil imported around 24% of the total US ethanol exports. Competition for ethanol

MAJOR OILSEED SUPPLY & DEMAND 2012–2016/17 (MT)

	2013/14	2014/15	2015/16	2016/17	2017/18
Production	504	537	521	572	577
of which (Soybeans)	282	320	313	352	347
Crush	420	440	446	468	488
Consumption*	279	295	304	317	331
Trade Meals*	84	86	87	89	91
Trade Seeds	134	147	153	169	174
Stocks	78	93	90	108	109
of which (soybeans)	44	56	55	72	74
key exporters**					

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

**Argentina, Brazil, US

markets to grow as China ramps-up ethanol output and exports, at the same time reducing the corn stock-pile. China's ethanol exports Jan–Jul 25,660,875 gallons (97,137m³).

LARGER IMPORTS SUPPORT FEED DEMAND

Global corn trade expected to rise by 4mt to 152mt, with exports from the US 47mt lower than last year, and improved export prospects for Brazil 35mt, Argentina 28mt and Ukraine 22mt, to meet rising demand in a number of countries including, Mexico, Colombia, South Korea, Iran, and also to

shore-up smaller corn crops in China and the EU. In the EU imports are forecast at 16mt, better yields in France offset by drought and heat strained crops in Hungary and Italy. Drought and a 4mt cut in corn output in China fuelled a rise in domestic prices, with 910,000/t of corn imported in July. Imports for this year are forecast at 3mt, and may be revised up.

LARGE SUPPLIES, PRESSURE EXPORT VALUES

Reports that Brazilian farmers' stored corn in the open and on the ground, confirmed the exceptional corn crop outweighed



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storage capacity, and further pressured US and Brazilian export prices. Taiwan's feed industry procurement association MFIG purchased 130,000/t of corn (Aug 23), likely to be sourced from Brazil, in an international tender. The corn was purchased in two 65,000/t consignments, the first tranche bought at a premium of \$114.60 c&f over the Chicago December 2017 corn contract; the second at a premium of \$105.68 c&f over the Chicago March 2018 corn contract

BANK SEES RISE IN CORN PRICE

Commerzbank revised its forecast for the corn price to \$3.80/bu for the Oct-Dec period, citing a drop in global corn output, a supply deficit, reduction in global stocks, lower export availability in the EU and rising imports, to support a corn price above the \$3.57½/bu that the December contract traded at the CBOT on 23 August 2017.

RECORD OILSEED OUTPUT IN 2017/18

Good prospects for almost all major oilseeds are expected to lift production to a new record in 2017/18. USDA forecasts a large US crop and lower soybean crops in South America, where lack of finance and ongoing political upheaval in Brazil, may result in reduced plantings. CBOT Nov '17 contract closed at \$938.0/bu (23 Aug '17).

SMALLER SOYA OFFSET BY OTHER MAJOR OILSEEDS

Oilseed production is forecast by USDA to rise to a record of 577mt in 2017/18.

Lower soybean output at 347mt, due to smaller crops anticipated for Brazil 107mt and Argentina 57mt, with prospects for a larger US crop of 119mt (although some market analysts see lower US soy yields) and firm gains for other oilseeds, including palm kernel 18mt, expected to ease the former tightness in global palm oil supplies, the Malaysian Palm Oil Board upgraded its forecast to 20mt, with better crops expected for rapeseed 73mt, cottonseed 43mt, sunflower seed 47mt, while copra 6mt and groundnut at 43mt similar to last year.

THIN RAPESEED SUPPLIES

A large rapeseed crop is projected for the EU forecast at 22mt, although stocks expected to remain tight. Dry conditions that persisted in Canada may reduce canola estimated from below 18mt to over 20mt. As the rapeseed season develops, any further production shortfalls in the major producing and exporting countries would further tighten the global rapeseed market, with potential price premiums for rape over other oilseeds. Canola Futures-Winnipeg closed at Can\$504.50/t (21 Aug '17) for November delivery, with a significant premium U\$57/t over the Chicago soybean contract.

TRADE BOOSTED BY RISE IN CHINA'S SOYBEAN IMPORTS

Global trade in oilseeds is forecast to rise by 5mt to 174mt, led by larger imports to China. With Brazil expected to export

15mt meal/64mt beans, US 11mt meal/62mt beans and Argentina 32mt meal/9mt beans. Ample oilseed stocks are forecast at 109mt slightly above last year, including lower stocks of rapeseed 4.8mt and sunflower seed 2.3mt.

RISE IN GLOBAL OILSEED CRUSHINGS

Global oilseed crush is expected to rise by 20mt to 488mt, mainly led by soy bean meal, with oil meal consumption up by 14mt to 331mt, supported by increased feed demand for oil meals and oils/fats for the food/Industry. The US Commerce Department's recent decision to impose duties of 40–68% on biodiesel imports from Argentina and Indonesia, expected to halt imports, lent support to US soybean values, with the gap to be filled by domestic soy oil supplies.

MEAT AND AQUACULTURE DRIVE RISING FEED DEMAND

Perversely, while China's meat production is expected to contract in 2017 as they continue to up-scale facilities from backyard to more commercial operations, the uptake of oil meals by the country's pig and poultry sectors and a growing aquaculture industry is expected to expand. Compound feed contributes to increased demand for soybean products in China as a majority of commercial farms use soybean meal in mixed feed rations. Elsewhere in Asia, oil meal consumption is expected to rise with higher consumption also envisaged in Brazil and Argentina, modest increase in EU and US.

DCi

SEA\LNG calls for compliance and enforcement as 2020 sulphur cap looms

28-STRONG COALITION ADVOCATES GREATER MOMENTUM FROM SHIPPING INDUSTRY TO DELIVER VITAL AIR QUALITY IMPROVEMENTS

In August, SEA\LNG, the multi-sector industry coalition working to facilitate and accelerate the widespread adoption of liquefied natural gas (LNG) as a marine fuel, urged the industry as a whole to redouble its commitment to compliance with, and enforcement of, IMO Marpol VI Regulations.

SEA\LNG recognizes that the Port State Authorities have a clear obligation under the governing Treaties to ensure even-handed and consistent enforcement of the IMO regulations. While enforcement has always been a difficult issue, now is the time for all IMO members to understand the importance of this regulation and ensure that it is implemented and enforced as envisioned.

The coalition acknowledged that today's shipowners are operating in a challenging economic environment amid stringent and increasing environmental regulations. With a complex investment decision matrix of risks when considering how to comply with the global sulphur cap of 0.5% from 2020, shipowners must make decisions that remain viable into the future and make choices between a limited number of options; LNG, scrubbers, or low sulphur fuels.

SEA\LNG chairman Peter Keller commented: "Shipping has made significant progress in reducing its environmental impact from harmful emissions, but more needs to be done. All parties, especially the Port State Authorities must play their part. Effective and consistent enforcement, across all jurisdictions of the IMO emissions regulations, will be essential to ensure more environmentally friendly shipping and a level playing field for all shipping companies. Flag states and port authorities have a clear and key responsibility in ensuring compliance. If we do not collectively commit to compliance and enforcement, then we will continue to miss a tangible and viable opportunity to eradicate harmful emissions such as Sulphur Oxide (SO_x), Nitrogen Oxide (NO_x), and Particulate Matter (PM). This seems unacceptable given the opportunity we have readily at hand."

SEA\LNG added that in addressing the primary concerns of cost and compliance, LNG as a marine fuel provides a means of negating current and potential future local emissions challenges, and is a step in the right direction towards reducing green-

NO_x emissions are harmful to the environment.



house gas (GHG) emissions from maritime transport.

Keller explained: "LNG far exceeds alternative options in terms of emissions reductions. It emits zero sulphur oxides (SO_x) and virtually zero particulate matter (PM). Compared to existing heavy marine fuel oils, LNG emits 90% less nitrogen oxides (NO_x) and through the use of best current practices and appropriate technologies to minimize methane leakage, offers the potential for up to a 25% reduction in GHGs. Advancements in dual-fuel technology and propulsion, enhanced control systems, and future use of gas turbine technologies present further opportunity for increased GHG reductions."

The energy transition is moving in a clear direction. The vast majority of the world's top ten bunkering ports offer LNG bunkering or have firm plans to do so by 2020. As this LNG bunker market continues to develop, there is already a drive to meet demand for LNG as marine fuel at these and other critical locations. By the end of 2017, six LNG bunker vessels will be in operation — expanded from one at the start of the year. These vessels are key to scaling-up demand for LNG as a marine fuel and delivering fuel in a way that is 'normal' for shipowners. Added to which, new bunkering hubs are developing which will leverage existing bulk LNG infrastructure.

Keller concluded: "LNG will be one of a

portfolio of solutions going forward to help lower emissions, creating a more sustainable future for shipping. We recognize that there are barriers and limitations, but we are confident that by working together, we can overcome these hurdles as the industry has always done in the past. We do, however, require a greater sense of urgency and commitment."

SEA\LNG's membership, which spans the LNG value chain, stands at 28 organizations and continues to grow, highlighting the industry's growing recognition of LNG as a cost effective, safe, and more environmentally friendly long-term fuelling solution.

The coalition is committed to uniting knowledge and expertise from across the value chain. It firmly believes that collaboration, demonstration, and communication on key areas such as safety, regulation, emissions and the economic case are essential to providing the confidence and demand required for an effective and efficient global LNG value chain by 2020.

ABOUT SEA\LNG

SEA\LNG brings together key players from across the supply chain, including shipping companies, classification societies, ports, major LNG suppliers, downstream companies, infrastructure providers and OEMs (original equipment manufacturers) to address market barriers and transform the use of LNG as a marine fuel.

SEA\LNG is a not-for-profit collaborative industry foundation serving the needs of its member organizations. SEA\LNG's members include: ABS, Bureau Veritas, Carnival Corporation & plc, Clean Marine Energy, DNV GL, Eagle LNG Partners, ENGIE, Gas Natural Fenosa, GE, GTT, JAX LNG, Keppel Gas Technology, Lloyd's Register, Marubeni Corporation, Mitsubishi Corporation, Mitsui & Co., Ltd., Novatek Gas & Power, NYK Line, Petronet LNG, Port of Rotterdam, Qatargas, Shell, Sumitomo Corporation, Total, TOTE Inc., Toyota Tsusho, Yokohama-Kawasaki International Port Corporation (YKIP), and Wärtsilä.

SEA\LNG is guided by a board, which is led by Chairman Peter Keller. Each member organization commits mutually agreed human resources, data analysis and knowledge sharing in support of SEA\LNG initiatives and activities and financially contributes via a membership fee. The SEA\LNG coalition was established in August of 2016.

DELIVERING A HIGHER STANDARD



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Damen delivers dredgers to Bangladesh

Following the delivery of various dredgers to Bangladesh, and the successful Damen Dredging Seminar in July in Dhaka, where Her Excellency Mrs Leoni Cuelenaere, the Dutch Ambassador to Bangladesh was the honourable Chief guest, Damen has again delivered multiple dredgers from available stock.

Regional Sales Director Rabien Bahadoer said, "Damen has again confirmed its long-term commitment to

Bangladesh by delivering quality dredgers with a proven design from ready stock. This will swiftly help our customers to start their dredging job in supporting the riverine country." Bahadoer added, "Our dedicated Service Team has overseen a very fast handover. This August delivery comes very soon after our well-received Dredging Seminar in July. The dredgers include various optional items, such as production meters, spud carriage systems and spare parts. A unique

achievement, and we expect that there is more to come."

DAMEN SHIPYARDS GROUP

Damen Shipyards Group operates 33 shipbuilding and repair yards, employing 9,000 people worldwide. Damen has delivered more than 6,000 vessels in more than 100 countries and delivers some 180 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.



Thordon and IMarEST call for full acceptance of water-lubricated propulsion systems

Shipping industry leaders who attended London International Shipping Week (LISW), which took place from 11–15 September, heard the case for water lubricated propeller shafts during an evening technical lecture organized by the Institute of Marine Engineering, Science & Technology (IMarEST).

On 13 September at the IMarEST's London HQ, Thordon Bearings' regional manager George Morrison, a chartered marine engineer with 23-years' experience, presented a paper calling for full acceptance of water-lubricated propulsion across the global shipping industry.

Outlining how water-lubricated propeller shafts have been used since the earliest days of shaft-driven propellers, Morrison's paper *Water Lubricated Propulsion — A Case for Full Acceptance* explored the pros and cons of current shaft lubricating methods. It proposed the most environmentally sustainable, cost-effective solutions available and also highlighted myriad onboard applications for grease-free bearings, such as deck winches, lifeboat

davits and cargo cranes.

"The introduction of new pollution regulations has led to a return to seawater-lubricated propeller shaft bearing systems, especially for those vessels trading in US or Polar waters, where the discharge of oil from any oil-to-sea interface in quantities that may be harmful to the environment is restricted," says Morrison.

"The IMarEST Technical Lecture during LISW provides an excellent opportunity to explain how new technology for polymer bearings, shafting materials and system packages not only increase bearing wear life and reduce ship maintenance costs, but can also keep our oceans clean."

According to Morrison, when seawater-lubricated propeller shaft lines are used rather than oil-lubricated shafts or pods, operating costs are reduced substantially over the life of the vessel as there is no AFT seal, no lubricating oil, no storage of oil, no sampling of oil and no disposal of oil. Additionally, there are no costly seal repairs that can cost as much as US\$300,000 per aft shaft seal.

David Loosley, Chief Executive, IMarEST, says: "The IMarEST's overarching vision is one of a world where marine resources and activities are sustained, managed and developed for the benefit of humanity. The Institute is always in full support of those seeking to find the most environmentally sound solutions for activities that may impact the marine environment and water lubricated propulsion is one such solution that calls for consideration."

ABOUT THORDON BEARINGS

A global leader in seawater-lubricated propeller shaft bearing systems, with over 35 years' experience in this technology, Thordon Bearings is renowned for supplying high performance, oil and grease-free bearing systems to the global marine, clean energy, pump and offshore markets. Thordon Bearings is the only manufacturer of propeller shaft bearings to guarantee its award-winning COMPAC system for a 15-year wear-life. Thordon systems and bearings are available worldwide through over 85 agents and distributors.

Flogas and ABP join forces to bunker ships with LNG in UK first

Flogas Britain has partnered with Associated British Ports (ABP) to bunker a ship with liquefied natural gas (LNG) for the first time ever in the UK.

The pioneering project, which mirrors similar successful schemes in other European countries, saw a 110-metre carrier named *Ireland* — operated by Norwegian shipping firm KGJ Cement AS — refuelled with LNG at the Port of Immingham on Wednesday 16 August.

The joint venture between Flogas (a major UK LNG provider) and UK port operator ABP marks a significant and unprecedented step forward for maritime bunkering in the UK. It means ships from across the globe will now have direct access to LNG — a fuel that is becoming increasingly popular in shipping, due to its ability to help vessels comply with current and future climate legislation.

Lee Gannon, managing director at Flogas, explains: “At Flogas, we pride ourselves on leading the way when it comes to developing the LNG industry in the UK, and exploring new opportunities for end users to benefit from this highly versatile fuel. There is great potential for LNG in the maritime industry as a more environmentally-friendly alternative to traditional oil-based bunker fuels, but until now this potential has remained untapped here in the UK.”

Although only a limited number of ships currently bunker with LNG, demand is expected to grow rapidly as environmental regulations increasingly prohibit the use of polluting heavy fuel oils. Both Flogas and ABP see potential to replace thousands of tonnes of heavy fuel oil each year with cleaner, cost-effective LNG.

Gannon continues: “We’re very pleased to have partnered with the country’s leading port operator, ABP, to turn vision into reality; our specialist expertise and theirs have come together perfectly to make this the success we knew it could be. We’re looking forward to working

with ABP and other prospective partners on future projects — especially as the popularity of LNG continues to gather pace in the maritime industry, in line with an increasing focus on reducing environmental impact.”

Mark Frith, port manager for ABP Immingham and Grimsby, adds: “We are proud to be a key part of this flagship operation, which has really put the UK on the map as the latest European hub for more climate-friendly bunkering. Demand is already beginning to shift away from oil across the international fleet, and we very much see natural gas taking its place as the marine fuel of choice. We look forward to welcoming increasing numbers of ships to Immingham as a result of our new and unique offering in partnership with Flogas.”

The new tanker-to-ship service provides the flexibility needed to service current demand, but as the LNG marine market grows, Flogas will invest in storage and bunkering facilities at ABP ports when required.

LNG AS ALTERNATIVE FUEL

LNG is produced by liquefying natural gas to significantly reduce its volume, so that it can be more efficiently transported.

Off mains, high energy users across all sectors, which would otherwise use oil (or electricity) to drive large manufacturing or industrial processes, would benefit by switching from oil to LNG — which is also ideal for large logistics operations, such as road haulage and shipping.

The UN International Maritime Organization has placed a cap on sulphur content in marine fuel oil from 2020, reducing limits from 3.5% to 0.5%. According to the *Financial Times* newspaper, “ship owners will have to switch to more expensive higher quality marine fuel, invest in emissions-cleaning systems, or switch to alternative fuels such as liquefied natural gas”.

ABOUT FLOGAS BRITAIN LTD

Flogas has more than 30 years’ experience in providing tailored energy solutions to both commercial and domestic customers across the UK. From liquefied petroleum gas (LPG), to liquefied natural gas (LNG) and mains gas — the company delivers high-performance, reliable, cost-effective energy solutions to suit customers’ exact needs — making it a leading ‘expert in energy.’

ABOUT ASSOCIATED BRITISH PORTS

UK port operator ABP has 21 ports and other transport related businesses creating a unique national network capable of handling a vast array of cargo. ABP contributes £5.6 billion to the UK economy every year and supports 84,000 jobs. The four ports on the Humber- Grimsby, Immingham, Hull and Goole- handle more than 58mt (million tonnes) of cargo between them each year worth approximately £75 billion. Grimsby and Immingham form the UK’s busiest trading gateway and move around 50mt of cargo

Mark Frith, port manager of Immingham & Grimsby ABP and James Goodson, National Account Manager at Flogas Britain Ltd.



MacGregor wins hatch cover and crane contracts for five Chinese bulk carriers

MacGregor, part of Cargotec, has received an order from Yangzijiang shipyard in China to equip five 62,000dwt open hatch bulk carriers (OHBC) with hatch covers and cranes. Equipment deliveries will start in 2018 and continue until 2019. The order was booked into Cargotec's third quarter 2017 order intake.

"We want to help our customers succeed," says Leif Byström, Senior Vice President, Cargo Handling, MacGregor. "Our commitment to this success is

MacGregor's long track record in engineering safe and efficient solutions for cargo handling and stowage."

The order comprises the design of key hatch cover components and the delivery of twenty cranes; four per vessel. Each crane will be fitted with an active rotation control (ARC) system, which stabilizes and automatically rotates a load in the air.

"This enables faster load handling, reduces cargo damage and delivers considerable energy savings," adds

Byström.

MacGregor shapes the offshore and marine industries by offering world-leading engineering solutions and services with a strong portfolio of MacGregor, Hatlapa, Porsgrunn, Pusnes and Triplex brands. Shipbuilders, owners and operators are able to optimize the lifetime profitability, safety, reliability and environmental sustainability of their operations by working in close cooperation with MacGregor.

BIMCO advice on life boat safety

BIMCO LAUNCHES NEW GUIDANCE FOR SEAFARERS ON AVOIDING LIFE BOAT ACCIDENTS

BIMCO has developed new guidance for seafarers on the safe launching and recovery of lifeboats using fall preventer devices (FPDs), to reduce the number of seafarer fatalities and injuries.

Lifeboat accidents resulting in fatalities and serious injuries are all too frequent, despite efforts in recent years to reduce them. Most of the accidents happen in boats using conventional davits and on-load release systems. However, recently other parts of the suspension and lifting systems have been identified as points of failure too, particularly the wire rope falls on larger lifeboats.

The International Maritime Organization (IMO) recommends the use of

FPDs because so many recent lifeboat and rescue boat accidents have resulted in fatalities and injuries to seafarers. This constitutes an unacceptable risk and the use of FPDs is intended to be an interim measure to reduce this risk while new, safe IMO approved systems are developed. However, this process will take some years, and so FPDs are recommended for the intervening time until approval is secured.

The new guidance has been produced in a handy illustrated pamphlet titled: *Avoid Lifeboat Accidents*. It can be downloaded free of charge from the BIMCO website.

Aron Sorensen, Head of Maritime Technology & Regulation at BIMCO said: "We have seen too many accidents

with lifeboats resulting in fatalities and injuries. This pamphlet provides the master and crew with solid, experience-based advice on the use of fall preventer devices (FPDs) during lifeboat operations. We sincerely hope that this pamphlet can help to reduce and avoid such tragic accidents in the future".

The *Avoid Lifeboat Accidents* pamphlet gives clear guidance on how to prevent accidents with lifeboats and rescue boats equipped with on-load release systems. It advises whether additional precautions in the form of FPDs are appropriate, and if so, when and how to use them safely and effectively when launching and recovering the boat. Other failure devices, and new innovative hook systems are examined too.

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OLDENDORFF

Transshipment

Since OLDENDORFF initiated its first transshipment project in Turkey in 2002, this division has come a long way. The company has invested about US\$400 million in the segment and now runs seven projects, employing over 800 people. More than 150 million metric tonnes have been transshipped by OLDENDORFF CARRIERS thus far.

OLDENDORFF'S TRANSSHIPMENT DIVISION

OLDENDORFF's current annual volume of 30mtpa (million tonnes per annum) sets it apart from its competitors. It offers bespoke logistics solutions that result in substantial freight savings. Insufficient port facilities or a shallow draught does not mean that one has to use small ships with poor economics.

OLDENDORFF can transship customers' cargoes from or onto larger vessels, giving them a lower freight rate per tonne on long-haul trades. In some cases, transshipment solutions can also increase throughput or actually make a commodity competitive in the first place.

The company arranges the ocean transportation as well as the transshipment in a safe, cost-effective and environmentally friendly manner. It also assumes full responsibility for the entire package.

OLDENDORFF's task is to assist clients in achieving their goals by designing, building and operating an efficient system. Its dedicated team consists of material



handling experts, naval architects, engineers and captains.

SERVING THE ARABIAN GULF [FOUR TRANSLOADERS, FOUR BARGES, TWO TUGS]

OLDENDORFF transships around 12mtpa in the Arabian Gulf with four transloading vessels, four barges and two tugs. The first project started in 2007.

Under long-term CoAs (contracts of affreightment), OLDENDORFF transports iron ore from Brazil, Canada and Norway in Capesize vessels to an anchorage 40km offshore Abu Dhabi.

OLDENDORFF's Abu Dhabi-based

subsidiary OLDENDORFF CARRIERS Transshipment L.L.C, also performs offshore lightering of iron ore for clients in Bahrain, Saudi Arabia and Qatar. In deep water, its transloaders lighter 50–80,000 tonnes from Capesize bulk carriers. Both the Cape and the transloader then proceed to the port with a permissible draught, where they unload the iron ore.

Vessels used in the Gulf include: the *Alfred OLDENDORFF* and the *Antonie OLDENDORFF*, two 94,000dwt eco transloaders, which were built at Yangzijiang in China in 2015. They feature 3x52 metric tonne MacGregor cranes with

OLDENDORFF TRANSSHIPS 30MTPA AT SEVEN LOCATIONS

Location	Commodity	Since	Mtpa	Operation
Turkey	Coal	2002	3.5mtpa	Cape > Barges
Guyana	Bauxite	2006	1.0–3.0mtpa	Barges > Ultras
Abu Dhabi	Iron Ore	2007	6.0mtpa	Capes > Barges
Bahrain	Iron Ore	2012	3.5mtpa	Capes > Transloaders
Saudi Arabia	Iron Ore	2011	1.4–1.8mtpa	Capes > Transloaders
Qatar	Iron Ore	2014	1.0mtpa	Capes > Transloaders
Trinidad	Ore/Coal/Bauxite	2012	9.0–12.0mtpa	Panamax & Supra > Cape



45m outreach, EMS-Tech belts, two boom conveyors, bow/stern thrusters, 7,500KW auxiliary engines, 40-person accommodation and a dust collection system. The newbuildings are supplemented by other transloaders from time to time.

POWERING TURKEY [ONE PLATFORM, TWO BARGES, TWO TUGS]

In the Gulf of Iskenderun, two miles off the coast in deep water, OLDENDORFF operates the world's most productive floating coal transshipment terminal. It was designed to transship up to 50,000 metric tonnes per day. It was ordered in Poland in 2001 and put into operation in Turkey in November 2002, together with two German-built self-unloading barges and two Turkish-built pusher tugs.

Coal is brought in by Capesize bulk carriers, arriving primarily from Columbia and intended for a modern 1,300MW power station. The platform unloads the Capesize bulk carrier two miles offshore, using three Liebherr MPG cranes, which transfer the coal to a barge loading chute, using hoppers and conveyor belts. The barges are loaded between the transshipper's twin hulls.

The tugs push the barges to a jetty at the power station, where they self-unload directly into a receiving hopper at 2,500tph (tonnes per hour) in an environmentally friendly manner.

The system overcomes the 6m draft restriction at the jetty in the most economical way and saved the owners of the power station the enormous costs, time and logistics that would have been required to build a Capesize port.

HUB FOR THE AMERICAS [THREE FLOATING CRANES, THREE BOAT CREWS, TWO TUGS]

In Trinidad, OLDENDORFF established a multi-user, multi-commodity transshipment hub in 2012, handling iron ore, coal, bauxite and other cargoes.

The Gulf of Paria in Trinidad was selected because of deep sheltered water and proximity to draught-restricted ports. Major rivers in South America prohibit the loading of Capesize bulk carriers directly from mines on riverbanks. By using OLDENDORFF's hub in Trinidad, clients can enjoy ocean freight savings.

The company uses Supramax and Panamax vessels to load cargo at restricted ports, for example in the Amazon or Orinoco rivers, then transship the cargo into Capesize bulkers using four floating cranes. The Capesize vessels then perform the long voyage to Asia or the Middle East.

This one-stop shipping enables it to agree on a competitive 'through cost' shipping freight covering three key elements: the shuttle into Trinidad, the

transshipment operation, and long-haul ocean transportation.

Recently OLDENDORFF added a coal top-off service: Capesize bulk carriers are being part loaded in draught-restricted US Gulf ports and sent to Trinidad. Simultaneously, Supramax vessels are loaded in the US Gulf or US East Coast ports and sailed to Trinidad in order to top up the Capes before they commence their voyages to Asia. Again, thinking outside the box and offering specialized logistics solutions has reduced its client's freight bill.

BAUXITE DOWNRIVER [20 BARGES, ONE FLOATING CRANE, SEVEN TUGS, ONE JACK-UP DOCK, THREE CREW & PILOT BOATS]

In 2005, OLDENDORFF signed a long-term contract with a large industrial client for a bauxite transshipment operation on the Berbice River in Guyana.

Bauxite is barged 240km downstream from mines near Aroaima, using 20 purpose-built covered barges of 3,000dwt each, and seven tugs. The cargo is then transferred from the barges to ocean-going ships, a floating crane, as well as the ships' own gear. The company provides river transportation and transshipment services for between one and three million metric tonnes per annum. Due to restrictions in the mouth of the river, only vessels up to Ultramax size can be loaded. Bulk carriers arriving to load bauxite are assisted in the channel by OLDENDORFF's tugs and pilot boats. To maintain all its marine equipment in this remote location, it even operates its own jack-up drydock.

The efficient logistics provided by 32 floating units is both cost effective and environmentally friendly. The client was able to overcome extreme draught restrictions, in order to export the bauxite. OLDENDORFF Carriers usually also takes care of the onward transportation of the bauxite to the Ukraine, Ireland and the United States.





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Introducing a coal transshipment hub in South Vietnam

An alliance of three partners – Welhunt, OLDENDORFF Carriers and Haivan — will position a Floating Transfer Platform (FTP) in South Vietnam. This unit is capable of discharging and loading all bulk carriers up to and including Newcastlemax (210,000dwt) at a discharge rate of up to 25,000 metric tonnes per day. This platform will be the first and only multi-user facility in Vietnam and is specifically designed to be able to handle growing coal imports.

Vietnam is currently facing a significant challenge when receiving and exporting growing volumes of bulk cargoes due to shallow ports and relatively poor port infrastructure. Coal imports, in particular, have grown more than 100% per annum from 2010 to 2017 and the total volume of coal imported is projected to reach 60mtpa (million tonnes per annum) by 2025.

Three strong Partners (Welhunt, OLDENDORFF and Haivanship) have teamed-up to provide a seamless, cost-effective and reliable integrated coal logistics solution for Vietnam-based customers.

This door-to-door coal delivery solution will take away much of the transportation risk from its clients and provide a reliable and cost-effective logistic solution to meet the coal import needs of Vietnam.

BRIEF PROFILES OF COMPANIES

Welhunt

Welhunt is an international integrated trading house with exposures in metal, agricultural and energy business worldwide. Welhunt is currently the largest coal importer into Vietnam, delivering over three million tonnes of coal per annum to this market alone. It will continue its focus and commitment to the Vietnam market with future expansions and investments.

OLDENDORFF Carriers GmbH & Co KG

OLDENDORFF Carriers is a family owned dry bulk shipping company normally operating a fleet of over 600 vessels. The fleet ranges in size from Handysize (35,000dwt) up to Newcastlemax (210,000dwt). In 2013, OLDENDORFF Carriers embarked on a newbuilding programme with over 50 eco-ships under construction or recently delivered. The company operates seven transshipment operations worldwide handling in excess of 30mtpa.

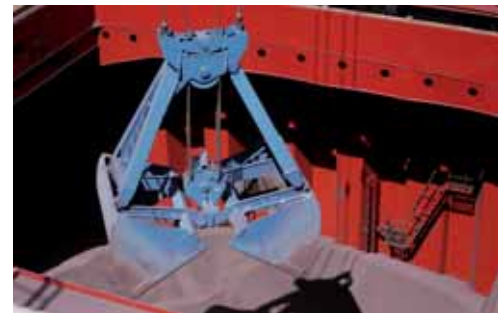
Haivanship

Haivan Shipping Services Corporation (Haivanship) is a Vietnamese private company providing domestic waterway transportation services. Haivanship operates its owned facilities — including barges, tugboats, midstream buoys and stevedoring — offering its clients a full set of services to dispatch large ocean going vessels quickly and smoothly. **DCi**





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Tonnage on track for another record-breaking year at the Port of Longview

On the heels of a record-setting 2016, the Port of Longview in the USA continues to demonstrate its cargo-handling expertise with another strong performance for the first half of 2017. The port's mid-year cargo volume of 5.2mt (million metric tonnes) is up nearly 10% above last year's volumes from the same time period.

As of August 2017, the port has seen significant increases in bulk agriculture exports, bulk minerals and logs. Upwards



of 300,000 metric tonnes of bulk minerals have been exported, a 56% increase. Additionally, more than 300,000 board feet of logs have been exported to Asian markets, an uptick of about 18% from 2016 mid-year reports.

EGT, the port's export grain terminal, has shipped out over 4mt of bulk agriculture products to date, an increase of 36% over this time in 2016. These increases can be credited to significant tonnage increases in both soybean and corn exports over the past year.

"In recent years, we have seen a trend of healthy volume growth. As we continue to diversify our cargo portfolio and expand our facilities, our expectations grow with them," said the port's Chief Executive Officer Norm Krehbiel. "We've gained significant momentum and we're able to capitalize on that due to our ability to meet a wide range of needs for our customers."

With bulk tonnage on the rise and breakbulk and project cargo continuing to move across the docks, the port is in a strong position to maintain this momentum through the end of the year.

Mejillones starts containerized minerals concentrates trade

As of 10 July 2017, the Chilean Port of Mejillones has introduced a minerals loading system based around flip-up containers. According to its managing director, Gabriel García-Huidobro, this will allow the port to double the number of such boxes that it dispatches.

The containers are loaded with copper concentrates and other minerals. Concentrates have been handled by the port for more than ten years, but this new technology should allow significantly greater quantities to be handled. The use of these containers has been driven by industry, noted García-Huidobro, so the

port must change with the times, as well as maintaining existing methods of handling concentrates.

"Over time, the flip-top container has become standardized as a means of transport, which makes it possible for customers to use such containers in different parts of their logistics chain," he says.

Quizzed as to whether the drop in price of raw materials in 2016 had impacted the port, García-Huidobro says it didn't have a great impact, although prices have begun to recover.

The movement of sulphuric acid,

however, did decline in comparison to levels in the two previous years. That had been directly linked to the production of copper and mining.

Other dry bulks traffic that Mejillones handles remain relatively stable. Indeed, mineral concentrates from Bolivia are actually up in 2017. He therefore remains confident about traffic for the rest of the year.

In terms of a plan to develop the Mejillones Port Complex (CPM) as a logistics port hub, the key factor remains getting customs facilities in place.

Barry Cross

Vietnam to build southern transshipment coal port

Vietnam's Deputy Prime Minister, Trinh Dinh Dung, has given his blessing to the proposed coal port in the country's southern region.

The Ministry of Industry and Trade and the Ministry of Transport will now head a task force that will produce a construction feasibility report.

The proposed port will move coal to thermo-electricity power plants in the C u Long (Mekong) Delta region.

Vietnam's national electricity development master plan states that the Mekong Delta region will have seven major thermo-power centres, which will include facilities at Long Phú, Sông Hau, Duyên Hai, Bac Liêu, An Giang, Kiên Luong and Tien Giang.

It is calculated that demand for imported coal for electricity generation will be approximately 11mt (million tonnes) by 2020 and 22mt by 2025. Demand would also increase to 43mt by 2030.

To date, local coal resources have been concentrated in the northeastern province of Quang Ninh, which mainly serve four generating stations in the northern and central provinces. BC

New coal terminal for Paradip

A Kakinada Seaports Ltd-led consortium has been awarded a concession to develop and operate a coal handling terminal at Paradip Port, in Orissa, for 30 years.

Its bid contained the highest revenue share price bid in a re-tender for the project.

The consortium, which consists of Kakinada Seaports Ltd, Bothra Shipping Services Pvt Ltd and Ripley & Co offered a revenue share price bid of 36.53%. The terminal will have a coking coal dispatch capacity of 10 million tonnes, once operational, according to Paradip Port Trust Deputy Chairman N Vajaypuri.

"The Kakinada Seaports consortium has been issued a letter of award (LoA) for the project after the board of trustees cleared the highest price bid submitted by the group," said Vajaypuri.

The consortium said that the terminal will cost an estimated \$10.229 million to develop. BC

Gramosa awarded new Veracruz port agribulk terminal concession

Gramosa Agroalimentos was the unique surviving bidder for the Terminal de Granel Agrícola (Agribulk Terminal) for the new Veracruz Port, given that the only other interested party was disqualified for putting forward a non-compliant bid.

Gramosa bid with an offer of \$12.69 million plus VAT. Its technical bid was viewed as equal to that of its competitor, whose financial bid did not however meet the terms and conditions laid out in the tender.

The other consortium had been put together by Grupo Comercializadora Portimex, Graneles Agrícolas de Veracruz, Comercialización de Energéticos, Aceites, Combustibles de Veracruz, Graneles Agrícolas Intercon and Intalgrani.

The new public terminal will cover an area of 100,002 square metres and be accessed through a 300-metre long quay. This land will be infilled from the sea. Any agribulk product can be handled there, as well as liquids derivatives. BC

Rotterdam: 'Building a Sustainable Port'

The Port of Rotterdam Authority recently launched a new campaign: 'Building a Sustainable Port'. "Sustainability involves more than just the environment. We have committed to a large number of initiatives and we will gladly present them," says Port Authority CEO Allard Castelein.

The Port Authority works hard to ensure that Rotterdam's port and the surrounding area are safe, healthy and attractive. Castelein: "Building a sustainable port means working to create economic and social value."

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In recent years, there have been significant changes in the structure and volume of bulk cargo transshipment cargoes to be processed by sea port terminals. Transshipment volumes of such traditional cargo like coal have fallen, due to unstable prices for energy sources. However, the transshipment volume of renewable fuels, i.e. wood pellets, wood chips and RDF, is growing. At the political level, Russia has decided to relocate export cargo flows to its own national ports, and this is, if we are talking about bulk cargoes, millions of tonnes of coal and mineral fertilizers.

Versatile and flexible operation, as well as reduction of costs of each tonne to be transhipped are of vital importance for sea terminals under such hard conditions. We must also not forget the ever-increasing demands for environmental protection, reduction of emissions and energy efficiency.

These rather complicated issues are experienced now by the clients of LNK Industries. LNK Industries works in the construction and manufacturing sector, offering a full construction cycle, including

design, provision of optimal and unique engineering solutions, construction of complex facilities as well as manufacturing of technological cargo handling equipment. In addition, the company has experience in construction of hydrotechnical objects and bridges.

Production of reinforced concrete and metal structures, production of non-standard transport, technological plants and automatic equipment allow LNK Industries to offer an end-to-end cycle of works from the construction of manufacturing, transshipment, etc. facilities to manufacturing of technological equipment. For that reason, LNK Group is able to offer end-to-end cycle products for marine terminals, production complexes and 'smart' buildings.

To the best of its knowledge, LNK Industries has no local competitors in the field of the turnkey projects (design, construction, manufacturing and installation of the equipment, automation) for the marine terminals. Usually there is a split between the equipment and the construction parts that are done by totally



different companies. All this, in turn, leads to problems with warranties and functioning, since neither builders nor equipment manufacturers understand and are motivated to co-ordinate the mutual solutions or work together. LNK

Industries, which has a highly qualified team in house, releases the client from the headache mentioned above.

All the above allows the company to offer optimal solutions to its clients. These solutions are in high demand, especially in the volatile conditions of today's bulk cargo transshipment market.

CASE STUDY: PORT OF RIGA

One particularly notable project for LNK Industries is the multi-functional bulk cargo terminal which its implemented in the Port of Riga in Latvia.

Initially, the client planned to create an import terminal to transship only two types of cargo — alumina, milled and raw sugar. The total volume of transshipment was not supposed to exceed 1mt (million tonnes) per year. Cargoes were planned to be transshipped from vessels to railway transport. The cargo processing technology developed by the experts at LNK Industries for this project offered some innovative technical solutions. These are detailed below.

Vessels are unloaded by the portal crane with grab buckets. Initially, taking into account the fact that alumina and raw sugar are technologically incompatible, all the transporting equipment was divided into two main flows. The portal crane has two receiving hoppers — each one is designed for a specific type of cargo. A crane's hoppers are joined with two belt conveyors which are located on the quay. Belt conveyors have a special enclosure system to protect them from atmospheric precipitations and wind.

Given the specific peculiarities of alumina and agricultural cargoes, both onshore conveyors have different accessories. For example, the belt conveyor for soybean milled/raw sugar



involved using an oil-resistant belt and explosion-proof rollers. Alumina, in turn, produces much dust and is highly abrasive, therefore the second line has special seals and wear-preventative coating for all points where cargoes are re-poured. All conveyors have airtight enclosures to prevent dusting and protect cargoes from damage which may be caused by precipitations.

From the onshore conveyors, cargoes are transferred by separate conveyor lines to the specialized sites for loading to railcars with intermediate storage in buffer hoppers. Railcars are loaded automatically.

Loading of alumina into railcars involved a special cargo aeration system which allows cargoes to be loaded into cars more fully.

To prevent dusting, cargoes are loaded into cars through telescopic chutes with built-in aspiration. Precise automated loading is provided by the railcar weighing system with railcar number detection.

However, due to changes in the bulk cargo market, significant modifications had to be implemented when construction works were already under way. These

modifications were associated with an increase in the quantity of cargoes to be processed, increased productivity of the terminal up to 2mt and the need to organize export transshipment. Since LNK Industries was an EPC contractor in this project, it was possible to quickly adjust the project which was already at the stage of construction of the terminal's facilities without stopping the main works.

The conveyor's incline angle was adjusted by moving it to horizontal in order to allow for the transshipment of grain. This involved changing the conveyor route and modifying the metal structure of the loading station. Additional dust suppression and cargo weighing systems were also installed directly on the conveyor.

The terminal was expanded with a railcar unloading station and mobile conveyors driven by wheeled chassis to load cargoes directly into cargo holds of vessels. Receiving hoppers allow processing hopper cars of any kind, as well as transshipping such cargoes as grain, press cake, mineral fertilizers and wood pellets and chips.

As a result of the modifications implemented in this project, the client was able to adapt to changes in cargo flows (including seasonal cargoes) and significantly extend the range of services.

The uniqueness of LNK Industries derives from the fact that the company is successfully able to fulfil complicated design and construction assignments by relying solely on its internal resources. Therefore, the company can guarantee the high quality of all construction elements and technological equipment, ensure timely performance of jobs and assume responsibility for compliance with financial liabilities.

LNK Industries implements projects not only in Latvia, but also in other European Union and CIS countries.



Millard Maritime

handling bulk on the US Gulf since 2013



Millard Maritime operates a deep water port facility, centrally located on the US Gulf coast, featuring a multi-berth large marine terminal boasting a 1,600ft wharf, with export and import capabilities for all types of bulk material. Direct on-site Class 1 rail and short truck transit to US Interstate Highways, I-10 and I-65, allow for efficient access to and from the southeastern United States and beyond.

Millard's experience in handling dry bulk including fertilizers, salt, iron ore fines, multiple pelletized cargoes, forestry products and various aggregates requires expertise in operating many types of equipment.

Actively used today are Superior brand mobile conveyors, related receiving hoppers and ship loaders, multiple brands of front-end loaders and excavation machines, various types and sizes of fork lifts along with a host of transit trucks and specialized built-to-suit options enabling best productivity solutions for the business.

Long term partners include Helm Fertilizer Company and a multi-national bulk cargo owner/distributor which will be named in the first quarter of next year.

COMPANY AND SITE HISTORY

Millard Maritime is privately owned by the Larsen Family. Founded in 1963, Millard Refrigerated Services became the second-largest cold storage provider in North America. Millard Refrigerated Services was sold in April 2014 and Millard Maritime was

retained as a core investment of Pierce Street Capital (the Larsen family office).

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

FACILITY HIGHLIGHTS

- ❖ 40 ft. draught
- ❖ 1,600ft of seawall
- ❖ 350 ft of mooring pier
- ❖ 290+ acres development land
- ❖ 240,000ft² warehouse
- ❖ direct rail access (CSX) – daily service, 90+ car storage
- ❖ 80,000ft² (40,000-tonne storage capacity) dry bulk warehouse (fertilizer)
- ❖ 6,000,000 gallon liquid storage tank

UNDER CONSTRUCTION

- ❖ 110,000ft² (65,000-tonne storage capacity) dry bulk warehouses
- ❖ barge loading, rail loading, truck loading
- ❖ industrial dryer

CORE COMPETENCIES

Millard Maritime has no outside investors or shareholders. Its objective is the creation of sustainable, long-term value — it believes that good customer relationships are measured in decades. A flexible and creative approach is key to structuring solutions to meet customer needs.

Millard Maritime offers excellent operational expertise in handling liquid and dry bulk — the average employee tenure is 7.5 years. It also has engineering and construction expertise.

DEVELOPMENT OPPORTUNITIES

Millard Maritime's 300 acres of multi-use land is available for mutually beneficial opportunities. Expansion phases include:

- ❖ build to suit/lease/joint venture;
- ❖ unit train switchyard;
- ❖ tank farm; and



- ❖ bulk dry cargoes (indoor and outdoor storage).

ON-DOCK WAREHOUSE

Millard Maritime operates the largest available waterfront inside storage facility in the Mobile Bay. The 242,000ft² warehouse is a mere 75 feet from the seawall, allowing for efficient vessel discharge and load operations to and from protected, dry, well insulated storage. Floor capacity to accommodate break bulk cargo is supported by:

- ❖ six inches of concrete;
- ❖ eight inches of hard foam insulation: 1.5lb. EPS insulation;
- ❖ #4 rebar set 18 inches on centre; and
- ❖ 1,000 PSF (pounds per square foot) load capacity.

Three dock doors enable covered railcar loading and unloading. Millard Maritime is also willing to make structural improvements to the warehouse to accommodate certain long-term business opportunities.



CUSTOMER FOCUS

Millard Maritime customizes each service engagement with shippers, for maximum customer value. In addition to warehousing, the facility offers high-quality export and import expertise in cross-dock or transloading operations. The site is a TWIC facility, governed by the US Coast



Guard and Homeland Security offering fenced in storage with 24 hour per day monitoring. Experienced 'in-house' warehousing and stevedoring capabilities enhance the customer experience, as does the full inventory control system.

Millard Maritime has everything for a great shipping experience, including:

- ❖ shipper focus;
- ❖ proven safety record;
- ❖ experienced management;
- ❖ highly skilled personnel;
- ❖ sustainable business practices; and
- ❖ a win-win business approach.



VIGAN invests for the future

In order to better serve its customers and to be prepared for the future, major equipment supplier VIGAN is extending its manufacturing facility in Nivelles, Belgium, with a major extension of its pre-assembly hall.

A complete pre-assembly of all ship-unloaders and shiploaders is essential to guarantee quality and to prepare the future commissioning of the equipment at the customer's site. VIGAN is committed to controlling the value chain from A to Z in its own facility, with its own qualified and experienced workforce: engineering, manufacturing, pre-assembly and testing, erection and commissioning, after-sales support.

Today, grain operators are handling bigger vessels, up to post-Panamax size at higher capacities. VIGAN continues investing in R&D and manufacturing facilities to offer handling equipment in line with market demand.

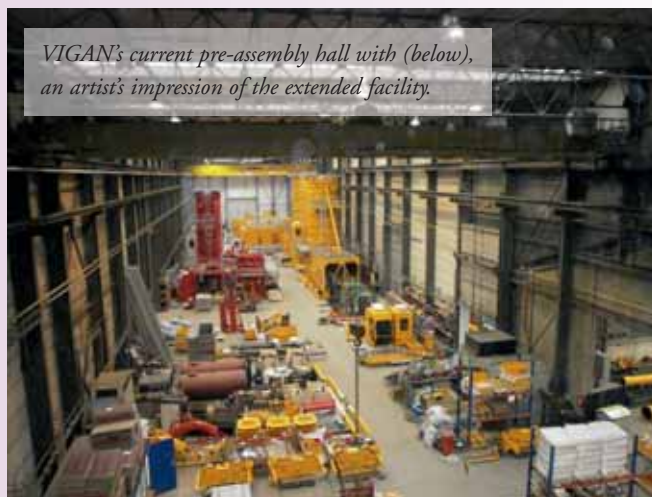
Today, all of VIGAN's activities take place on the same 10,000m² site in Nivelles, 30km south of Brussels. The use of the same location enables easy exchange of information among all departments including sales, engineering, manufacturing, quality control and after-sales technical assistance.

The current assembly hall of 50m x 20m span will soon be extended by an additional hall of 70m x 30m span, with lifting capacity of up to 50 tonnes.

In 2015, VIGAN installed 1,000 solar panels. This new hall roof is giving space for an additional 1,000 panels producing around 30% of the factory's total need.

Work on the hall extension is due to begin in October 2017 and should end in May 2018, in time to coincide with VIGAN's 50th anniversary celebrations!

VIGAN's current pre-assembly hall with (below), an artist's impression of the extended facility.



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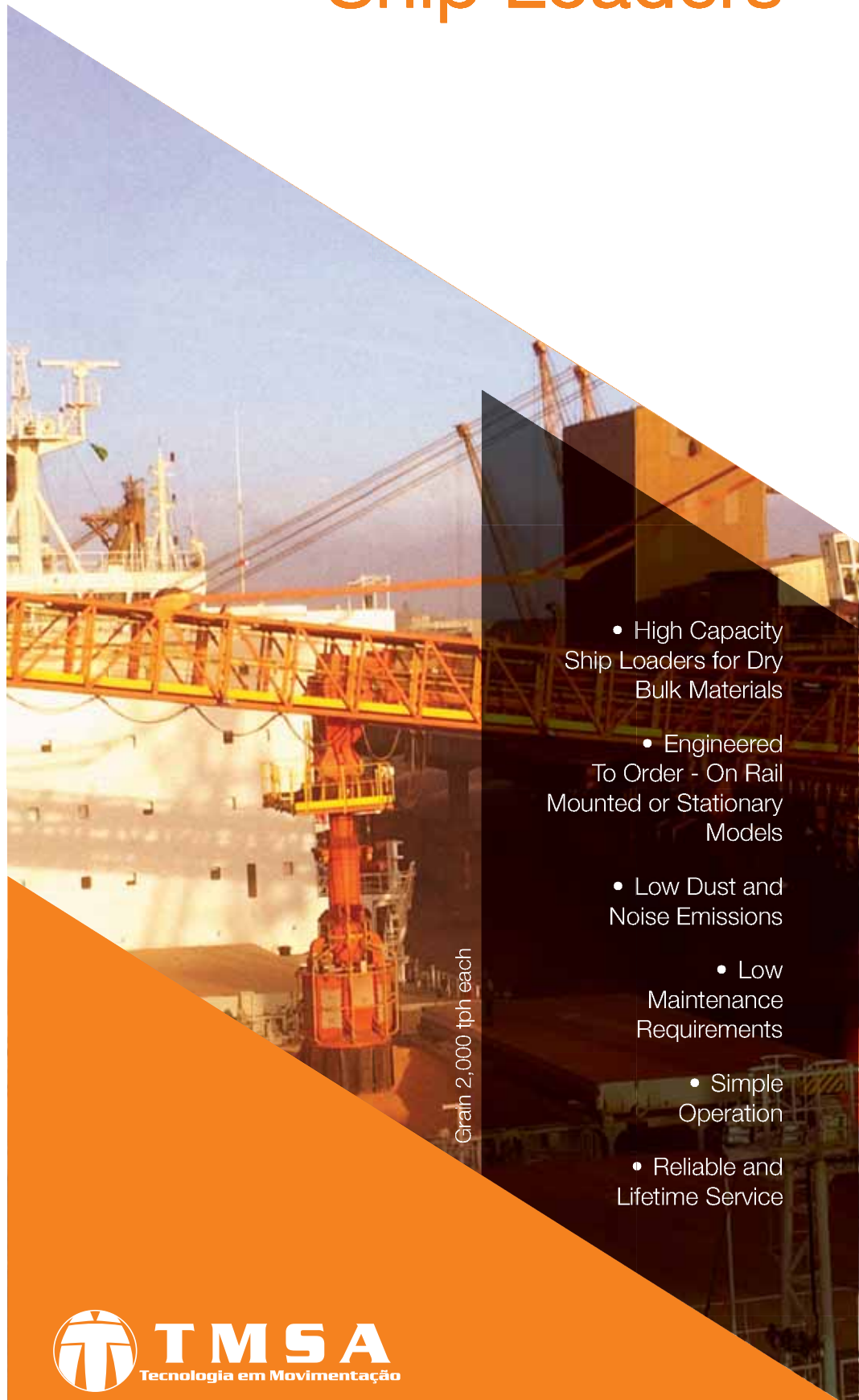
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Shunting solution from Vollert offers road/rail flexibility

INNOVATIVE VLEX 2-WAY ROBOT FOR RAIL AND ROAD: COMPACT WITH SMART STEERING

Vollert has recently developed its VLEX road-rail robot, which offers a high-quality solution for shunting operations of up to 300 tonnes. Extremely compact and flexible, battery-driven and exhaust-free, the small VLEX is suitable to change tracks fast in a very confined space.

Shunting operations can pose time-consuming challenges — even more so in enclosed storage or production areas. Rail-bound solutions alone are often not flexible enough. The new VLEX road-rail robot from Vollert quickly and easily changes from track to road — or straight to the power outlet as it has a battery-driven electric drive. “As a specialist for economical in-plant shunting and transport systems, we were always approached on the subject of a small two-way, road-rail, solution, so we have been working on the development full-scale,” explains Jürgen Schiemer, Vice President Shunting Systems at Vollert.

Compact, flexible, battery-driven and exhaust-free: Vollert's innovative VLEX road-rail robot is an optimal solution for easy shunting operations of up to 300 tonnes on rail and road.



ARTICULATED STEERING FOR MANOEUVRABILITY AND FLEXIBILITY

Many shunting systems are clumsy or involve high wear and tear. The newly developed VLEX features a very special type of articulated steering. The radio-controlled road-rail robot is driven by four individual wheel hub motors. Steering takes place over the speed control of the wheels, so there is no need for the commonly used steering cylinders. It is compact and extremely flexible and thus an economical alternative to other shunting solutions. The ingenious vehicle geometry — combined with the innovative steering control system — allows for turning radiuses of 7.2m that are gentle to the tyres and low-wear. Also, a 360° turn-on-the-spot is feasible, if space is very confined.

BUMPY GROUND AND SMALL OBSTACLES: PRESENT NO PROBLEM

One of the chassis axles is a swing axle. This ensures that all four drive wheels always maintain maximum contact with the ground during rail and road travel, and exploit their full force. The vehicle can therefore cope easily with smaller obstacles, as well as chuckholes, without any loss of structural stability and traction even on load-bearing unpaved terrain. Track guide rollers are hydraulically lowered for rail travel. The hydraulic system also ensures that the track guiding units automatically readjust themselves and counterbalance each other. The steering can be hydraulically locked for the required stability during travel. Solid rubber tyres ensure optimum traction, which is also supported by the high dead weight of 4.5 tonnes. Thus, wagons of up to 300 tonnes can be moved.

REMOTE CONTROL WITH INNOVATIVE COLOUR SYSTEM

The joystick remote control is particularly straightforward thanks to a novel colour system: steering and travel direction as well as lowering the track rollers are operated intuitively and without the need for major training measures by means of colour-coded buttons. The road-rail robot can be safely controlled under all operating conditions thanks to the high coverage range. In the majority of the European Union, the radio frequency (433/434MHz) is not subject to registration or approval. “With its high manoeuvrability, high traction and intelligent drive technology with a pulling force of 20kN, the road-rail robot can be employed in all shunting operations and is easily and safely operated by one person,” says Jürgen Schiemer.

“Another very important point: access to all relevant components as well as for battery replacement is possible through large gull-wing doors at any time. This makes maintaining the road-rail robot very easy.”

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thyssenkrupp conveyor system for copper mine

RELIABLE AND COST-EFFECTIVE: THYSSENKRUPP TO DELIVER CONVEYOR SYSTEM FOR NEW UNDERGROUND COPPER MINE IN MONGOLIA

One of the richest underground copper deposits in the world will soon be accessed with the help of high-capacity gearless driven conveyors from thyssenkrupp. As a major global provider of mining systems, the Industrial Solutions business area has won a contract to supply a material handling system for the new Oyu Tolgoi underground mine in Mongolia. The contract value is in the higher double-digit million euro range. thyssenkrupp will supply a total of nine conveyors with a combined length of 9.5km as well as seven transfer towers operating at a design tonnage of 7,100 tonnes per hour. First production from underground is expected in 2020. The Oyu Tolgoi mine complex is a joint venture between the government of Mongolia and Turquoise Hill Resources,

which is majority-owned by Rio Tinto. From a depth of nearly 1,400m beneath the Gobi Desert in the south of Mongolia, the new underground material handling system is planned to transport 95,000 tonnes per day of copper ore up to the surface. The main components are four high lift conveyors each equipped with 1.6m-wide steel cord belts and dual

5,500kW gearless drives from Siemens. Further conveyors will feed the main incline conveyors and tie the new underground system into the existing process facility.

Torsten Gerlach, CEO of the Mining Technologies business unit of thyssenkrupp Industrial Solutions: "This order again proves that thyssenkrupp is a strong player in the mining and materials handling industry. We are proud to contribute to this project with our intelligent belt conveyor technology and our strong global project execution capabilities. The system will help the Oyu Tolgoi mine set standards in terms of productivity and safety."

The Oyu Tolgoi mine began producing copper concentrate from an open pit operation in 2013. The future underground construction activities will transform Oyu Tolgoi into one of the most significant copper mines globally.



*Torsten Gerlach,
CEO of the
Mining
Technologies
business unit of
thyssenkrupp
Industrial
Solutions.*



NEW CONVEYOR SYSTEM REDUCES MAINTENANCE AND DOWNTIME

The order given to thyssenkrupp includes the engineering, design, and supply of the new material handling system as well as required site support services during the construction and commissioning phases. It will be designed with an emphasis on ease of maintenance. This includes, for example, the ability to quickly replace chute sections as well as idler rolls and belt cleaners. The drive components are massive in terms of size and weight, so great attention will be paid to safely transporting them underground and to ensuring they can be safely exchanged in the future. Overhead bridge cranes are strategically located to not only service the equipment, but also to aid in the erection of the major structures.

The work scope also includes water and air piping for the required dust suppression equipment, fire protection along all of the underground conveyors and electrical infrastructure to control and power the equipment.

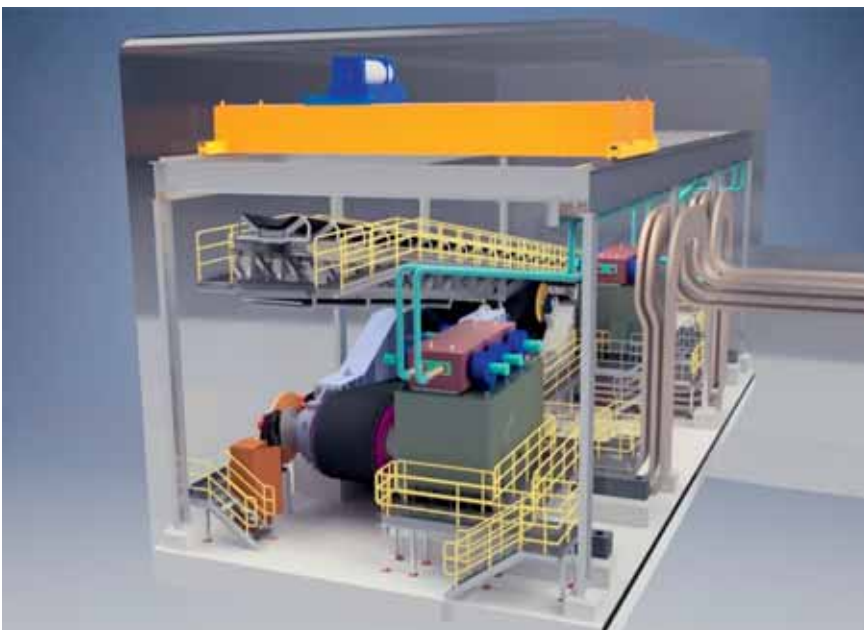


ABOUT THYSSENKRUPP

The Industrial Solutions business area at thyssenkrupp is renowned for the engineering, construction and service of industrial plants and systems. Based on more than 200 years of experience, it

supplies tailored, turnkey plants and components for customers in the chemical, fertilizer, cement, mining and steel industries. As a system partner to the automotive, aerospace and naval sectors, it develops highly specialized solutions to meet the individual requirements of its customers.

More than 21,000 employees at over 70 locations form a global network with a technology portfolio that guarantees maximum productivity and cost-efficiency. The Mining Technologies business unit supplies a full range of machinery, systems, equipment and services for the extraction, processing, storage and transportation of raw materials. In collaboration with its customers in the mining and minerals sectors worldwide, thyssenkrupp develops custom, forward-looking solutions that enhance productivity and allow natural resources to be used responsibly and efficiently.



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Tenova TAKRAF continues to set new benchmarks in belt pulley fabrication



A contract covering the supply of an approximately 13km-long belt conveyor system was recently awarded by a globally renowned Chilean mining company to TAKRAF. The scope of work includes, among others, the design, fabrication and supply of 39 belt pulleys (source: TAKRAF).

With headquarters in Leipzig (Germany), TAKRAF is a leading global solutions provider in the mining, bulk material handling and minerals processing industries. The company is also an important manufacturer of high-end components such as belt pulleys and boasts a strong reputation in this area.

A contract covering the supply of an approximately 13km-long belt conveyor system was recently awarded by a globally renowned Chilean mining company to TAKRAF. This belt conveyor system will be installed in a copper mine in northern Chile. The scope of work includes, among others, the design, fabrication and supply of 39 belt pulleys specifically developed for

this project. All pulleys are being fabricated at the TAKRAF workshop in Lauchhammer (Germany).

TAKRAF's position as a major global supplier in the engineering and fabrication of belt pulleys enabled it to meet the stringent requirements of supplying highly-stressed drive and return belt pulleys with a maximum diameter of 2.8m and single weights of up to 60 tonnes. Many of these pulleys will drive and handle the strongest steel-cord belt ever employed globally. The various challenges associated with such a project have been overcome by a dedicated team of highly skilled and experienced engineers and workers.

At the time of writing, 26 of the 39

pulleys had already left the Lauchhammer works, by means of heavy load road transportation with associated special permits; while the final belt pulleys will commence their journey to Chile at the end of August.

This extraordinary belt conveyor system, proudly supplied by TAKRAF with belt pulleys designed and made in Germany, will represent a major pillar of Chilean copper production for many years to come.

TENOVA TAKRAF

Tenova TAKRAF is an integrated solutions provider to the global mining, bulk material handling and minerals industries, offering innovative technological solutions as well as process and commodity knowledge along the industry value chains. With the integration of the well-known DELKOR brand of products into TAKRAF, the offered portfolio for the mineral beneficiation and processing sectors has been considerably enhanced.

Tenova is a worldwide supplier of advanced technologies, products, and engineering services for the mining and metals industries.

Twenty six of the 39 pulleys have already left the Lauchhammer works, by means of heavy load road transportation with associated special permits (source: TAKRAF).



Rulmeca strengthens pulley offering with acquisition of CPM in South Africa

The Rulmeca Group, a renowned global provider of conveyor components (rollers, idlers, structure, motorized pulleys and pulleys, is expanding its worldwide presence in the conveyor pulley business for bulk materials handling.

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

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

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

The managing director of Melco, Danie O'Connell welcomes all existing employees of CPM into the Melco Team stating, "It is significant for Melco to make this agreement with CPM's owners and we are ready to invest in this business to improve further capacity and service to our customers." O'Connell continues: "The product range of CPM's quality is already excellent. We shall invest in people, machinery and space to further build on existing strengths and ensure that the pulley range fits in well with our range of rollers, idlers and structure which are well integrated into the market."

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

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

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REMA TIP TOP provides maintenance and service for Rhenish lignite mining area

Conveyors with a total length of 250km are in operation at the three open-pit mining sites in the Rhenish lignite mining area (source: RWE)



REMA TIP TOP PROVIDES SERVICES AND PRODUCTS FOR THREE RWE POWER OPEN-PIT MINING SITES IN THE RHENISH LIGNITE MINING AREA

RWE Power now exclusively relies on REMA TIP TOP for the repair and maintenance of the steel cord conveyor belts in its conveyor systems, which transport millions of tonnes of coal and excavation material from the open-pit mining sites in the Rhenish lignite mining in Germany area every year. A new service contract covers services that are to be provided by 120 employees over a period of ten years on-site.

REMA TIP TOP, a global system provider of services and products for conveyor and processing technology, has won the contract for the exclusive vulcanization of the conveyor systems for the transport of brown coal and excavation material at the open-pit mining sites of Inden, Hambach, and Garzweiler. The service contract has a term of ten years. It comprises on-site support for the open-pit mining operations and will be carried out by 120 locally employed service staff, who will be quickly

available 24/7 from their conveniently located branch office in Elsdorf-Desdorf.

RELIABLE PARTNERSHIP FOR DECADES

“Since the 1950s, we have been seeing to the safe and reliable operation of the open-pit mining facilities in the Rhenish lignite mining area,” said Bernd Schimmack, Managing Director of REMA TIP TOP Desdorf. “We are constantly developing technical standards, but also safe and effective workflows together with RWE Power.” With the signing of the new contract, REMA TIP TOP has the sole long-term responsibility for the complete repair and maintenance of the vulcanization operations of the conveyor systems at three sites. “Providing an entire range of services, from the product through to the installation to sustainable service, corresponds exactly to our strategy: everything from a single source and in the highest quality,” said Thorsten Wach, CEO of the REMA TIP TOP Corporation.

The idea of providing all of the services for vulcanization in order to simplify procedures had already been introduced in 2014. At that time, several different service

providers were responsible for the numerous services. REMA TIP TOP was able to win the corresponding tender for a limited period through 2017. With the now signed follow-up contract, RWE Power has shown its approval of the services rendered by REMA TIP TOP during that period. “We are very satisfied with the maintenance and support of our conveyor systems, and would like to continue to promote this development together with REMA TIP TOP,” said Dr Stephan Strunk, Section Manager of the Opencast Mining Department at RWE Power. “In this region, RWE places orders with a scale of about €800 million each year, often to long-standing partners. For many years, REMA TIP TOP has been among those who provide us with services and products. We are very pleased to continue this reliable partnership.”

FOCUS ON SMOOTH AND TROUBLE-FREE OPERATIONS

The smooth and trouble-free operation of the conveyor systems is one of the most important prerequisites for reliable power generation and processing of the extracted brown coal — and thus also for the supply of energy for the region. If a conveyor belt

fails, the entire operation quickly comes to a halt. It is therefore crucial to recognize wear and tear as early as possible before a failure occurs, in order to be able to schedule maintenance periods in a targeted manner. If any damage suddenly occurs, it needs to be repaired as soon as possible. The service team at REMA TIP TOP focuses on the entire material transport: the conveyor belts

on the conveyor lines and on large equipment (bucket wheel excavator and stacker) will be serviced, repaired, and renewed.

ABOUT REMA TIP TOP

REMA TIP TOP is a system supplier of services and products across the world for conveyor and processing technology and



The signing of the contract (from left): Bernd Schimmack (Managing Director, REMA TIP TOP Desdorf GmbH), Hans-Joachim Herzog, (Head of Purchasing, RWE Group), Patric Scheungraber (Member of the Board of Directors, REMA TIP TOP AG), Dr Stephan Strunk (Section Manager of the Opencast Mining Department, RWE Power AG), Hans-Jürgen Dralle (Head of Mechanical Engineering at the Technical Center at the opencast mines, RWE Power AG) (source: REMA TIP TOP).

for tyre repair. The company has a global service network, offering a broad spectrum of rubber products, rubber linings, and coatings for industrial and automotive uses. With almost 100 years of experience, REMA TIP TOP has collected a unique range of expertise in material development and industrial services. The company is active in the material processing, surface

protection, and automotive segments.

At the end of the 2016 fiscal year, REMA TIP TOP had generated revenues of nearly €900 million. The company has over 6,300 employees across the globe, with more than 140 subsidiaries and affiliated companies — including renowned brands like Dunlop Belting Products South Africa, Cobra/Depreux, and Asplit.

Tubular drag conveyor from Hapman

CUSTOM APPROACH ALLOWS HAPMAN TO INNOVATE FOR MATERIAL HANDLING

With headquarters located in Kalamazoo, MI, USA, Hapman is a global industry expert in material handling, offering a wide variety of products, including high quality tubular drag conveyors.

In addition to setting the industry bar for tubular drag conveyors, Hapman offers flexible screw conveyors, tubular drag conveyors, conveyor controls/automation, bulk bag unloaders, drag conveyors, vacuum conveyors, bulk bag fillers, dust collection, feeders, lump breakers, liquid/solid systems, bag compactors and bulk material handling systems.

THE ORIGINAL TUBULAR DRAG CONVEYOR

A solution to many conveying problems, the Hapman tubular drag conveyor is renowned for continuously moving a wide variety of materials reliably and effectively in any direction without dusting. This is especially useful when conveying needs require long distances, unique layout configurations, travel over multiple levels or requires numerous inlet/discharge points, Hapman's tubular drag conveyor is an ideal solution.

FEATURES:

- ❖ **Dust-free operation:** tubular drag's completely sealed construction confines materials to the process, while conveying materials in any direction — horizontally, vertically, at any angle and around corners — without dusting, odours, contamination or spillage.
- ❖ **Conveying speeds of up to 50cfm (1.416cmm):** a sprocket drive pulls a chain through a stationary outer casing. Flights attached at regular intervals along the chain convey material from inlet points to discharge points.
- ❖ **Longer life from chain than steel cable:** chain is less prone to fatigue, wear and stretch than steel cable. As individual parts on the chain wear out they can be replaced at lower costs and time expense than steel cables.
- ❖ **Minimal chain wear:** Heavy-duty chain allows the user to start the conveyor under full load.
- ❖ **Discharges 100% of product:** Hapman's exclusive, self-cleaning discharge gate is rounded to the shape of the pipe, so there is no place for product to get trapped.
- ❖ **Minimal maintenance:** The automatic

chain take-up idler makes adjustments as the chain stretches, requiring no manual tightening.

- ❖ **Eliminates multiple conveyors & multiple inlets/outlets:** install numerous inlets and/or discharge points into a single tubular drag conveyor. Then add ingredients and discharge product all along the way. Tubular construction lets the user reconfigure the design as the process needs or floor layout changes.
- ❖ **Low-horsepower:** the electric motor drives material for hundreds of feet using minimal energy.

Hapman equipment serves a number of applications and commodities, from chemical, food, polymers/plastics, research animal and building to minerals processing, power generation and wastewater treatment. Hapman clients are industrial medium-duty operations using custom-engineered equipment for challenges such as bulk material handling, dusting, batching, cleanability, degradation and segregation.

INNOVATIVE TECHNOLOGY

While much has been made about the leadership behind the tubular drag

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Save money with low energy costs
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Free Standing, Crawlers, Floating, Rail

"WHITE is the New **Green"**



conveyor, Hapman is also involved in some of the industry's most cutting-edge innovations, including the Industrial Internet of Things (IIoT).

Industrial operations are not immune to the era of 'big data.' Millions of tiny devices have been collecting and sending data automatically across the Internet for decades. Known as the Internet of Things (IoT), it is most evident in the use of 'smart' devices like phones, monitors and trackers that allow us to manage data from remote locations. The goal is to make our lives easier by providing insight and control over the things that affect us on a daily basis.

The ability to collect and analyse live data from machinery is a reality. Today's electronic and wireless technology make it possible — not to mention practical and affordable — to collect performance data as it happens in real time. Use of IIoT is a

modern way to boost productivity and improve the efficiency of equipment and operations. Hapman is now using small computers, sensors and wireless networks to proactively collect and analyse data across its customers' entire facilities.

There are many facets to an industrial process. Due to the complexity and crucial role in an operation's overall success, material handling systems can be especially challenging. The combination of these factors makes it difficult to:

- ❖ diagnose efficiency issues;
- ❖ find bottlenecks;
- ❖ identify optimum operational methods for specific applications; and
- ❖ endure unplanned downtime.

Use of IIoT positively impacts each one of the challenges as Hapman and DATTUS, creators of an IIoT platform for smart

factories and smart machines, work to bring technological intelligence to material handling. This partnership is quickly putting Hapman industrial customers ahead of the curve.

HAPMAN HISTORY

Henry Hapman invented the Tubular Drag Conveyor in 1945. The concept for the totally enclosed, multi-plane conveyor came from his industrial manufacturing experience as a mechanical engineer. The vision of Henry Hapman forever changed the manner in which dry material is moved in industrial production facilities. The engineering, design and material handling experience, coupled with the unyielding passion for efficient, reliable operation, are the elements that make the Hapman tubular drag conveyor the industry standard for modern manufacturing.

For more than 70 years, Hapman has been developing material handling solutions that keep materials moving. There are more than 10,000 Hapman installations worldwide in chemical, food, pharmaceutical, plastics, building, minerals and other industries. Each installation offers a distinct solution to specific conveyance needs, while delivering guaranteed performance results.

While Hapman has solved thousands of conveyance problems and designed innovative ways to move more than 2,600 distinct materials, the engineers and manufacturing staff never pull an idea off the shelf. Distinct solutions start by listening to client needs and then developing the ideas that move materials.



Powered conveyor belt tracker: continuous, precise adjustment

A new powered conveyor belt tracker from Martin Engineering delivers immediate and continuous precision adjustment of hard-to-track reversing conveyors, helping operators reduce spillage and extend the life of belts and other system components. Able to effectively centre the belt regardless of the travel direction, the robust unit has demonstrated greater durability and longer service life than

previous designs, translating to a reduced cost of ownership. Versatile enough to run on 110V/220V power or a plant's existing compressed air, the Martin® Tracker™ Reversing can even be specified with the company's unique Roll Gen™ System, which uses the kinetic energy of the moving belt to produce a supply of electricity sufficient to power sensors, scales, lights and other devices when no

power is readily available.

"Most reversing belt trackers use a paddle wheel or roller of some kind to move the actuator," explained Martin Engineering Product Development Engineer Andrew Timmerman. "Like anything mechanical, the more moving parts there are, the more opportunity for something to wear out. In comparison, this unit reduces the number of parts in a



The new belt tracker can be specified with either a pneumatic or electric actuator.

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For locations without electricity or plant air, the Roll Generator creates its own mini-power station.

A direction sensor determines which side of the unit should be actively tracking the belt.



rugged design, using either an air or electric actuator to reverse the working direction.” Engineered for reliability and longevity, the unit gives conveyor operators a new option for powering the tracker, allowing them to best suit their individual circumstances.

“We wanted to offer both types of actuator to meet the needs of virtually any location,” Timmerman continued. “The sensors communicate the pulley direction, sending a signal either to an electrical relay or a pneumatic solenoid to extend or retract the cylinder as needed, depending on which version is specified,” he explained.

For locations where no electricity or plant air is available, Martin Engineering designed the Roll Generator to serve as a self-contained mini power station. In those cases, the tracker uses an electric actuator to move the rolls and correct the belt’s position. The electric actuator is also used when 110/220V power is available from the plant. The Martin® Tracker™ Reversing is available in lower units for installation on the return side of the belt and upper units for use on the conveyor’s carrying side.

Martin Engineering is a global innovator in the bulk material handling industry, developing new solutions to common problems and participating in industry organizations to improve safety and productivity. The company’s series of Foundations books is an internationally-recognized resource for safety, maintenance and operations training, and employees take an active part in ASME, SME, VDI, CMA and CEMA. The firm also played a pivotal role in writing and producing the 7th edition of the CEMA reference book, Belt Conveyors for Bulk Materials. Martin Engineering products, sales, service and training are available from factory-owned business units in Australia, Brazil, China, France, Germany, India, Indonesia, Italy, Mexico, Peru, Russia, Spain, South Africa, Turkey and the UK.

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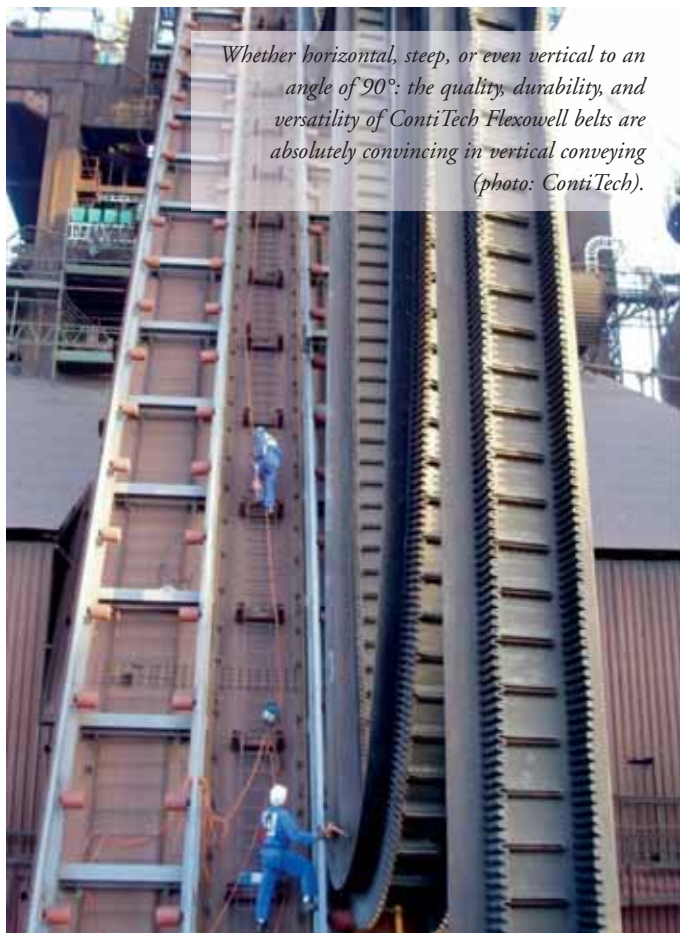
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Flexowell: ContiTech conveyor belt technology for efficient steep-angle conveying



Whether horizontal, steep, or even vertical to an angle of 90°: the quality, durability, and versatility of ContiTech Flexowell belts are absolutely convincing in vertical conveying (photo: ContiTech).

Whether horizontal, steep or even vertical to an angle of 90°: the quality, durability, and versatility of ContiTech Flexowell belts are absolutely convincing in vertical conveying. From raw coal to ore, stone, sand and grain, the conveyor belts can safely and efficiently transport any kind of bulk material vertically.

In 1964, Flexowell technology opened up a new dimension in the transport of bulk materials. Since then, it has made high-capacity, high-performance transport systems possible at reduced start-up and maintenance costs. "Among other things, our customers benefit from fast installation, reduced energy consumption, and quiet, environmentally friendly operation at capacities up to 6,000 tonnes an hour," stresses Dr. Michael Hofmann, head of the Industrial Belting Solutions at the ContiTech Conveyor Belt Group. In addition, the conveyor belts can be integrated into complex workflows with no further transfer points.

THE HIGHEST RELIABILITY IN ANY LOCATION

What's special about Flexowell? Inside a multi-gradient conveyor system, such as S conveyors, even multiple shifts from horizontal to vertical are possible with just one conveyor belt. Flexowell ensures the necessary cross-rigidity of the belt body through a special belt structure.

Altogether, the Flexowell belt is made of three components: a laterally stable fabric or steel cord base belt, corrugated sidewalls made of reinforced vulcanized rubber and tread bars arranged crosswise from the conveyor direction, which prevent the conveyed material from slipping. "Here we bet on high quality standards to ensure efficient conveying over a long period of time," says Benedikt

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In vertical conveying, the system reaches lifting heights up to 500m (1,640ft), has belt widths up to 2.4m and belt strength up to 10,000 Newtons per millimetre (photo: ContiTech).



Nothelle, head of Sales and Engineering Special Bulk Conveying.

QUALITY MADE IN GERMANY

The corrugated sidewalls and tread bars are vulcanized to the base belt. Depending on the type, the tread bars can be screwed to the corrugated sidewalls and easily replaced, when necessary. Corrugated sidewalls are available in heights from 40mm to 630mm and tread bars from 20mm to 600mm.

In relation to this belt design conveyed particle size of bulk material in the range of powdery, floury material up to 400mm (16in) can be handled easily with Flexowell conveyor systems. Examples include: flour, cement, lime, gypsum, ash, cereals, seeds, sand, gravel, coal, coke, quarry rocks, ore wood chips, iron ore pellets, domestic waste, limestone, and tunnel muck.

The system is made up of various belt types, rubber qualities, and the appropriate corrugated sidewalls and lug treads for the application intended. Conveyor belts come in six qualities, depending on the application: highly wear-resistant, grease- and oil-resistant, heat-resistant, or even self-extinguishing and flame-resistant per ISO340 or MSHA.

UNIQUE FEATURES OF FLEXOWELL BELTS

The Flexowell belt design includes unique features too: this includes the special cross-rigid ply for fabric belts and a special inner design of steelcord belts. The usage of a high proportion of natural rubber mixture ensures the flexibility of the belts. Since the base belts are pre-stretched, it prevents and reduces adjustments of the belts during operation. The special inner design of the

sidewalls prevents cracks. So longer lifetime of the sidewalls, means reduced repair or replacements. The result in reduced is the maintenance of costs. Flexowell also has a positive effect on the costs of operation by reducing potential downtime of the installation and thus preventing losses of production.

Furthermore, ContiTech supports customers like Engineering companies, OEM and end customers in design of the complete systems, optimization of the complete systems and offering a complete service on site.

Today, more than 60,000 systems around the world are equipped with Flexowell technology and used in quarries, mines, coal extraction, the chemical and steel industries and even tunnel construction. And there is good reason: In vertical conveying, the system reaches lifting heights up to 500m (1,640 ft), has belt widths up to 2.4m and belt strength up to 10,000 Newtons per millimetre.

COMPARISON: CONVENTIONAL CONVEYOR BELT VS FLEXOWELL BELT

Compared with conventional conveyor belts, the Flexowell system not only convinces with a quick installation, but also with architectural advantages and with lower investment costs — both for the system and property ground costs. In operation, it offers continuous conveying with a quiet run. Thus improving customer productivity. By reducing maintenance and inventory costs, it reduces total costs during a life cycle. The moderate electricity requirement also allows to reduce CO₂ emissions.

The comparison of the costs in relation

to the different systems above shows a total cost savings of approximately 30 to 40% using the vertical Flexowell system. Further comparisons Flexowell system vs discontinuous systems (skip hoist / trucks) show substantial total cost savings effect too.

CONTITECH

Continental develops pioneering technologies and services for sustainable and connected mobility of people and their goods. Founded in 1871, the technology company offers safe, efficient, intelligent and affordable solutions for vehicles, machines, traffic and transport. In 2016, Continental generated sales of €40.5 billion and currently employs more than 230,000 people in 56 countries.

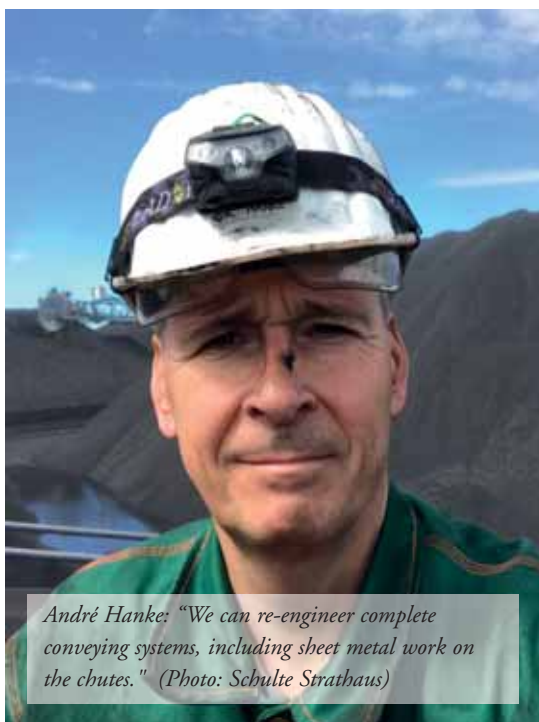
As a division in the Continental Corporation, ContiTech is a major global industrial specialist. Its customers can be found in key industries such as machine and plant engineering, mining, the agricultural industry, and the automotive industry. With around 46,000 employees in 44 countries, the company uses its development and material expertise for products and systems made of rubber, polyamide, metal, textile, and electronic components to combine these with individual services. ContiTech also offers functional and design-oriented living solutions and is always searching for customer-friendly and environmentally-friendly answers — going well and truly beyond its roots as a producer of rubber products. With sales of approximately €5.5 billion (2016), this international technology partner is active with core branches in Europe, Asia, North and South America.

Schulte Strathaus now offering integral solutions for conveyor belts

With the introduction of an in-house developed transfer point seal for belt conveyors, the German manufacturer Schulte Strathaus can now offer integral solutions for conveying systems.

"We want to be known as providers of integral solutions for conveying systems, not just as a scraper manufacturer," says André Hanke. The 47-year old is general manager of the Starclean division of F.E. Schulte Strathaus GmbH & Co. KG (Fess Group). He is responsible for all conveyor system products and services. "Before, we used to sell scrapers, tracking systems and impact beds," he explained. With the addition of an in-house developed transfer point seal to the product programme the company has now become a full-service supplier.

The Schulte Strathaus engineers examined similar solutions on the market before developing their new seal. "We wanted to know how they could be improved", noted Hanke. The result is a transfer point seal previously not known to the market. Its unique design is based on



André Hanke: "We can re-engineer complete conveying systems, including sheet metal work on the chutes." (Photo: Schulte Strathaus)

the use of two different kinds of polyurethane.

Hard polyurethane is used for guiding the material and softer polyurethane for the secondary dust seal. During conveying,

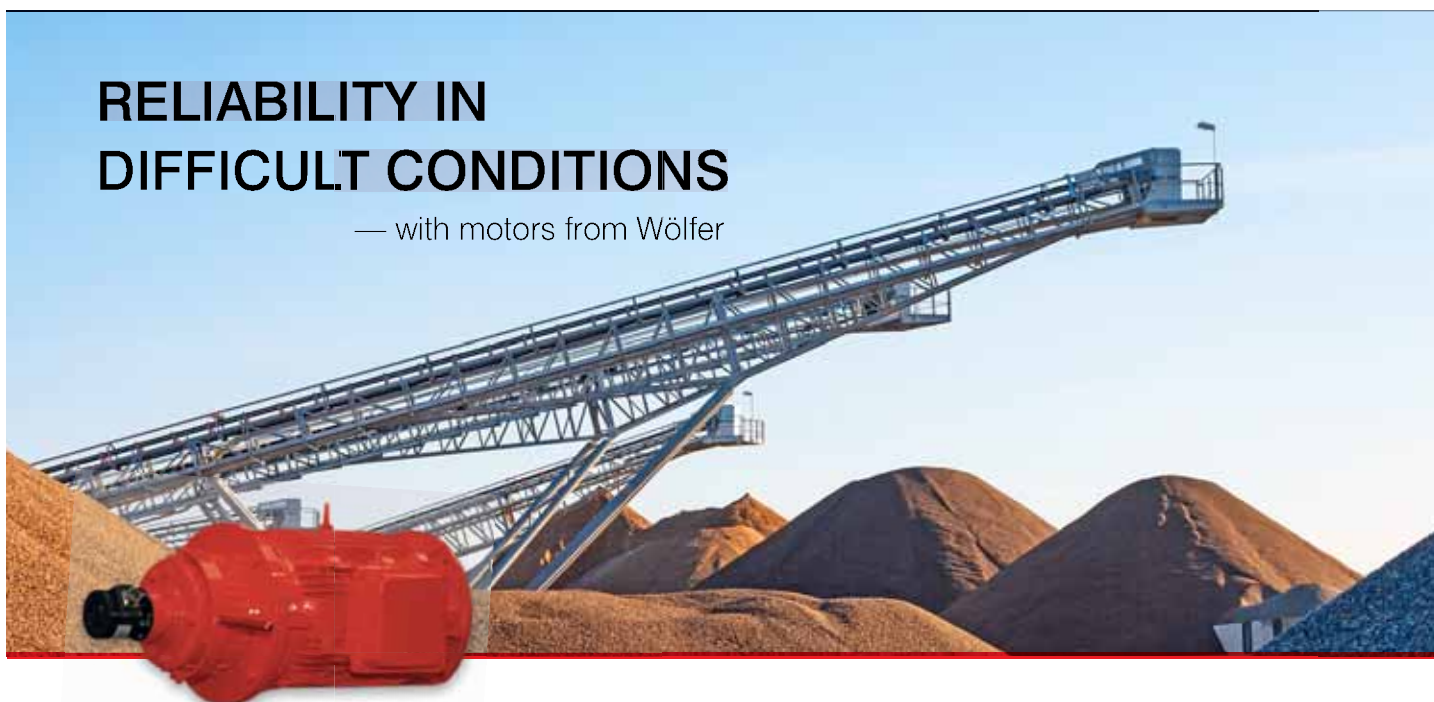
the dust seal applies light pressure on the belt to prevent dust emissions. The relative softness of the material employed results in low wear on the belt and thus increased belt lifespan.

Another feature is that the seal can be adjusted when necessary. "That not only guarantees a further increase in lifespan, but also ensures a continually high level of dust emission prevention throughout its working life," says Hanke. That in turn helps to increase efficiency and lower costs. Rubber would not have been a suitable material, according to Hanke, since rubber grinding against rubber would have produced too much friction and thus relatively rapid wear. The company also considered the use of polyurethane coated rubber impracticable: "As soon as the coating wore off, the seal would be useless," Hanke says.

There is more competition within the sector now with Schulte Strathaus joining the ranks of full-service suppliers. "We can re-engineer complete conveying systems, including sheet metal work on the chutes," added Hanke.

RELIABILITY IN DIFFICULT CONDITIONS

— with motors from Wölfer



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SIBRE focuses on ease of maintenance, safety and sensor optimization

SIBRE Siegerland Bremsen GmbH is a globally operating, medium-sized company which has been in business for over 50 years. From the outset, the company has engaged in the development and production of industrial brake systems and drive components. Its customers are consultants, OEMs and operators in heavy duty industries such as — but not limited to — ports, steel mills, mining and regenerative energies.

Right from the start, value was set on technical innovation, the most modern manufacturing technology and high customer use. Production procedures are continuously supervised by a quality management system certified to ISO 9001. The aim of the product development is an optimum combination of a top-quality product, the easiest use, and market-driven price both for plant engineers and plant operators.

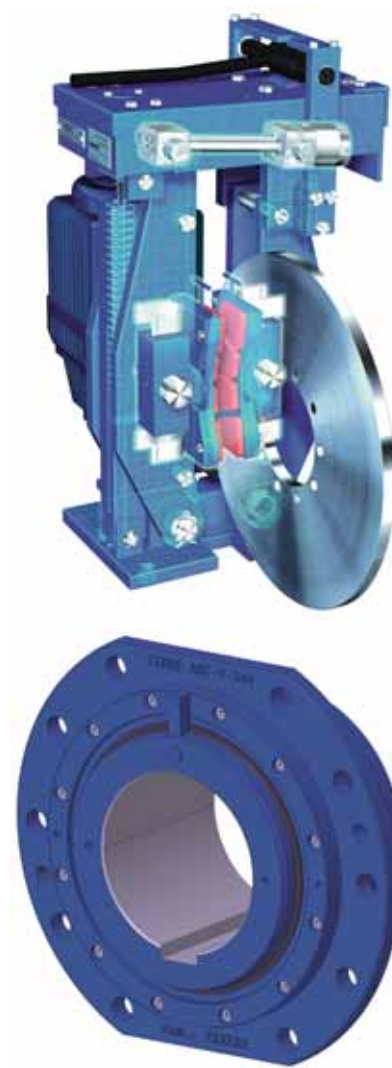
A team of highly qualified engineers, technicians and designers develop brakes and drive components, and these are adapted for use with increasingly complex and powerful drives. SIBRE customers benefit from not only decades of experience in brake production, but also from the most modern construction and manufacturing technologies. SIBRE works with modern, efficient construction 3D software for the design layout of the brakes and has its own high-quality test and measuring lab.

The company, as a system supplier, has a worldwide presence through its representatives, and also runs branches in China, India, Spain, Italy, Sweden, Serbia and the USA.

In addition to new product developments, in recent years SIBRE *inter alia* has attached great emphasis to the optimization not only of the mechanics, but also the sensor systems of the products.

The SIBRE IBC-control system for belt conveyors is ideal to ensure essential safety functions and control of brake cascades. For example, well-defined brake cascades can be installed at the transfer stations of independent belt conveyor systems to avoid piling of transported material during emergency stops and clamping. According to requirements, linear, progressive or degressive deceleration curves can be defined with the IBC-control system.

Soft braking in the braking operation prevents tension stress peaks in the conveyor belt. Identical deceleration curves and braking times can be achieved even under varying load conditions and



even with different brake systems in the plant.

IBC-control systems for electro-hydraulic drum and disc brakes consist of a programmable frequency inverter with function modules (software) and an input unit (pedal, internal or external parametrization interface, process control module with measuring sensor). A frequency change will be generated at the output of the frequency inverter. This frequency change is used to activate an electro-hydraulic thruster so that its hydraulic force can be varied. The resultant actuating force of the electro-hydraulic thruster is effective opposite the braking



force of the braking system, so that this relation forms the basis for the control of the braking operation.

IBC-control systems are qualified for subsequent installation and therefore are predestinated for modernization of machines and drive systems. They are inexpensive and provide a flexible use through a wide range of permitted input voltages. Obviously, all SIBRE products designed for open-cast mining conform to all dust-control regulations.

The topic of sensor optimization also covers the development of monitoring systems for brakes. The status monitoring system SMS for the SIBRE USB, TEXU and SHI brakes is using monitoring switches, contacts, temperature sensors and strain-gauge technology to continuously read the actual status of the brake. These constantly available status messages about the condition of the brake systems reduce the maintenance costs, optimize maintenance planning, increase process reliability and machine uptime and diminish the danger of unscheduled machine breakdown.

One of the above-mentioned new product developments, the drum coupling ABC-V optimally is in line with the distribution channel and the one-stop-supplier-strategy of SIBRE. The drum coupling is entirely produced in the German headquarters.

For the first time in the market in 2010, the ABC-V is with compatible fitting sizes especially designed for the transfer of medium and high torques in crane hoisting gear, conveyance, stackers, ship unloaders, container cranes as well as in heavy, rough smelting works. Torques of up to 1,025kNm and radial loads of up to 550kN can be transferred with a maximum coupling diameter of 1,025mm which provides a high overload safety.

High-quality coated forged steel guarantee durability, wear resistance and high material strength. Together with the arched drum roll (hardened rolling bearing steel) it is possible for the hub to oscillate relative to the housing. This allows for a compensation of angular displacement up to $\pm 1^\circ$ and a axial shifting from $\pm 4\text{mm}$ up to $\pm 10\text{mm}$.

SIBRE considers it essential to look at the life cycle costs: over the life span of drive components the maintenance can be higher than the initial purchasing costs. This is why SIBRE is passionate about designing and manufacturing lasting products that require lowest possible maintenance and that are easy to maintain.

Keeping conveyor belts clean with Applied Conveyor Technology

The ACT Group comprises three distinct companies: Applied Conveyor Technology Inc., Air Pollution Control (APC) Inc., and Dustco Inc.

The three companies specialize in different aspects of the bulk handling industry and venture into different avenues of environmental control. Formed (as a group) in 1998, the three companies sought to combine administrative, inventory, development and distribution roles into one central location to reduce operating costs and expenses.

Operating under the ACT Group umbrella, each company can specialize in its individual field while utilizing the resources of the other members and partners. Often contracts and applications require the disciplines of all three companies and specialties to offer a complete and viable solution.

This operating practice not only benefits the group but also offers the customer a cohesive and integral supplier for the complete contract where the different applications work seamlessly with each other. Applied Conveyor Technology Inc. is the 'big brother' of the group and provides the lynchpin around which The ACT Group operates. Formed in 1991, Applied Conveyor Technology supplies systems and components for the bulk handling industry. These include items as diverse as magnets and motor drives; level indicators and conveyor belting; pulleys and screw conveyors. Applied Conveyor Technology

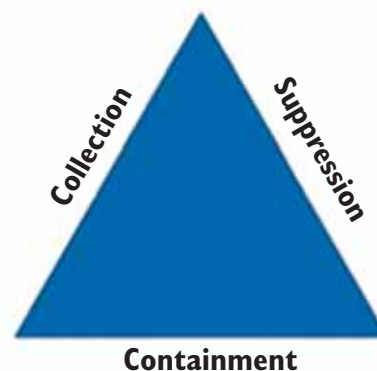
also provides the fabrication and construction mechanics for the rest of the group.

ACT offers a holistic approach to dust control by approaching each project with first determine what mechanical measures should be taken, containment. From those results, it is determined which dust control method would best suit the application, collection/extraction or suppression with water/chemical.

ACT DUST CONTROL DIVISION has two arms; one is Air Pollution Control (APC) Inc., specializing in dust collection/extraction and similar systems. Over 25 years of design and installation experience augment the company's wide services. It specializes in designing systems around clients' needs and requirements rather than limiting itself to stock brands. APC Inc.'s experience includes dust collection includes: pre-filter systems (cyclones); collection systems (both fabric and filter); vacuum systems; drum filters; and all types of service options for dust collection systems.

Dustco Inc. offers expertise in dust suppression using water and chemicals in all forms. It designs and manufactures equipment that produces droplets as small as 2 microns (a tenth of the diameter of a human hair) to spray systems that dampen the product as it moves through the process. It has added the use of chemicals to its repertoire, to allow a wider range of

Dust management is a combination of all three



treatments for differing applications. Dustco Inc. can supply a complete answer to all dust suppression needs and works closely with APC DIVISION to combine talents where applicable. Dustco Inc. also provides environmental control systems for a wide range of industries. High-pressure fog systems with micron-sized droplets have the ability to cool and humidify environments to offer a perfect storage, growing or living environment. Fog has the ability to cool the surrounding air by as much as 22°F in certain conditions; this effect can be used to cool employees, equipment and processes in a wide variety of applications.

The object of The ACT Group is to supply the customer with the right product at the best available price and to offer alongside an unparalleled pre- and after-sales service from its locations throughout California. It strives to adapt its services and products to fit in the clients schedule and work processes. Clients' needs, work schedules and practices always come first.

The group operates in not only Southern California but ships to all parts of the USA. Overseas clients receive material, support, and information just as easily as the home states; specific technical considerations are always adhered to and followed. The group's staff members have years of exporting experience behind them and can adapt to differing countries and hemispheres as easily as different states in the USA.

Applied Conveyor Technology Inc. supplies a wide range of accessories for the bulk conveyor markets. These include:

- ❖ conveyor belt cleaners (primary, secondary, and speciality cleaners);
- ❖ flow aids (flash air cannon, vibrators-electric/pneumatic/hydraulic);

Flash air cannon.



Isolation valve.



- ❖ vibration systems (Vib-Slide);
- ❖ transfer points (spillage saver kits; no contact skirting, no leak feed chutes)
- ❖ safety and other accessories;
- ❖ pulleys, idler, magnets, metal detection;
- ❖ screw conveyors, bucket elevators, drag chain conveyors, feeder;
- ❖ spectrum conveyor belting; and
- ❖ conveyor belt fasteners.

QUICK OVERVIEW OF THE ACT CONTAINMENT TIPS CONTAINMENT TIPS TO IMPROVE DUST CONTROL OF CONVEYORS

Dust control is critical in increasing production as well as reducing maintenance costs. Its importance ranges from improved productivity, due to less unscheduled downtime, to increased performance of equipment, reducing maintenance costs. More importantly is the long-term effect that fugitive dust and spillage has on the human element. Studies reflect significant savings in medical costs as well as worker's compensation costs when effective dust control measures are implemented.

When considering dust control methods, whether it is dust collection (use of air) or dust suppression (the use of water or chemicals), containment is the foundation to success of most applications. Without proper containment, neither dust collection nor dust suppression systems will be effective. However, it is important to note that containment is not as critical with the use of foams or chemical surfactants, though the trade off is increased future operating costs. Therefore, containment issues must be addressed when discussing dust control.

Containment of transfer points and head chutes of conveyors are the focus of this pamphlet. The following applied principals have proven success to all transfer points:

1. Proper belt support to prevent belt sag is accomplished with the use of:

- ❖ Troughed cradles, impact cradles and sealing cradles;
- ❖ No-leak sealing systems;
- ❖ Installation of said cradles with idlers (steel cans as specified by CEMA) at each end to minimize belt drag and reduce horsepower requirements. Standard impact idlers are suggested with minimum CEMA C specifications.

CEMA D and E preferred;

- ❖ As an alternative the use of idlers either standard or impact at 8-12" centres, although it may not eliminate all sag but they can be relatively effective. When using idlers as such use removable idlers to minimize maintenance when change out of idlers are required; and
- ❖ Belt supports that cover actual impact/load areas as well as a distance equal to three times the belt width from impact area to ensure proper sealing.

2. Proper chute design:

- ❖ Determine length, usually 4-5 times belt width, also design such that the side chutes are easily replaced. One method is to flange side chutes just above the area required for skirting;
- ❖ Chute height minimum of 18" to help reduce velocities (if room permits higher is usually better), the use of dust curtains can assist with air velocity reductions (if room permits). The curtains can be made of various materials such as nylon strips or old belting slit at half-inch increments. The purpose is to allow material to accumulate and then drop to the belt. The larger the slits the more likely build-up will occur due to less movement, where as narrower slits will create its own vibration (movement) to release the attached particulate back onto the belt. In addition, the use of dust curtains, as stated, reduces the velocity of the air, thus allows dust collector or dust suppression system to be more effective as well as minimizing the particulate size for the collector or suppression to contend with. The collector can be a centralized unit or a self-contained single pick-up point unit;
- ❖ Chute width to allow proper skirting system, usually 3-4" on each side. There are number of variations of skirting available, the two-piece Apron Seal™ is ACT's recommended style;
- ❖ Install tailgate 24-48" long, 18-24" in height to help prevent rear spillage and dusting, install with access door at top of unit to assist with clean-up for unexpected occurrences, also install deflection plate to prevent airborne product to reach back of tailgate. OR the revolutionary Omega Tail Seal which can be adapted to most tail sections;
- ❖ Minimize impact by use of deflector plates, rock boxes, etc. Reduce turbulence and thus minimize spillage and dusting by designing chutes that slow material speed down, place the material flow in the same direction as

the belt;

- ❖ Keep chutes in-line for proper loading, if not possible the use of deflectors, liners, baffles, shapers, screens, grizzly bars, horseshoe plates and training gates can assist with ensuring balanced loading pattern;
 - ❖ Use of wear liners to help prevent product from spilling and assist with material containment. Install liner to start as close as 3/16" above belt (at back of chute beginning of wear plate) and increase to as much as 3/4-1" above belt (at exit point). This is to prevent material from being lodged between belt and wear-liner.
- #### 3. Proper skirting:
- ❖ There is a variety of sealing systems available such as rubber, urethane and UHMW, all have advantages and disadvantages. It is important to evaluate based on customer's specific application.
 - ❖ Dual seal products are also recommended and are available in either rubber or urethane;



Belting.



Conveyor skirting.

- ❖ Use clamps, which are easy to install and to replace. Match clamp length with side chute length. Be cautious as to the durability for the specified application. Size of clamps should take tonnage and belt speed into consideration.

4. Proper head chute/tail pulley design:

- ❖ Design should be such as to allow for multiple belt cleaners, this pertains to

Multipurpose cleaner.



Primary cleaner.



Secondary cleaner.



Guidlers are effective and have great value.

- ❖ Installation of V-Plow or Diagonal Plow to protect tail pulley from any unexpected debris which may have fallen onto the underside of belt and could damage said tail pulley.
- ❖ When necessary consider using liner to increase wear life as well as flow.
- ❖ Chute angle should be greater than the angle of repose of said material
- ❖ Though not specifically related to sealing of transfer point, it is important to make sure the transition from the tail pulley to the transfer chute is set not to cause stress to belting. One rule is to allow transition to be two times the belt width.
- ❖ Design with access cover which is easily sealed.
- ❖ Seal all open holes, especially at points where cleaner's mainframe exit chutes. One easy and economical method is to cut rubber pieces to seal around the mainframe and attach with silicon. This procedure allows for easy removal and replacement when maintenance is required.

both installation and required future maintenance. If room does not allow for dual system, then place single belt cleaner such that it removes a majority of the carryback within the head chute, the secondary should be mounted in such a manner as the debris removed drops to an area accessible for easy clean up outside the head chute area. Also install a push down roller above contact point of cleaner to belt to promote maximum contact between belt and blade.

- ❖ It is important to remember the following:
 - primary cleaners are those placed from the trajectory of material to just before the 6:00 position
 - secondary are from 6:00 position to end of chute
 - tertiary cleaners beyond the chute.
- ❖ Design of chute back plate should be a minimum of 9" behind point of contact of secondary cleaner to allow for maximum flowability of product removed from top cover belt.
- ❖ Use of wing style tail pulley with straps limit vibration, however drum pulley is preferred. Vortex pulleys are an affordable combination of the two concepts.
- ❖ New-style trackers should be considered if belt misalignment is present. Though the tried-and-true

With respect to containment, The ACT Group is not limited to the above referenced recommendations. ACT's experienced sales and engineering design teams are available to offer a number of customized recommendations not covered in this pamphlet. The above is a guideline to follow and modify to clients' specific needs. By following the above suggestions, the use

of dust collection and/or dust suppression will be greatly enhanced. The result will be improved performance of dust control systems as well as improved housekeeping.

Each application must be reviewed and the equipment best suited should be installed prior to determining/installing/modifying the dust control system. With properly sealed transfer point and head chutes the cost of installing and operating the dust control system are significantly lowered, both from initial cost and operating cost.

As mentioned above, containment with the use of foams and/or surfactants is not as critical as with dust collection and dust suppression. Review and implementing the containment guideline will decrease the operating cost when utilizing a foam/surfactant system. The key to use of chemicals in many instances is how they are applied to one source and how they control dusting throughout the process. The ACT Group is proud to supply chemicals that are environmentally safe. It addresses the process portioning, stockpiles and roadways. The final result is always a cleaner, safer and cost-effective facility.

The ACT Group aims to make its customers' operations safer, cleaner and more productive, through superior customer service, high quality, and a commitment to excellence.



For Solutions, Contact us:

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For more information, please visit our website: WWW.GROUPACT.COM



Conveyor Components

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- Belt Cleaners
- Skirting & Sealing
- Alignment & Support



Dust Suppression

- Complete Systems
- Chemical/ Surfactant
- Nozzles & Filters
- Pumps & Motors



Wear Parts

- Impact Bars
- Wear Liners
- Crown Bars
- Screen Media

Conveyor belt system EMO now fully operational



Europees Massagoed Overslagbedrijf (EMO) B.V., a 100% subsidiary of HES International B.V., finalized an investment programme for the replacement of an essential part of its conveyor belt system this summer. Having replaced all three conveyor lines along the 1.5km-long unloading quay in 2016, EMO has now completed the renewal of the conveyor belt system on the west side of the

terminal. The new system comprises eight conveyor lines, which are used for dedicated and efficient storage and loading services towards EMO's stacker-reclaimers, barge loaders, train loaders and blending silos.

Thanks to EMO's experienced project team this challenging brownfield project has been implemented without any unforeseen business interruptions and within the

planned timeline and budget.

The project involves the total renewal and upgrading of the belt system, which has been functioning since EMO started its operations in 1973. By using state-of-the-art technologies and by designing out inefficiencies, a significant reduction in labour, maintenance and energy costs will be achieved.

This investment is in line with EMO's



long-term strategy to continue serving the European iron ore, thermal and coking coal market. Ensuring customer performance, safeguarding Health, Safety, Security and Environment standards as well as EMO terminal's asset integrity.

All conveyor belts are now fully operational and have already transported several millions of tonnes of dry bulk products. EMO can take full advantage of these new assets and it is confident that its customers will appreciate these improvements too.

ABOUT EMO

Europees Massagoed Overslagbedrijf (EMO) B.V., is the largest transshipment terminal for coal and iron ore in Western Europe and occupies a top position in the dry bulk market. Modern and multi-functional, the EMO terminal is strategically



located at the Maasvlakte in Rotterdam. The terminal has grown rapidly since 1973 and has an excellent track record in storage and transshipment. The quayside, with a



KEY FIGURES

3,000 tonnes (European) new steel
168 piles
18,000 idlers
102 pulleys
13,100 metres of rubber belt
9,000 wind plates
75,000 metres electrical cable

draught of 23 metres, makes it possible for the world's largest vessels to unload at EMO. State-of-the-art facilities unload seagoing ships quickly and efficiently. In addition to loading and unloading ships, railcars and barges, the EMO terminal offers added-value services such as screening, blending and washing coal. EMO has a total storage capacity of seven million tonnes and has ample access to the hinterland by means of rail links and inland waterways.

Low-maintenance and energy-efficient transport of powders and granulates



POETH ANNOUNCES THE AIRCONVEYOR FOR 40% HIGHER ENERGY EFFICIENCY AND 75% LESS MAINTENANCE WHEN TRANSPORTING POWDERS AND GRANULATES

Poeth has designed its new AirConveyor specifically for companies that want to transport powders, pellets and granulates cost-effectively and efficiently. This innovative system offers companies 75% lower maintenance costs after approximately three years' operating time and consumes 40% less energy. The air-supported conveying system from Poeth is

suitable for damage-free transportation of bulk goods over short or extremely long distances. The AirConveyor generates low noise emissions and is dust-tight. As a result, the new conveying system from Poeth also has a minimum impact on the environment.

POWERFUL AIR CUSHION SUPPORTS THE CONVEYOR BELT WITHOUT THE NEED FOR ROLLERS

Poeth has developed a new and efficient generation conveying systems where the conveyor belt floats on a cushion of air. The

AirConveyor features a perforated channel and compact, specially designed fans. By providing a constant supply of exactly the right quantity of air, Poeth has succeeded in creating a powerful air cushion directly under the conveyor belt in its new conveying system. This powerful air cushion makes it possible to raise the conveyor belt, along with the bulk goods it carries, and keep it airborne, based on the same principle as that used by a hovercraft. Only one conveyor roller — located in the drive, tensioning and belt return station — is needed to set the conveyor belt in motion.

Poeth's new AirConveyor eliminates 95% of all moving parts in comparison with traditional belt conveyor systems. As a result, the AirConveyor generates far less friction. This makes the air-supported conveying system 40% more energy-efficient and significantly reduces noise emissions (<80dbA). Fewer moving parts result in much less maintenance and negligible conveyor belt wear. Fewer rotating parts also provide less heat and less risk of exposures. The AirConveyor is suitable for extreme circumstances and difficult-to-reach places. This also makes it extremely reliable and cost-efficient.



**HOMOGENEOUS, DAMAGE-FREE
CONVEYING OVER LONG DISTANCES**

The new belt conveyor from Poeth is suitable for transporting raw materials in the feed, food, chemical and bulk industries. The AirConveyor is used to transport a wide variety of products such as salt, sugar, cereals, seeds, animal feed, biomass, coal, ore, sand and gravel.

The advantage of belt conveyors is that they transport products without agitating them. Consequently, the new AirConveyor is ideally suited for conveying fragile, explosive and sticky raw materials without risking separation. The new AirConveyor is capable of high-capacity transportation (3m³/hour — 2,000m³/hour), both horizontally and vertically. Poeth offers its AirConveyor as an enclosed, dust-tight system for both indoor and outdoor application. The AirConveyor is also available according ATEX and Food Grade guidelines (FDA, EC 1935/2004 and 3.1B material certificates).

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The application of ST-HHE steel cord belts in conveyor systems

The belt is a key component of belt conveyors, write Jiang Xueqing, Smartec (China) Mining Engineering Co., Ltd and Li Mingxia, ST-HHE belt vice-CTO, Qingdao Huaxia Rubber Industry Co., Ltd.

The length of a conveyor is limited due to its weight and limited strength. Thickness is also a problem when the size of a conveyor is particularly large.

The ST-HHE belt was developed to overcome the problems encountered with conventional ST belt conveyors. The ST-HHE has a similar structure to a conventional ST belt. However, the wire ropes in the ST-HHE belt are much thinner, and closer together. The rubber cover of the belt is specially designed and its chemical composition is optimized. The belt itself is therefore much thinner and lighter, so the support structures and conveyor components can be designed to be lighter or smaller.





Smartec (China) Mining Engineering Co. Ltd. has used the ST-HHE belt in the design of several conveyor systems supplied for use in coal mines, tunnelling projects, iron and steel plants, and so on.

Following strict technical inspections and tests carried out to national/international standards, a series of safety certificate of Approval for Mining Products (MT668, is similar to DIN EN14973) has been awarded by China Coal Mining Authority (MA is similar to DMT /

TEST DATA OF THE ST-HHE 3500

Test Item	Requirement	Result	Conclusion
Longitudinal Tensile Strength, KN/m	≥3,550	3,704	pass
Adhesive strength with cover rubber, KN/m	≥10/10	18.5/17	pass
Elongation of cover rubber broken, %	≥15	16.2	pass
Abrasion loss, mm ³	≤120	109	pass
Dynamic fatigue property of rope bonding, after 104 recycles	w/o pull out	w/o pull out	pass
Average flame burn period w/cover rubber, s	≤3	0.86	pass

Structure of HHE belt Vs ST belt

	ST3500	ST-HHE3500
Wire rope arrangement		
	THK 24.6mm, weight 42.8kg/m	THK 14.9mm, weight 26.9kg/m
Wire rope structure		
	133 wires (8.6mm), zinc plating	190 wires (4.9mm); copper plating

ST-HHE steel cord belt installed in port for use moving coal or ores.



ST-HHE steel cord belt replaced EP fabric belt at this power station plant (and picture, below).



Germany. The ST-HHE belt series has also gained great recognition and approval from clients after many years of smooth-running operations at the projects illustrated.

STRUCTURE OF THE ST-HHE BELT

The advantage of the ST-HHE belt is described in the conveyor system calculation. A comparison with

conventional ST belt is analysed with technical data, theoretically and practically, and is shown on p56.

CALCULATION AND RUN OF A TUNNELLING CONVEYOR

In past studies and investigations, carried out according to DIN22101 standards:

❖ Power needed: $P_w = F_w *$

❖ Operation resistance: $F_w = F_H + F_N + F_{St} + F_S = F_H / (0.5 - 0.85)$

❖ Main resistance: $F_H = (l_i * f * g * (mR_i + (mG + mLi) * \cos i))$

Where, Indentation resistance contributes about 60% to friction coefficient f. In cases where idler and capacity are decided, belt mass changes results in resistance changes.

Basis on Jonkers Indentation Model,



indentation resistance $FE = C * \tan(\) / E$ (1/3), indentation resistance is direct proportional to $\tan(\)$. The test was carried out by Dynamic Mechanics Analyzer (DMA) in factory laboratory. It is concluded at least 10% reduction of friction coefficient.

CONVEYOR DATA OF A CHINESE WATER PROJECT

- ❖ capacity: 300–500tph;
- ❖ bulk density: 1.7t/m³;
- ❖ belt width: 650mm;
- ❖ belt speed: 2.8m/s;
- ❖ horizontal length: 15km;
- ❖ drive starting method: frequency converter drive; and
- ❖ drive and pulley arrangement.

Actual installed power is 2x315kw. ST-HHE 1600 belt is applied and installed to this conveyor. Running data shows the conveyor has been working well for the past two years. A significant amount of power (more than 2 million kw.h) is saved compared with the original design.

WEIGHT

Two factors significantly impact the main operational resistance reduction: one is mass of belt; one is indentation resistance.

In the same working conditions and same capacity requirements, the ST-HHE belt can be selected one class lower than normal, with a better safety factor. This is especially applicable to long conveyors.

The key components of a conveyor — such as pulley, drive units, take-up device,

CALCULATION RESULT				
Conveyor component	Unit	ST2000	ST-HHE1600	Comments
Basic friction coefficient		0.022	0.020	Indentation considered
Calculated power all segments loaded	kW	766	530	-31%
Calculated power all segments empty	kW	466	258	-45%
Number of drives		2	2	
Motor Rating	kW	450	315	-30%
Installed Power	kW	900	630	-30%
Calculated gear box ratio		28	22.4	-20%
Take-up force	kN	63	44	-30%
Take-up travel	m	67	56	-16%
Drive pulley diameter	mm	1000	800	-37%
Non dr. pulleys diameter	mm	800/630/500	500/400	-20%
Max. belt tension Tl loaded (steady/start/stop)	kN	319/345/94	219/240/59	-31%
Thickness of belt	mm	20	10.5	-47.5%
Weight of belt	Kg/m	30.2	16.8	-44.5%
Belt safety factor		4.07	4.71	ST belt is not enough

support structures, etc. — can be designed smaller or lighter but stronger because of lower belt tensions.

This is why the initial investment is lower. The lifetime of idlers is increased by 20–30%. In some cases, it would be

possible to select a smaller-sized idler.

The operational costs of the conveyor are lower because the lifetime of idlers, and pulley bearings is longer. Lower energy consumption also contributes to reduced operational costs.



Minimum curving radius 300m with ST-HHE1250.

From ship to shore, from shore to ship...



...for sure.

Nectar can say “for sure” with confidence.

We've been supplying market leading bulk handling solutions for over 40 years and encountered and overcome many difficult situations, scenarios and challenges,

Since inventing the first mobile bagging system in the 1970s we have become world leaders in all aspects of bulk handling. Nectar have worked hard to develop important strategic relationships and specialist knowledge of port infrastructures ensuring that the solution we provide delivers your product on time, intact and cost effectively anywhere around the world.

Whether it's the simple task of transporting your product from A to B overland or consulting on the design, build and management of a new port we will have all the answers...**for sure.**



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RopeCon®

The Innovation in Bulk Material Handling

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

www.doppelmayr-mts.com



 ... your success story.

 Our know-how ...

RopeCon® – safe transport even through rugged and steep terrain

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

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

This bulk material and unit load handling conveyor combines the benefits of well-proven ropeway technology with those of a conventional conveyor belt (hence the name RopeCon®). It offers conveying capacities of up to 20,000 tonnes per hour and conveying lengths of 20km in one flight. The system operates off the ground, thus minimizing space requirements and easily crossing buildings, roads, rivers, valleys or other obstacles. The perfect adaptation of the conveyor to the natural terrain allows for a straight conveying line with only a minimum of line structures and tower distances of up to 1,500m.

The controls of the RopeCon® system



can be integrated into the main controls of a logistics chain and the system works fully automatically. Furthermore, as the wheel sets are bolted to the belt, practically all moving items constantly return through the stations and can be easily maintained there. Thus, there is no need to go out into windy, cold or rainy weather to perform maintenance tasks. Works can be carried out in a safe workshop environment. In

case the line has to be inspected, the system offers an inspection trolley, which travels along the top strand of track ropes. This system can be used to reach every point of the line easily and safely.

The implementation of the installation requires only a very narrow line corridor, even when installed in difficult terrain or in an area with already existing infrastructure. It can cross roads or buildings and does not interfere with truck traffic. Furthermore, used as an alternative to truck traffic, it can improve safety, especially where roads are narrow and winding and road conditions are often icy.

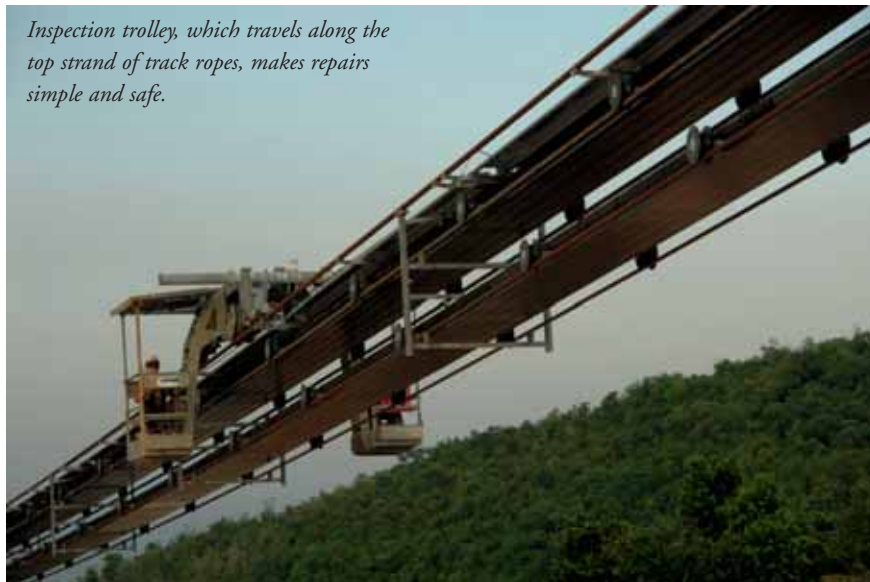
When applied as an alternative to truck traffic the use of this conveyor also makes it possible to keep CO₂ and fine dust emissions to a minimum. A very low noise emission of

only 55dba at a distance of 1m would further benefit the health of people living close to the conveying route.

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

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

Inspection trolley, which travels along the top strand of track ropes, makes repairs simple and safe.





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ORTS GmbH





Poetry in motion?

mobile harbour equipment for the bulk industry



Fuchs® material handler delivered to the Port of Moerdijk

48 TONNES OF FUCHS® HANDLING POWER DELIVERED TO BUIJS GROOT-AMMERS BY VAN DER SPEK VIANEN

Fuchs Benelux distributor Van der Spek has delivered a new Fuchs® MHL360F handler

to Buijs Groot-Ammer. The new 48-tonne handling machine was immediately put in to work at the port of Moerdijk where it unloaded a small coaster into a factory's hopper.

“These are exciting times for the Fuchs business,” comments Dominik Vierkotten, Fuchs Managing Director. “We are significantly strengthening the Fuchs team, increasing local support by growing our

distribution network, broadening and updating our purpose-built handler line for the market, and customizing our equipment to meet specific application needs for our customers. It's a good time to be a Fuchs material handler customer."

Family owned company Buijs has many years of experience in handling various materials in Dutch harbours. With a fleet of 15 handling machines, it is one of the biggest handling companies which transport the machines by trailer to the job sites. The positive experience with Fuchs machines and dealer Van der Spek made the decision to deal again with Fuchs a simple one.



AWARD, a world-renowned design prize. It won over the 58 member jury, made up of independent experts from all over the world, with its sliding door, skylight and downward-facing windshield. The competition was intense: over 5,500 entries were submitted from 59 countries in hopes of receiving the seal of quality.

The sleek new cab design incorporates more glass to improve visibility, new joystick steering control for improved manoeuvrability and a revised interior for

With a reach of 18 metres (middle of the turntable/end stick) the machine can handle mid-size coasters without any problems. The cranked boom even makes it possible to still have easy access when the ship is above the dockside. With the grapple the reach is 19.5 metres.

The MHL360F handler is delivered with a durable and very efficient (read low diesel consumption) Deutz six-cylinder diesel engine with 190kW which drives the three Bosch-Rexroth hydraulic pumps. Two 280 litre/min pumps drive the boom and grapple and one separate 140 litre/min pump drives the swing. Through this set-up the machine is faster and smoother to operate than the previous series.

The Fuchs MHL360F was delivered with the award winning Fox Cab. The new Fuchs Fox Cab, which will be introduced to all

models in the coming months, has been seen by many at Bauma, ISRI and IFAT. The new cab was awarded the IF DESIGN

more space and greater operator comfort. The cab has been specially designed for Fuchs' material handling machines.



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TERMINAL VLISSINGEN: 300.000 M2 PAVED TERRAIN

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EXPANSION OF COVERED STORAGE CAPACITY BY THE END OF 2017

DRAUGHT: 16,50 M SW

GMP CERTIFIED



SEA invest orders three Konecranes Gottwald mobile harbour cranes for Belgium and France

In April 2017, Konecranes won another order for diesel-electric Konecranes Gottwald mobile harbour cranes from its long-term customer SEA-invest. SEA-invest will add three Model 6 machines to its existing fleet of 36 cranes. Thanks to Konecranes' continuous production concept, all three cranes will be put into operation this year.

The order includes two Model 6 four-rope grab cranes for bulk handling (maximum capacity 100 tonnes, maximum outreach 51m) for SEA-invest's terminals in Ghent (Belgium) and Rouen (France) as well as one Model 6 two-rope crane (125 tonnes, 51m) for Antwerp (Belgium).

With the Rouen and Ghent cranes, SEA-invest intends to further strengthen its position in the global bulk handling market. The Antwerp crane will help the customer to accelerate its growing container handling activities. Says Philippe Van de Vyvere, Managing Director of SEA-invest: "Together with our dedicated terminals in France, our recent acquisition of the Independent Maritime Terminal in Antwerp will form the backbone of our growing container and reefer handling business. As we operate Konecranes Gottwald mobile harbour cranes in many of our 25 European and African locations, it is simply logical that we now opt for the same technology with regard to this relatively recent container activity and as a sustainable extension of our bulk activities in Belgium and France."

Giuseppe Di Lisa, Sales & Marketing Director, Mobile Harbor Cranes, Konecranes, is pleased that many terminal operators around the globe are impressed by the qualities of Konecranes



Gottwald mobile harbour cranes: "Worldwide, our cranes are in high demand. We are proud that our technology has convinced SEA-invest once again, one of our most loyal customers."

ABOUT KONECRANES

Konecranes is a world-renowned group of Lifting Businesses™, serving a broad

range of customers, including manufacturing and process industries, shipyards, ports and terminals. Konecranes provides productivity enhancing lifting solutions as well as services for lifting equipment of all makes. In 2016, group (comparable combined company) sales totalled €3,278 million. The group has 17,000 employees at 600 locations in 50 countries.

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Crawler material handler powerfully shovels sand: SENNEBOGEN 850 E at Kuypers

For over 90 years, Kuypers, the family-owned company from Kessel in the Netherlands, has specialized in the transport and handling of materials. Since the end of 2016 sand, in particular, is delivered by ship via the Maas river and unloaded with the new SENNEBOGEN 850 crawler excavator directly from the quay.

The work area of Ruud Thijssen, the driver, is at almost 6m. He overlooks the Maas river and can intuitively operate his red SENNEBOGEN material handler. Finally the working weight of almost 80-tonne, 19m-long piece of equipment are moved safely and precisely and the SENNEBOGEN 850 with its broad gauge



With the SENNEBOGEN 850 E crawler material handler incoming ships are unloaded at Kuypers from Kessel in the Netherlands.



undercarriage is still directly at the quay wall. However this is not a problem — on a daily basis one grab load after the other lands safely in the hopper, from which the sand is conveyed straight away. Up to 2.75m³ of sand per cycle is removed from the incoming ships and is later distributed by lorry to construction sites in the area. As a family-owned company, Kuypers Kessel Beheer B.V., looks back on a company history of over 90 years in material handling. With the new SENNEBOGEN 850 from the E series, not only is the most modern technology used for unloading, the operator also saves money with every lift thanks to Green Hybrid energy recovery and efficient Green Efficiency engine technology according to a 4-tier standard.

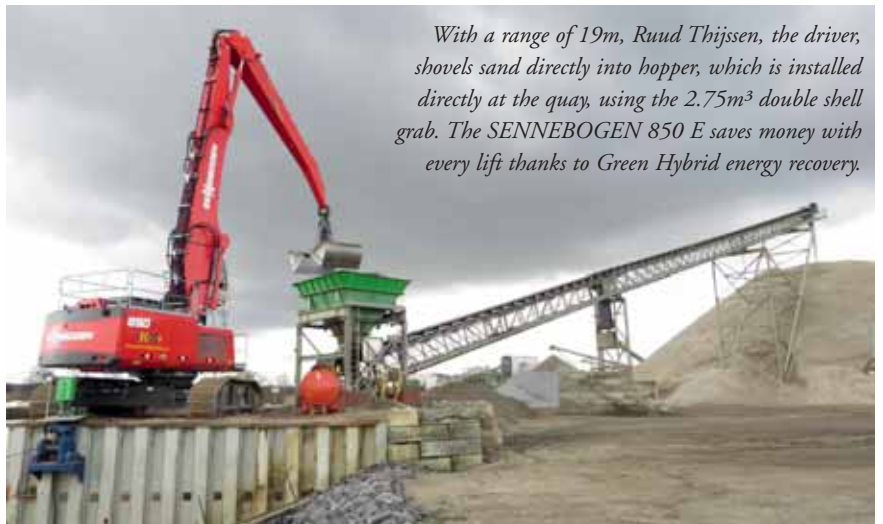
SAVE ENERGY AND COSTS WITH EVERY LIFT

With the Green Hybrid energy recovery system, which is used as standard in the large SENNEBOGEN Green Line material

handlers, a saving of up to 30% can easily be made with regards to operating costs. Fitted with a 224kW diesel engine and approximately 65kW achieved by the system, the machine has an overall system output close to 290kW and thus huge savings are made. The operating principle

of the recovery is easy and safe — similar to a spring which compresses and decompresses. When lowering the main boom, a third hydraulic cylinder recovers the kinetic energy. Following temporary storage in compressed gas storage tanks in the rear, this energy is available once more for the next lift.

Due to the exposed location directly at the quay, decisive criteria for those who are responsible at Kuypers were above all a comfortable reach depth of up to 7m to be able to unload incoming ships across the entire ship's width and also a reach height of approximately 20m for the hopper feed. Thanks to the broad gauge undercarriage the machine is not only stable but can also be operated at a variable rate along the quay. An additional outrigger is not required. Last but not least, the 850 E comes with a 2.70m elevating Maxcab comfort cab as standard. From this position, Thijssen, the driver, can not only look at the picturesque landscape but he also has the best view of his work area at the same time.



With a range of 19m, Ruud Thijssen, the driver, shovels sand directly into hopper, which is installed directly at the quay, using the 2.75m³ double shell grab. The SENNEBOGEN 850 E saves money with every lift thanks to Green Hybrid energy recovery.

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with balance principle and electric drive

Choose your undercarriage

Stationary, crawler, gantry, rail



8400E

Handysize

Supramax

Panamax



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130-300 t

Material Handling
20-160 t

Duty Cycle Crane
13,5-300 t

Crawler Crane
50-300 t

Telescopic Crane
16-120 t

Mobile Harbour Crane
300 t



Alfred Endl



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SENNEBOGEN

Bulk kings in the Middle East from Liebherr Maritime

- ❖ Saqr Port Authority ordered the first two LHM 800 in bulk version
- ❖ the biggest bulk MHCs can service vessel up to Capesize class
- ❖ the new Liebherr equipment will strengthen Saqr Ports top position in the Middle East bulk market

Liebherr Maritime recently signed a deal with Saqr Port Authority for two LHM 800 Liebherr mobile harbour cranes. These two cranes are the first machines in bulk handling configuration ever delivered by Liebherr.

Saqr Port Authority is about to establish new berths in order to further strengthen their position in the in the Middle East bulk market.

Saqr Port Authority recently signed a contract for two new units LHM 800 in bulk handling configuration. These two machines will be the biggest mobile harbour cranes for bulk operation in the Middle East.

Saqr Port is located at the foot of the Hajar Mountains in the north of the United

Arab +Emirates. The port mainly handles limestones and aggregates, which serves the majority of the construction projects within the Middle East and is central to its economic success.

Liebherr sold the first mobile harbour crane to Saqr Port more than 25 years ago. The partnership between both companies has grown successfully since then. Saqr Port operates eight Liebherr mobile harbour cranes of various types. Now it has opted for the biggest type available in Liebherr's extensive MHC product range – the LHM 800.

BIGGEST BULK MHC EQUIPPED WITH EFFICIENT TECHNOLOGY

The LHM 800 in bulk handling configuration comes with a 54-metre boom and a maximum lifting capacity of up to 144 tonnes. The powerful hydrostatic transmission and advanced Liebherr electronics ensure short, productive working cycles during bulk handling. Both machines for Saqr Port are equipped with Liebherr's unique Pactronic® system. This hydraulic

hybrid drive system achieves increased handling performance with reduced fuel consumption.

By adding an accumulator as a secondary energy source instead of a bigger or additional prime mover, Pactronic® regenerates the reverse power while lowering the load. The stored energy is transferred back to the system when the crane requires peak power during hoisting. In terms of turnover capacity, that means an increase of up to 30% compared to a conventional machine with an equal power rating of the primary energy source. With Pactronic®, the LHM 800 is able to achieve a turnover of up to 2,300 tonnes per hour.

STRONG COMMITMENT FOR THE FUTURE

Saqr Port made a number of forward-looking investments in the past. Besides the more than ten Liebherr mobile harbour cranes, it has also built up a Liebherr crane operator training centre to further increase the productivity of its staff. The forward-looking combination of advanced simulator-based training and high-speed machines has significantly improve the port's production figures.

Saqr Port committed itself to a strategy of continually investing in the quality and modernization of its port facilities. This includes the creation of additional deep-water berths, capable of efficiently handling Capesize vessels. The two new bulk giants LHM 800 will operate at these new berths and consequently reinforce Saqr Ports top position in the Middle East bulk market even more. Both cranes will start operation spring 2018.

LIEBHERR — IMPROVING EFFICIENCY

Both cranes will be delivered fully assembled directly from Liebherr's maritime headquarters in Rostock/Germany to Saqr Port at the beginning of 2018. The Saqr Port representatives are already looking forward to welcoming the two new units at their new berth. "These new mobile harbour cranes will helps us to improve our bulk handling efficiency even more. Thanks to its high lifting capacities at a wide outreach, we are able to expand our service portfolio up to Capesize class vessels. This is very important for the future development of our port. We have been operating Liebherr mobile harbour cranes for many years and are very satisfied with the overall performance and the reliability of the machines," says Capt. Cliff Brand – Group General Manager RAK Ports.



Two new Liebherr LHM 800 will strengthen Saqr Ports top position in the Middle East bulk market.

Experience the progress.



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LIEBHERR

Buttimer Engineering & DOCKSOLID: mobile hoppers for the bulk industry

Buttimer Engineering has been designing and manufacturing mobile handling systems to handle all types of dry bulk materials since it was established in 1978 by Edward Buttimer. With humble beginnings in Clonmel, Tipperary, Ireland, Buttimer Engineering has become a multi-national company with offices in Ireland, Birmingham in the UK and, since 2005, in Warsaw Poland. Buttimer Engineering has grown into an international mechanical engineering company and serves an array of industries with its high quality bulk handling equipment. Although Buttimer has grown to become a highly respected mechanical engineering contractor in the bulk handling industry, it remains a family owned company with Edward Buttimer's son, Fergal Buttimer, becoming Managing Director in 2012.

Buttimer Engineering prides itself on designing bespoke handling equipment to a very high standard. With customers from the Middle East, Asia, and South America as well as closer to home in Europe, 80% of Buttimer Engineering's work is repeat business.

Buttimer Engineering owns 'DOCKSOLID' which is well known within the industry for providing mobile bulk hoppers including ECO environmental hoppers. The hoppers are designed in house with DOCKSOLID engineers meeting all client specifications and restrictions as well as ensuring safety as the top priority. When manufacturing and fabrication is completed, each unit is fully assembled and tested before shipping to the client. An installation and commissioning team is mobilized to install and commission each hopper or conveyor to ensure client satisfaction.

The hoppers from the DOCKSOLID range are customized unloading solutions for dry bulk products. The hoppers are used to quickly and cleanly load trucks, rail wagons or conveyors from a crane grab. They are customized to meet the performance and commercial requirements



of clients, with each unit is tailored to the product and environment in which it will be used. DOCKSOLID hoppers are used to handle a very diverse range of dry bulk goods ranging from grains, minerals, fertilizers, and coal, to biomass, foodstuffs, and powders.

They are built for reliability and longevity, with a structure and frame engineered specifically for the static and dynamic loads exerted by moving bulk. DOCKSOLID

units are also fitted with a patented suspension system that equalizes forces evenly across the hopper's frame and the quay wall; this system ensures long-lasting structural integrity and safe, reliable bulk loading.

All the hoppers are specifically designed to prevent torsion and stress in the structure even on uneven terrain. The range extends from the simple, reliable Standard hopper, to units with sophisticated environmental controls, self-driving mobile capability, or bespoke discharge options. The hoppers can be wheel-mounted, rail-mounted, or static. Units can be designed to handle any amount from a small throughput up to several thousand tonnes per hour, depending on the loading-grab size, height restrictions imposed by the crane, and the density of the product. Each hopper in the DOCKSOLID range is built to meet the client's requirements, and DOCKSOLID strives to meet the functionality required and offer an unloading solution tailored to each application. DOCKSOLID equipment is engineered to thrive in clients' facilities, and almost never requires specialized civil works for installation and operation.

Buttimer Engineering also

specializes in bespoke handling equipment such as mobile and static conveyors, ship unloading and loading conveyors and equipment, rail mounted handling equipment as required by the customer. The company develops relationships with customers early, and can design its equipment to handle many types of dry bulk materials from iron ore, fertilizer, biomass to cereals and pharmaceutical products.

At Buttimer Engineering, the focus is on customer satisfaction. Alick MacAngus, Buttimer Engineering's UK Manager, states: "we look after our customers from start to finish and then some. By assisting our customers and providing excellent products and services to not only meet but exceed their expectations, we find that customers continue to use Buttimer Engineering in their next projects. A customer's recommendation is the best marketing available".

Quality and reliability are key. Buttimer Engineering continues to be involved through the lifetime of the equipment to ensure that the equipment is always available for use. "We know that reliability is important with our dry bulk handling systems. Maintenance and asset management is vital for our customers. Without that, production stops. We like to think that our cradle-to-grave customer support not only helps our customers realize their investment, but often allows them to exceed their production targets."

Buttimer Engineering has been involved with some of Europe's major port expansion and dry bulk Handling Projects over recent years. It installed and commissioned the mechanical handling equipment for Peel Ports Biomass Import Facility in Liverpool in 2016. The Biomass Handling Facility allows biomass shipments to be unloaded directly from the cargo vessels, and loaded into storage silos on the quay or directly to the freight train which then delivers the biomass pellets to the end clients. Buttimer worked closely with the civil contractors to ensure that the project was delivered and commissioned on time and within budget.

Buttimer has also recently carried out installation of biomass drying equipment for many clients where the wood chip is dried using heat from biomass power stations to ensure that the solid fuel is suitably dried before being delivered to the boilers.





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Systems for High Mobility and to
accommodate uneven quay walls.

DOCKSOLID State-of-the-art Dust Suppression
Systems.

DOCKSOLID Built for Reliability and Longevity:
Structures Designed for Dynamic and
Static Loads.

SpanSet high quality straps and slings improve safety in mobile equipment

FOR MORE THAN 50 YEARS, PEOPLE HAVE BEEN TRUSTING SPANSET WITH THEIR LIVES

It was not so long ago that the lives of thousands of people literally hung by a thread day after day – until Volvo began installing safety belts in its cars. The car safety belt was a great success, and soon other manufacturers began to install it. Thanks to the great demand, Erik Ehnimb, co-owner of Klippan, was able to found the SpanSet company in Malmö in 1966 along with other subsidiaries in Germany, Italy, France and England. Later, companies in Asia, America and Australia were added, thus forming a global distribution network.

The straps produced by SpanSet were quickly and enthusiastically put to use in many other areas in which chains and wire ropes had previously been used, for example for the transport of paper rolls. The customers appreciated the enormous load-bearing capacity of the new lashing and lifting slings. This innovation manufactured from a hardwearing fabric ribbon, which marked the birth of the company SpanSet,



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has revolutionized safety technology. According to the motto 'lighter, stronger, more flexible', the range of products was quickly expanded and the quality continuously improved.

SpanSet has pursued this principle with consistency and passion, which has made it an innovation leader — in some fields even the market leader in many areas of industry. When developing new products, SpanSet always strives to remain focused on the demands of its customers and users, with which it works closely with at all times.

The best example of this is Safeline, a fixed-line roof fall arrest system made from rustproof steel that is used as a horizontal fall arrest system and is manufactured in line with customer requirements for the specific application. SpanSet even finds highly specialized solutions for very complex applications, such as special products for use in the wind power industry. In doing so, it benefits greatly from its international orientation. This is especially true within the borders of the European Union, where its customers benefit from the close cooperation of the SpanSet group. With a close eye on EN

standards, SpanSet knows what users in Europe need and what demands the legislation of the various countries places on those using personal protective equipment.

SPANSET FOR INDONESIA

SpanSet is recognized globally as offering quality and reliability. From sub-zero temperatures in Europe to the blistering heat of the mining environment in Australia. SpanSet products continue to perform as intended, giving the end user peace of mind and ensuring the highest levels of Safety. SpanSet product with over a 1,000 NATO codified, defence forces around the world continue to specify the brand.

SpanSet Indonesia has been established since 1997 as a domestic company, and in 2013 has changed to foreign company. SpanSet Indonesia's premises in Bekasi have also been awarded with a Certificate of Testing from Dinas Penelitian dan Pengembangan TNI AD.

Recently, in 2017, SpanSet Indonesia has been certified as LEEA (Lifting Equipment Engineering Association) Full Member after having been audited in accordance with the Association's technical audit procedure

specified in document reference LEEA 042.

SpanSet develops and manufactures product for fall protection lifting and load control systems from high-strength synthetic fibres. As the maker of a wide range of lifting belts, round sling, lashing belts and personal safety equipment to protect against falling (PSEAF) and offers in addition associated services such as competent consulting, training, test and repair services and a special made-to-order service.

That is, its emphasis is on listening rather than talking, then drawing on extensive experience and global resources to find the most global resources to find the most efficient solution. After all, they have contributed to safer and easier working conditions around the world — and thus to fewer accidents and lower operating costs.

The SpanSet brand stands for not only for meeting international safety standards, but for raising them. This is exactly what the company stands for with its products, services and consultancy: for more security than is demanded today — namely, as much as is possible tomorrow. That is the company's goal.

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LOADER
up to 2000 t/h

SIMPORTER
up to 1500 t/h



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between customer expertise and VIGAN know-how*



Cereal cargoes: thinking outside the box

grain handling technologies



Telestack's TB52 radial telescopic conveyor loading grain onto a coaster vessel from a fixed plinth for Trans-Oil based in Moldova.

Louise Dodds-Ely

Mobile grain handling systems from Telestack

When handling grains within ports and terminals, application knowledge and understanding gained through experience is absolutely paramount. Telestack has been designing and manufacturing equipment for the grain industry for over 30 years and has developed a portfolio of cambered and telescopic boom shiploaders, ship-unloaders, hopper feeders and bulk reception feeders from across the globe to complete its extensive Export range. The Telestack range facilitates the elimination of

double handling of the material and transfers material in a safe and efficient manner whilst ensuring mobility and flexibility throughout all operations.

One of the principal pieces of equipment used by the grain industry is the radial telescopic shiploader, used to eliminate double handling. With flexibility, mobility, maximum production rates and product integrity at the core of all designs, the Telestack TB Export range of equipment is one of the leading brands in

the ports and inland terminals industry. The radial and telescopic features of the radial telescopic unit ensures enhanced trimming of the vessel (up to two hatches) from a single feed-in point reducing hatch change times and production downtime. With the ability to load up to Panamax vessels with ease, the Telestack shiploaders also offers a complete range of options to suit the grain application.

Telestack offers a range of options to tackle dust generation, including dust



TB58 loading grain from a Titan W388-4 onto a barge in Ukraine incorporating a range of features for the grain application including dust containment enclosure and galvanized steel enclosure on the hopper incline section of the Titan unit and galvanized dust covers and telescopic chute on the TB58 and a fully enclosed transfer point between the two units

containment and extraction, telescopic chutes (for example telescopic cascade chute, telescopic freefall chute, deflector chute, 360° radial trimmer, telescopic steel chute) dust covers and side wind plates. Spillage is managed by incorporating a range of fully sealed feed-in and transfer points, under trays and primary skirting and secondary skirting. The conveyor can also be fully covered from the feed in point to the discharge point (including transfer points) ensuring adverse weather does not affect the quality of the products and the dual power (all electric) option is available to allow the equipment to be powered by an on board gen-set or by a jetty power supply.

The TB Export range of radial telescopic shiploaders are available in a range of mobility options to suit the varying quayside restrictions and site conditions including track mounted, wheel mounted, rail mounted or fixed radial telescopic or a combination to suit the



Rail-mounted Teleslack TB52 loading grain onto a Handymax vessel from a tripper conveyor in Ukraine.

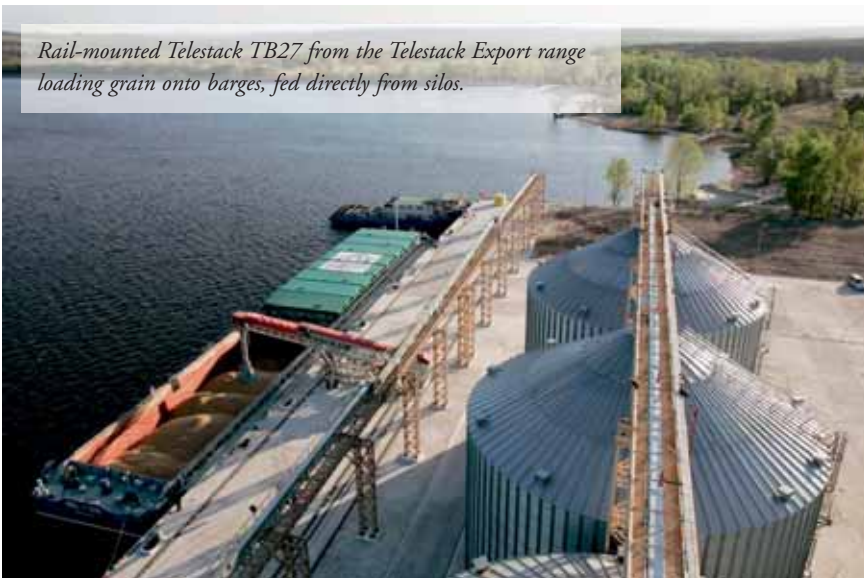
complete range of jetty/quayside designs. In addition, the All Wheel Travel Option allows each wheel to move independently, offering the operator the maximum level of

flexibility and mobility in an often restricted area, as well as the fastest hatch to hatch transfer time, particularly when loading a geared vessel.

With grain loading rates of up to 1,500tph (tonnes per hour), the TB Export radial telescopic range is available up to 58 metres (190ft) and has a typically lower capital investment required than fixed shiploading systems. With the system often available within a 10–30 week timeframe (depending on the specification), the mobile system has reduced civil requirements on site and can be designed to suit a range of materials including grains, coal, fertilizers, ores, aggregates, woodchips and can be easily fed from wheel loaders, trucks, overhead conveyors, tripper/ fixed conveyors and drag chain gantries.

Philip Waddell, International Sales Manager for Teleslack explains how the Teleslack brand has a wide coverage in the Ukraine “Teleslack installed the first mobile

Rail-mounted Teleslack TB27 from the Teleslack Export range loading grain onto barges, fed directly from silos.





Telestack
Mobile Bulk Material Handling



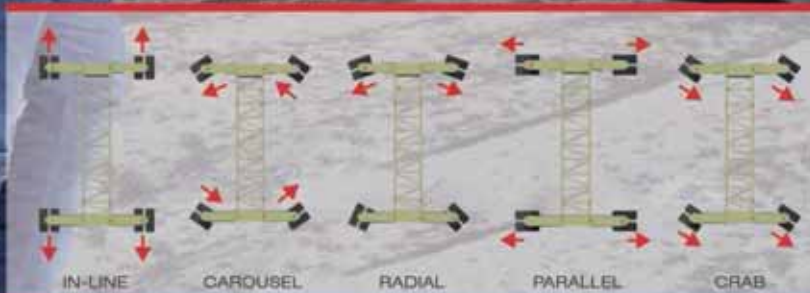
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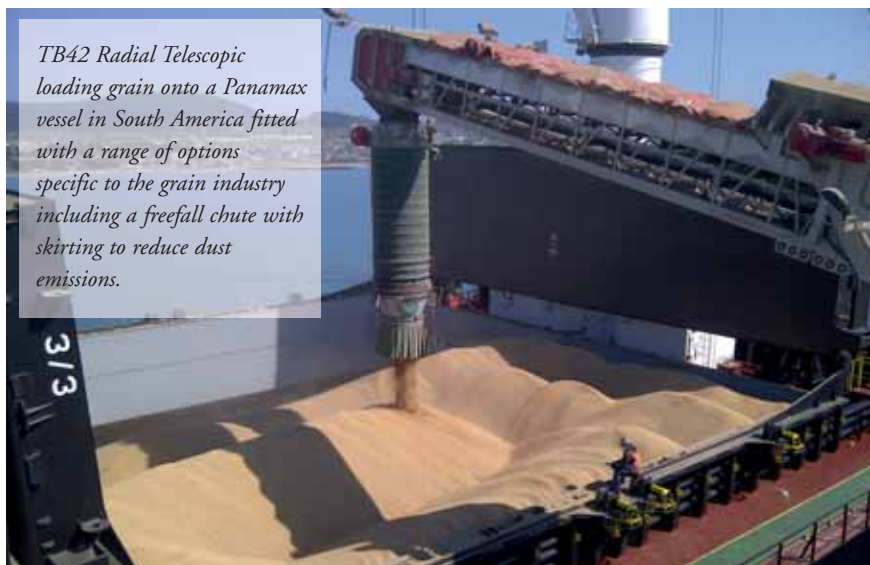


radial telescopic shiploading system in Ukraine in 2010. It was a rail-mounted 27-metre radial telescopic conveyor working in the river terminal on the Dnieper River and is still operational today running at a production rate of 200tph. This particular system previously won an award for 'Best Shiploading/Unloading System' and further repeat orders have been placed for the same design. Based on the solid reputation and performance of this installation, Telestack have now over 25 systems in Ukraine serving some of the largest names in grain industry all with different requirements. Some of the installations

The TB52 All Wheel Travel incorporating a range of steering modes to allow maximum mobility in restrictive quaysides and flexibility for optimized hatch-to-hatch changing times, making it an ideal investment for anyone loading geared vessels.



TB42 Radial Telescopic loading grain onto a Panamax vessel in South America fitted with a range of options specific to the grain industry including a freefall chute with skirting to reduce dust emissions.



link conveyors to load grain onto Handymax vessels. The range of steering modes offered by the All Wheel Travel feature allows the unit to literally turn 360° with ease, speed and accuracy and gives the operator unrivalled flexibility and mobility ensuring the fastest hatch to hatch change in the market, particularly when loading a geared vessel. Furthermore the versatility of the equipment ensures that it can be used in all parts of the logistics chain (Shiploading/ Stacking) making it a solid investment for terminal owners and operators," concludes Waddell.

Renowned for its innovative approach, Telestack continues to incorporate its experience into each design and is

have been rail-mounted systems that load directly from silos and conveyors, some included hopper feeders but more recently we have also seen a rise in the demand for radial telescopics fed from a Titan Bulk Reception feeder.

"We have also recently dispatched a package of shiploading equipment to a grain application at the Port of Varna in Bulgaria that consists of two TB 52 Export All Wheel Travel Radial Telescopics, a wheeled Titan Bulk Reception feeder and a range of

Titan T388-4 barge-loading grain direct from trucks in the Port of Barranquilla in Colombia.



LDU 521 cambered boom radial shiploader loading grain to coaster vessels direct from centre hatch of trucks.



considered one of the key pacesetters within the bulk handling industry. Its specialized ports and terminals division is dedicated to ensuring that each installation is specific to the needs of each particular application and site conditions. Telestack's success is evident across the globe, and how it continues to evolve and innovate is testament to its commitment to the industry. The company offers a comprehensive product range, including: ship loaders and unloaders, hopper feeders, truck unloaders, bulk reception feeders, stockpiling conveyors, link conveyors and telescopic stackers.

Grain cleaning – an essential step in the handling process

Different trends in food safety and climate all point in one direction: adequate grain cleaning is paramount to profitable grain processing and to fighting post-harvest food wastage, writes Marina Hirschberger, Product Manager, Bühler Grain Logistics.

On the one hand crop failures, fungus contamination or moist crops may jeopardize food security: either the yield is too low, or the grain is contaminated with dangerous toxins, or moist crop is prone to mould and rots during storage, thus leading to food



wastage. On the other hand, the demand for safe and nutritious food is on the rise, due to stricter hygiene guidelines demanding higher quality, and the growing world population requiring a larger quantity. The solution to both challenges lies in careful and appropriate grain cleaning — it increases storage life of the grain, improves product quality and enhances production reliability as well as profitability.

STEP-BY-STEP CLEANING

Depending on the requirements, grain cleaning consists of different steps. The basic step at the collection point always consists of sifting and aspirating. This is how foreign particles such as straw, bigger stones, paper, pieces of wood or corncobs — but also lighter grains, which might be contaminated, or in-length broken grains — can be eliminated. Moreover, compromised surface quality of the grain can also be dealt with through surface abrasion while sifting, as well as through specialized hulling machines. Basic cleaning accounts for approximately 90% of grain cleaning. In subsequent steps, the grain can be sorted according to highly specific parameters, which include practically every physical property ranging from size to discolouring thanks to trieur graders and Sortex machines.

STRIKING A FINE BALANCE

All these steps can be adjusted and combined depending on which kind of grain quality is intended. If grain is being processed to become animal feed, naturally



Bühler TAS Universal cleaning machine.



different guidelines apply than if it is destined for human consumption. Then, depending on the application — whether milling, seed processing or malting — companies may also diversify their product for basic or premium ranges. Depending on the region where the finished product is to be sold, also different guidelines or preferences might apply. The art of adequate grain cleaning consists in the fine balance between sorting waste product without including too many good grains. Perfectly adjusted grain cleaning will guarantee optimized product quality with good profitability.

BASIC CLEANING WITH SIEVE AND ASPIRATION

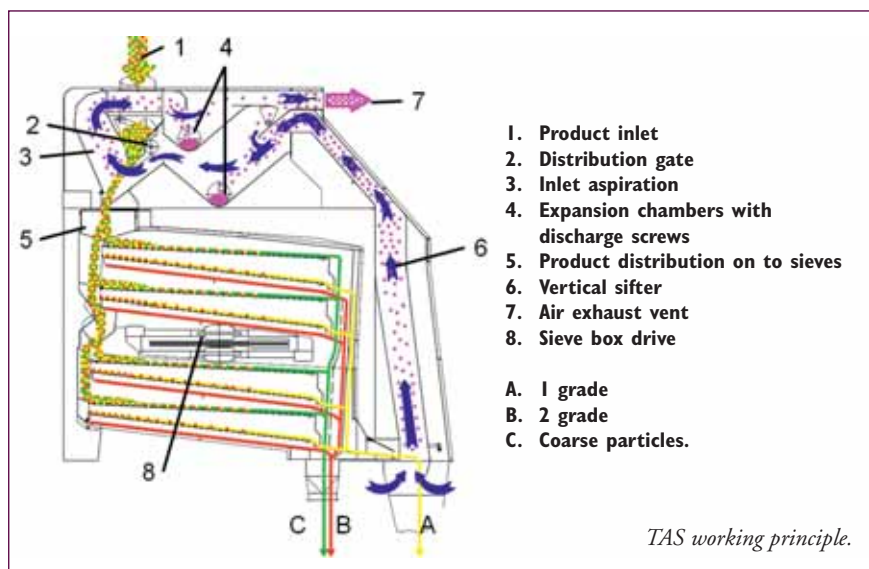
The core machine for basic grain cleaning, grading and aspirating is the universal cleaning machine TAS. The machines from this series are optimally suited for applications in plants for the reception and storage of grain and other bulk materials, port facilities, mills, silo and storage plants, seed processing plants as well as malting plants. Thanks to the large number of screens in limited space and the tried and tested plansifter technology, high throughput rates can be attained while only small space is required.

FUNCTION OF A UNIVERSAL CLEANING MACHINE

The product which has to be cleaned is distributed via a weighted vibration flap or an optional automatic inlet regulator over the whole working width of the machine. This enables an undisturbed feeding of the sieve box, even with very moist grain. The inlet aspiration system serves to remove light particles (dust, husks) which are discharged with the help of a screw conveyor and prevent the sieves from getting choked by the chaff.

The so pre-cleaned product is spread to the different pre-screen layers where the coarse particles (big impurities) are separated out of the product. The grain which falls through the pre-screens gets separated via the main-screens into the first grade (good product) and the second grade (small and broken kernels).

The first grade is aspirated again in the vertical sifter with adjustable cross-section to get out light particles which were generated through the friction of the kernels on the sieves. The outlet hoppers for the second grade and the coarse



TAS working principle.

particles are arranged underneath of the machine.

In general the aspiration of the product is an important must because dangerous environmental pollutant and mycotoxins are mainly on the surface of the kernel. Through the separation of the light materials the contaminant loads of the cleaned product is dramatically reduced.

A particularity of the TAS machine is the fact that the inlet and outlet aspiration system is connected. The twice-over use of

CONCLUSION

A huge number of different cleaning principles for grain is available. This article has introduced only one of the most common techniques of mechanical cleaning. Hygienic requirements and grain will increase in the future more and more. Therefore grain cleaning is and will still be an essential step in the process from grain from the field to the end-user and requires a continuous development of cleaning principles.



the aspiration air ensures less working costs (reduction of air volume) compared with separated systems, but high effectiveness at the same time. Easy control of the cleaning results is facilitated by different separator chambers for inlet and outlet aspiration.

Options like pneumatic screen switch-over flaps which allow different grades to be loaded without changing the sieves, or wear protection with rhino hyde are features which support a safe and economical working.

ABOUT BÜHLER

Every day, billions of people come into contact with Bühler technologies to cover their basic needs for food and mobility. The company strives for innovations for a better world, with a special focus on healthy, safe, and sustainable solutions. It contributes significantly to feeding the world's population, while setting the focus on food security and safety. Its solutions and technologies enable efficient and clean mobility.

Bühler is a major presence in processing grains, rice, cocoa, coffee, and other raw materials. Also, it is a renowned solution provider of die-casting and surface-coating technologies in high-volume application areas, such as automotive, optics, and inks. As a prominent technology group, Bühler invests up to 5% of its turnover every year in research and development. In 2016, its 10,640 employees in over 140 countries generated a turnover of CHF 2.45 billion. The globally active Swiss family-owned company Bühler is particularly committed to sustainability.

Maquinas Condor equipment handles a range of cargoes, including grain

Maquinas Condor's Combitower 1500/800, which can load and unload vessels simultaneously and (inset) shown operating alongside a 1987 model.



Multiport M300.



hour), while the new model offers 800tph. The old unit's loading rate of 600tph, while the new one's is 1,500tph. The old belt conveyor offered a maximum capacity of 600tph, compared with 1,500tph with the new model. The equipment is able to handle all types of agribulk, with capacities varying according to the commodity being handled.

The picture, left, shows the company's Multiport M300 pneumatic ship unloader,

Neuro's KIKO device.



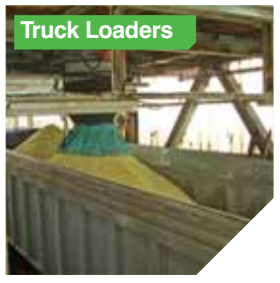
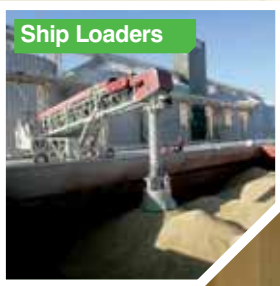
Maquinas Condor SA is a major Brazilian manufacturer of bulk handling equipment. Its products include: ship and barge loaders; ship and barge unloaders; mobile pneumatic conveyors; mechanical conveyors; and reclaimers.

Grain is one of the commodities handled by equipment from Maquinas Condor. One of the latest projects for grain handling is the supply of a very

sophisticated Combitower 1500/800, which can load and unload vessels simultaneously (see pictures, above). The unloading operations are pneumatic. The inset picture shows the installation in Nueva Palmira, Uruguay, with the new equipment, working alongside an older model, which was delivered by Maquinas Condor in 1987. The old unit has a pneumatic unloading capacity of 500tph (metric tonnes per

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*Bag shiploader from
Maquinas Condor.*

with a capacity of 300tph. These units can be delivered in a range of capacities — 300, 400, 500 and 600tph.

Maquinas Condor has a close relationship with its partner company, Neuero. On p84 is a picture of Neuero's recently developed KIKO dust-controlled

device, which enables shiploading to take place almost dust-free, at a very low operational cost.

The picture, above, shows a Maquinas Condor bag shiploader alternative, which loads bags directly into the vessel's hold at a rate of up to 3,000 bags per hour.

Maquinas Condor's pneumatic equipment works ideally with grain, corn, soya etc., but is also supplied for the handling of alumina. Right now, Maquinas Condor is heavily involved in the supply a plant to handle and store coal for a new thermoelectric plant in southern Brazil.

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Keeping a watchful eye on quality with Alex Stewart Agriculture



Grain and oilseed inspection and analysis are core businesses of Alex Stewart Agriculture Ltd. Alex Stewart is a superintendent and analyst member of the Grain and Feed Trade Association (GAFTA).

Alex Stewart works with many leading grain traders by providing trustworthy professional inspection and laboratory services globally. In addition, ASA can arrange fumigation services in most areas of the world to ensure that its customers' cargoes are treated as with the greatest care.

Upon nomination, Alex Stewart's mission is to protect customers' interests at loading and/or discharge ports worldwide. ASA is also able to provide collateral management services such as supervision of long term storage of grain or control of transportation between storage facilities.

The head office of Alex Stewart Agriculture Ltd in the UK also provides consultancy services. Strategically and commercially located operations offices offer support and advice regarding ports and silos worldwide and will provide information concerning the latest industry standards in sampling and analysis.

AGRICULTURAL LABORATORIES

Huson & Hardwick and A. Norman Tate Laboratories are GAFTA/FOSFA (Federation of Oils, Seeds and Fats Associations) registered analytical laboratories that specialize in the analysis of oilseed and edible oil, grain, barley, rye and wheat, animal feed, sugar and food products operate from Alex Stewart's head office in England. They are able to perform a full range of commercial and shipping sample including protein, fat, fibre, ash, moisture analysis via classical wet chemistry and hi-tech instrumentation including NIR (near infrared), ICP (inductively coupled plasma) and HPLC (high performance liquid chromatography); also infestation, foreign matter and admixture, hazardous contents, fuzarious grains, nutritional values, toxic contents (eg. arsenic, mercury & lead) mycotoxins and pesticides.

DRY BULK COMMODITIES CERTIFIED BY ALEX STEWART

FERTILIZER

Alex Stewart Agriculture's highly experienced and knowledgeable inspection team has built a trusted reputation within the international fertilizer-trading arena.

The fertilizer division offers first class inspection and analytical services for bulk, bagged and liquid fertilizer with the aim of protecting client's interests at production site, during transportation, or at store. ASA has fertilizer laboratories in the UK, Belgium, Ukraine, Russia, South Africa, China and India. Its offices in the UK, Belgium and the Ukraine are all members of the International Fertilizer Association.

ANIMAL FEED

The Alex Stewart Group provides a fully comprehensive package of inspection and analytical services. Its GAFTA/FOSFA-registered and approved laboratories strategically located around the world perform a full range of analysis for soya, oilseeds – sunflower and rape, and fish meal including infestation, foreign matter and admixture, hazardous contents, fuzarious grains, toxic contents (eg. arsenic, mercury & lead) mycotoxins and pesticides.

GRAIN AND WHEAT

Grain inspection and analysis is a core business of Alex Stewart Agriculture and is a superintendent and analyst member of the Grain And Feed Trade Association

Your Global Network of Inspection & Analytical Laboratory Services



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Alex Stewart Agriculture provides world-class FOSFA and GAFTA approved independent inspection and laboratory services. Supported by the A. Norman Tate and Huson & Hardwick Laboratories, our analytical, inspection and certification services facilitate the international trading of soft commodities, including sugar, oils & fats, bio-diesel, cereals, fertilisers and other food products.

Today, the network of regional Alex Stewart companies spans over 40 countries and delivers fast, flexible and comprehensive inspection, analytical and laboratory services to the agricultural industry, with coverage at all major ports and receivers. By maintaining a dedicated, friendly and trustworthy business relationship with clients, ASA provides unparalleled technical support.

Our mission is to provide professional inspection and analytical services that conform to internationally accepted standards – and, by meeting all contractual specifications, to protect clients from unnecessary financial claims. Our inspectors are conversant with all accepted sampling and weighing procedures.

A Name To Trust In Business

Inspection and analytical services combining a unique competence – ASA employs qualified, experienced chemists and inspectors to deliver precise and prompt quantity and quality reports and certificates. Our professional and knowledgeable team provides a dedicated, high-quality service that meets the specified requirements and demands of the agricultural sector including traders, producers, governments, banks and financial institutions and the general public.



Alex Stewart (Agriculture) Ltd

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E: glenn.forbes@alexstewartagriculture.com
www.alexstewartagriculture.com

Alex Stewart Agriculture bases its activities on the principles of responsibility, impartiality, professionalism and confidentiality.

Main Activities

- ◆ Inspection services
- ◆ Laboratory and Analytical Services
- ◆ Weighing, sampling and sample preparation
- ◆ Quantity & Quality reports
- ◆ Certification
- ◆ Technical consultancy services
- ◆ Training

Inspection Services

- ◆ Pre-shipment inspection
- ◆ Proof on arrival inspection
- ◆ Vessel condition surveys
- ◆ Supervision of bulk cargoes – load/discharge
- ◆ Weighing, sampling and sample preparation
- ◆ Stockpile sampling
- ◆ CMA, goods release and warehouse control
- ◆ Radioactivity testing

Laboratory Services

- ◆ Commercial analysis
- ◆ Production analysis
- ◆ Oilseed analysis
- ◆ Sample preparation
- ◆ Traditional wet chemistry
- ◆ ICP/AA
- ◆ HPLC
- ◆ GC-MS



(GAFTA), working with many leading grain traders by providing monitoring, testing and consultancy services globally. In addition fumigation services can be offered as ASA works closely with fumigation companies to ensure that cargoes are loaded and stored in appropriate condition and quality is not affected during transportation. Grain inspection services also extend to provide collateral management services such as supervision of long-term storage of grain or control of transportation between storage facilities.

QUALITY INSPECTION SERVICES

Warehouse inventory control and collateral management: ASA can provide a diverse range of services, from stock audits and control procedures, to security advice and commodity/store condition surveys.

- ❖ **pre-shipment inspection and analysis:** the Alex Stewart inspection team will check that the customer's product is within specification and fit for the intended use.
- ❖ **quality control:** checking that cargo conforms to contractual specifications, checking cargo for signs of contamination, odour, colour change, moisture levels, friability, protesting/rejecting inferior cargo on sight, granule



- sizing, radioactivity testing and laboratory analysis.
- ❖ **vessel hatch inspection:** service includes checking hatch condition ensuring that they are free from loose rust and paint flake, free from previous cargo, checking that hatches are tight fitting, checking hatch open and closing operation is functional and timely, inspecting hatch rubber condition, hatch hose water testing, checking that holds are water-tight.
- ❖ **vessel hold cleanliness:** detailed inspection ensures that holds are clean, dry, free of loose rust and paint flake, free from previous cargo, free from infestation and odour and in every respect fit to receive the designated cargo.
- ❖ **continuous supervision:** ASA guarantees continuous supervision of customers' cargo loading and/or discharge (24 hours), representative sampling/sealing as per contract.
- ❖ **quality control inspection:** packaging reporting when applicable.
- ❖ **weight verification:** gross, tare & net weighing.
- ❖ **weighbridge control:** test weight checking, scale calibration and certification check, recording truck movements across scale ensuring that all cargo is weighed.
- ❖ **bagging supervision and tallying:** full tally and checking for bag strength and durability (laboratory testing is available) and verifying markings.
- ❖ **continuous information updates:** ASA's busy administration centre is in contact with all of its inspectors operating in the field and provides its customers with up-to-date, hour-by-hour detail of all loading and discharging operations.
- ❖ **documentation:** Alex Stewart Agriculture uses state-of-the-art technology to supply standardized reports and certificates; certification and reporting can be tailored to suit customer requirements. Photographic reports by conventional and digital camera can also be supplied for evidence purposes.
- ❖ **damaged cargo assessment:** establishing possible source, cause, and severity.
- ❖ **loss prevention:** supervision of reconstitution of acceptable cargo.
- ❖ **container services:** supervision of stuffing and unstuffing, container sealing, container condition surveying (on/off hire, damage assessment).
- ❖ **transportation services:** whether the commodity is manufactured, stored, shipped, railed, trucked or containerized, ASA can assist customers in their trading activities.
- ❖ **consultancy:** ASA offers consultancy services to assist customers on methods concerning material handling, weighing, transportation, sampling and analysis. Local knowledge and years of experience are primary assets of its business.

KEY AGRICULTURAL GAFTA/FOSFA SUPERINTENDENT OPERATIONS WITHIN ALEX STEWART AGRICULTURE

Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, Egypt, Estonia, Germany, Italy, India, Indonesia, Kazakhstan, Latvia, Malaysia, Netherlands, Peru, Philippines, Romania, Russia, Spain, Thailand, Turkey, Ukraine, UK, Uruguay & USA.

Bedeschi never stops growing: a new challenge in the cereals sector

Major bulk handling equipment company Bedeschi has remained faithful to its company ethos ever since it started business as a supplier of equipment for brick manufacturing. The company focus has moved on to include gas, bulk handling equipment and marine installations. Bedeschi has now announced the latest addition to its range of bulk handling equipment.

The company has just won an order from Marghera, Venice in Italy, for a CSU 900/29.5 rail-mounted continuous ship-unloader, which will handle soya beans.

This equipment, with a rated capacity of 800tph (tonnes per hour) can unload vessels up to Panamax size. It will be built and tested in Bedeschi's Italian workshop, which offers the latest technologies, tools and facilities for the perfect machining and testing of these special items.



The scope of supply comprises a fully erected ship-unloader, which will demonstrate Bedeschi's ability to satisfy the specific needs of the customer, and which

also meets the current market trends for this type of equipment.

The 'fully erected' solution means that the machine will be delivered fully assembled directly to site, and will not need to be assembled in place.

This approach was proposed to maximize customer convenience, and to minimize assembly and commissioning time on site. This is very important, especially when activities at the destination site cannot be interrupted, and/or when it is difficult to reach the site by land.

The unloading system of the CSU is based on the proven chain elevator technology, which enables lowest power consumption, gentle handling of the material, and compliance to the most stringent environmental regulations, as well as simple and inexpensive maintenance.

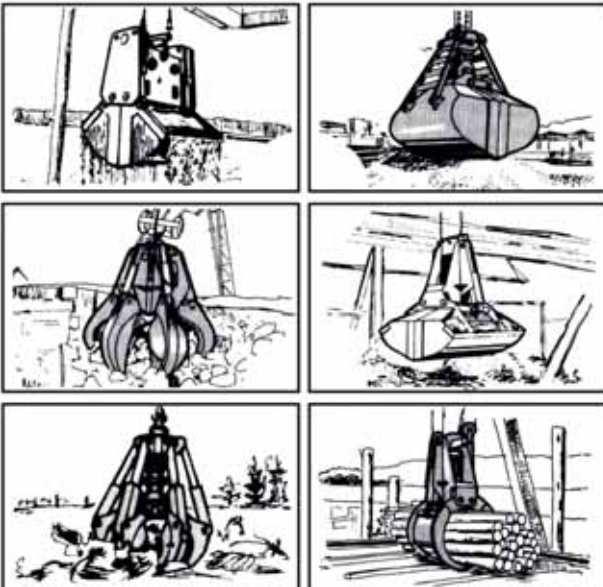
The chain elevator features a hydraulic kick-in kick-out system to optimize the coverage of hold volume, increasing total unloading efficiency. Because of the abrasiveness of the material to be handled the chain elevator, boom chain conveyor and chain conveyor connecting to the quay belt conveyor have been specifically designed to prevent wear, using high hardness special steel and easy-to-replace wearing plates.

Bedeschi is able to provide a complete line of mechanical continuous ship unloaders for cereals and other materials with capacities ranging from 300tph to 1,500tph, able to operate on rails or rubber tyres on any quay or jetty. They can be used to unload vessels of up to 150,000dwt.

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Golfetto Sangati's grain handling systems benefit from over 90 years' experience



Golfetto Sangati is an Italian company that designs, builds and installs turnkey plants for grain handling and milling. The company is a reference point for the design and construction of complete systems for storage, loading and unloading ships with free-flowing or non-free-flowing materials such as wheat, corn, barley, soyabean, sunflower seeds, rapeseed, coffee, rice, soya meal and others.

The company has designed and built tens of handling systems and port installations all over the world.

GRAIN HANDLING PLANTS AND EQUIPMENT

Golfetto Sangati is one of the few companies able to design, manufacture and install full handling systems from the grains receiving section (intake from trucks or wagons or ship-unloading equipment) to storage facilities and cleaning equipment up to loading equipment (truck or wagons or shiploading equipment).

Golfetto Sangati's grain handling solutions are mainly categorized by:

- ❖ intake;
- ❖ cleaning/treatment section;
- ❖ silos and other storage systems;
- ❖ chain conveyors;
- ❖ belt conveyors;
- ❖ bucket elevators;
- ❖ bulk load-out systems for truck and wagons loading; and
- ❖ in-house designed continuous feeding system on the quays.

Each design for a new handling or storage system originates in the company's Italian facilities, where the design and R&D teams work on the design until the final version. The mechanical elements and the construction elements are built in the same facility.



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Del Sur S.A



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In challenging projects, it is necessary to consider several factors associated with the location of installation and the operational procedures.

Golfetto Sangati conducts a preliminary investigation taking into account all those factors and subsequently develops the most appropriate solution for all the requested elements. It supplies the most efficient handling solutions that work with the local environmental conditions, and with a view to minimizing energy consumption, dust and spillage.

RECENT HANDLING PROJECTS

- ❖ **Cocoa beans project** in Toronto (Canada), providing for the design, manufacture, delivery of cleaning/storage system for cocoa beans. The capacity of the plant in intake and cleaning phase is 30tph (tonnes per hour) in intake. The plant is also equipped with a bulk load out station (capacity 60tph) in order to deliver raw material to chocolate manufacturers.
- ❖ **Brown Bear project** in the Egyptian port of Alexandria, provides for the design and manufacture of high-capacity chain conveyors (1,400tph loading/700tph unloading) and storage steel silos (54.000 tonnes).



- ❖ **Canopus project** is a contract for the design, manufacture, delivery and start-up of a new shiploading terminal in the Port of Costanta (Romania). The scope of supply includes one Transload mobile shiploader, rated at 800tph, and the full storage and handling equipment from truck intake to storage and ship load-out. All equipment has been designed and built according to the client's particular specifications.
- ❖ **Rostov Fluvial Port project** in Russia is the refurbishment of an existing plant to

increase the initial handling capacity up to 400tph. The scope of supply incorporates chain conveyors, belt conveyors and bucket elevators all design in compliance with the local environmental conditions (-25°C).

- ❖ **Lesiolo Project** in Kenya consists of the extension of storage silos (18,000 tonnes) and 100tph mechanical handling system and bulk load-out system for truck loading with the installation of special dust suppressor combined with gross flow measurement system.



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Steps for a custom grain-handling facility



Dome Technology can engineer a customized handling system for any dome storing grain.

When planning a storage facility for grain, size is a major consideration, but cost, customization and product protection are paramount too, writes *Rebecca Long Pyper* for *Dome Technology*. More grain producers are selecting a DomeSilo™ from Dome Technology for these reasons and more. Here's the process for planning a new dome project and the benefits customers receive when the project is done.

1. ENGINEERING SERVICES

With front-end engineering design (FEED), Dome Technology's design-build team can quickly provide preliminary plans within an acceptable $\pm 1\%$ estimate that lets customers determine if a project's scope fits within budget. Dome Technology's team determines costs by being as specific as possible in the early stages of engineering, yielding relatively accurate numbers from the get-go.

This foresight is made possible in part by value engineering. Whether you're a farmer in Nebraska, USA, moving grain onto railcars post-harvest or a major canola producer storing product in Canada, Dome Technology's engineers analyse each project to come up with innovative ways to accomplish tasks with less money.

Even when the stored material is the

same, every project is unique and deserves individual attention. Dome Technology's team meets with customers to nail down the details for a dome's proposed function. Need to fill and empty a dome once a year? Once a month? Dome can conceive the optimal plan for a custom dome and material-handling systems within and around it.

To save on costs, engineers rely on years of experience to craft the ideal plan, and they try innovative ideas too. That might mean conveyor supports sharing a foundation with the dome, resulting in substantial construction savings. Or it might mean building a ramp that will work for today's dome but is also designed to function with adjacent dome likely to be built years later. By seeing the potential, the company's team incorporates future growth into today's design.

2. COMPETITIVE PRICE, CONSISTENT STORAGE CONDITIONS

For companies seeking the most storage for the best price, a dome competes with the cost of other systems but offers increased peace of mind based on strength of construction. A dome's steel-reinforced concrete shell easily accommodates frequent loading and unloading; with no

seams or bolts, no areas are prone to stress concentration. Also, the insulated nature of the shell prevents interior temperature fluctuations that could cause condensation.

3. PROTECTION FROM HEAT, FIRE AND EXPLOSION

To minimize the risk of fire, aeration systems are customized to meet the needs of different types of grain. "The systems we've used in the past are designed specifically for aerating and maintaining moisture and temperature in grain, and they can typically keep it within 1–2% of desired moisture content," engineer for Dome Technology Adam Aagard said.

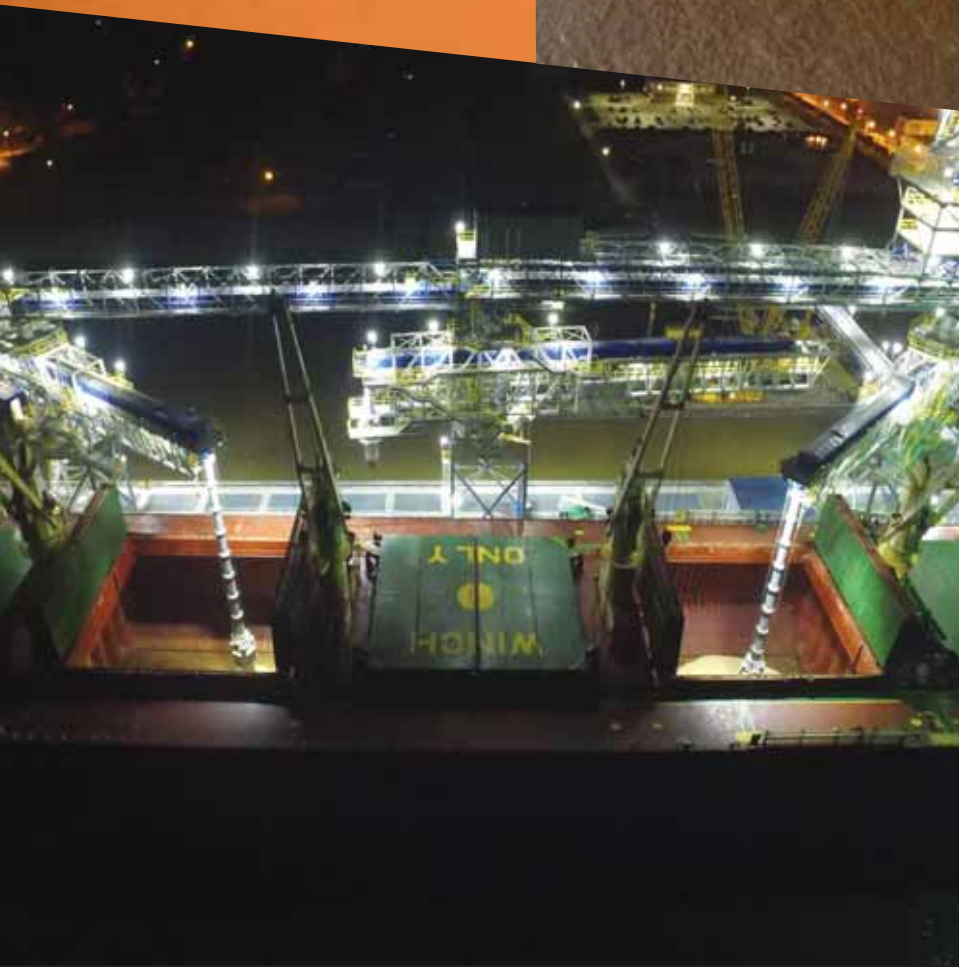
If product comes in hot from sitting in the sun post-harvest, an aeration system can be designed to pull off heat; in the process, it may also pull off moisture, which helps keep humidity levels ideal. Pre-cooling systems are common for facilities storing product like canola and can be engineered into a dome, Aagard said, and temperature cables also alert customers when the environment ceases to be ideal.

By working with Dome Technology's team, companies can achieve a customized, economical grain-storage facility that holds more product and protects it too. These are the advantages being realized today by dome customers storing grain. **DCi**

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Time to take cover?

enclosed storage solutions



The Legacy fabric structure at ADM Terminal Services' bulk fertilizer warehouse in Camanche, Iowa.

Louise Dodds-Ely

Fabric structures for bulk storage

Flat storage buildings can have several advantages for bulk cargo storage: they can easily be reconfigured as operations change, and they have greater capacity than vertical storage solutions. By combining the proven strength of an engineered steel frame with rugged fabric cladding, Legacy Building Solutions offers fabric structures that are designed to increase operational efficiency, last longer and save money when it comes to cargo storage.

ADVANTAGES OF FABRIC STRUCTURES FOR PORT STORAGE

Fabric buildings have several advantages for bulk cargo storage, including natural light, corrosion resistance, non-conductive properties and faster construction.

Structural fabric has up to 16% translucency, which allows sunlight into all areas of the building. On a sunny day, the fabric translucency allows enough natural light into the building to safely work and

operate equipment. Fabric structures are free from dark, shadowy corners, which also contributes to a more pleasant environment for those inside the building.

Fabric is non-corrosive, even in the presence of corrosive materials (salt, fertilizer) and damp environments. The fabric cladding is free from pitting and reactions that can cause oxidation to damage the building and the materials stored inside.

Independent studies have shown that fabric structures provide a more airtight building envelope than steel-clad structures. Air leakage through screw holes can be the number one factor for heat or cooling loss in a metal building. All these holes are eliminated in a fabric building, providing superior performance. Fabric also has non-conductive properties, further enhancing the building's environment during hot or cold days.

NON-CORROSIVE: CENTRAL VALLEY AG

Central Valley Ag is a co-op that sells, blends and distributes fertilizer from its location in Tamora, Nebraska. When it needed to replace a facility badly damaged by corrosion, the company chose a fabric structure on a rigid steel frame, with an interior fabric liner to seal the frame from corrosive fertilizer.

"The damage to the old building cost hundreds of thousands of dollars over the years," said Dan McBride, operations manager at Central Valley Ag. Protecting the building frame from exposure to fertilizer was a primary consideration for the job. By adding a fabric liner to the interior of the building, Legacy Building Solutions created a building that seals the frame and prevents corrosive fertilizer from damaging the steel.

The building also has two ventilation systems: one for the main building, and another for the cavity created by the liner,



PIONEERING SPIRIT

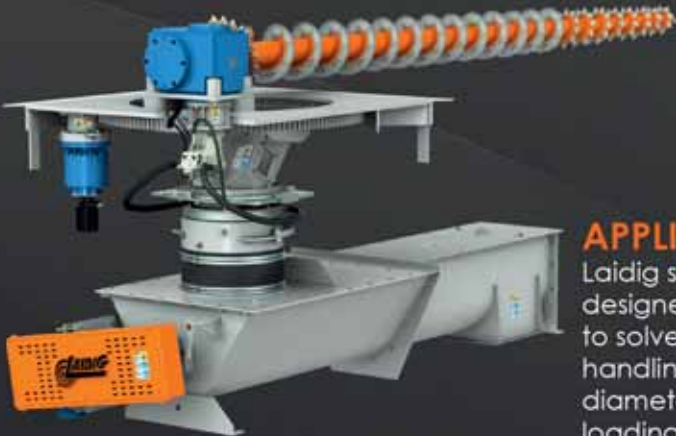
With over 50 years of pioneering innovations, Laidig is recognized world-wide as a leader in the bulk storage and material handling industry. Laidig is continually involved in cutting-edge development to offer customers the best solutions for their storage and reclaim needs.

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.

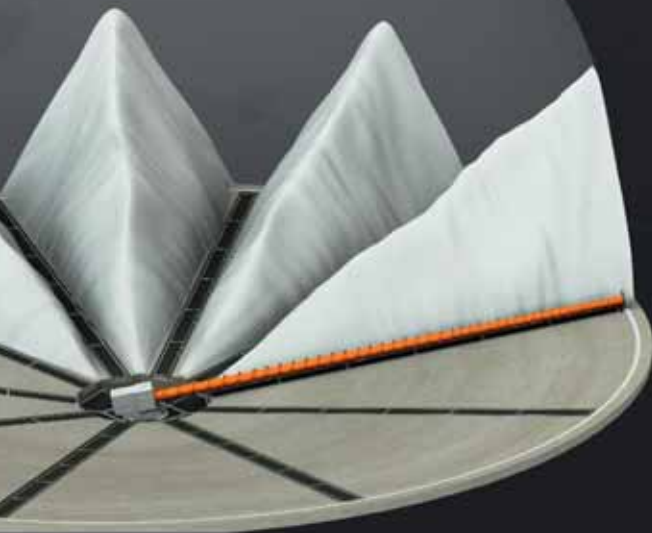


APPLICATION SPECIFIC

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.





Inside the Legacy building constructed for Central Valley Ag in Tamora, Nebraska.

which serves to prevent condensation build-up on the steel frame. Both systems use peak ARV vents, mesh soffits and aluminium endwall vents to create a complete passive ventilation system. “We liked the ventilation options in the Legacy building,” said McBride. “Moisture causes problems for us beyond just rust — it causes cleanliness issues and product loss.”

CUSTOM DESIGN: ADM TERMINAL SERVICES

ADM Terminal Services uses a fabric structure to blend and distribute bulk fertilizer at its Camanche, Iowa, warehouse. The building is designed to store fertilizer in pre-cast concrete bins, and a lean-to

provides a clear drive path for distribution.

Six concrete bins are located in the main building area, which measures 108ft wide by 480ft long. The lean-to is 50ft wide by 330ft long, for a total of 68,340ft². A large conveyor runs over the bins to make loading quick and efficient. The lean-to is customized with overhead doors to allow trucks access and egress to the facility.

“Lean-tos are a great way to add a loading area without reducing the available storage space,” said Paul Smith, Building and Project Design Consultant at Legacy Building Solutions. “By creating a separate space for trucks and loaders, everyone in the building can work safely and quickly.”

EXPEDITED CONSTRUCTION: PONTOTOC SANDS COMPANY

When fracking operations increased around El Reno, Oklahoma, Pontotoc Sands Company needed a frac sand storage building in the area. Fracking is a fast-moving industry, so the building needed to be ready to use as quickly as possible. Portability was also a factor, as fracking hotspots can change quickly.

“I like these fabric structures — they are cost-effective to put up, you can put them just about anywhere and you can move them to a new location as our hotspots change,” said Josh Lehde, owner of Pontotoc Sands Company.

After contacting Legacy in late December, Pontotoc Sands Company had its new 8,000ft² fabric structure designed and constructed in seven weeks. Legacy crews also installed two other fabric buildings which had been purchased from another manufacturer but never installed.

NEW PRODUCT: FABRIC STRUCTURES WITH EXXOTEC™ FABRIC

Legacy Building Solutions recently introduced ExxoTec™, a PVC fabric that outperforms PE fabric in initial strength and strength-after-weathering tests — while maintaining a similar price point. Fabric buildings using ExxoTec™ are warranted for up to 25 years, even when used for corrosive storage or in harsh or damp environments.



Frac sand storage at Pontotoc Sands' facility in El Reno, Oklahoma.



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How MegaDome® buildings can solve bulk product storage needs

Storing dry bulk products can be really challenging. The building's construction site can be difficult to access, the installation needs to be quick and the structure has to respect the building code of the location where it's built.

It requires a building that keeps the products dry and accessible year-long while having a clear open space to maximize storage capacity and facilitate handling operations as well as the movement of heavy machinery.

MegaDome® engineers fabric buildings that provide a fast and cost-effective solution to all bulk storage needs. They are designed for the industrial, municipal and agricultural sectors to protect bulk products like minerals, coal, cereals, wood, salt and manure while keeping them dry and accessible all year long, even during winter. These buildings also help with inventory management by limiting losses of products.

CONSTRUCTION CHALLENGES

MegaDome®'s in-house engineering team conceives buildings that can fit entirely in one container (or a couple of containers depending on their size), allowing an efficient delivery and a quick installation wherever the construction site is located. The type of ground can have a major impact on the construction and costs. This is why the company developed a wide range of foundations to adapt to all kinds of grounds, the most popular of which are concrete blocks that require very little excavation.

MegaDome®'s engineers design custom buildings that meet municipality standards and requirements. They also stamp plans making it easier to get a fast approval for mostly any kind of project. The designated expert on the project supports the client during the entire approval process making sure all the right documents are available and presented.



Construction site of an AR series building.

MEETING THE NEEDS OF BULK STORAGE

MegaDome®'s innovative design features no central column and large wall clearance offering an important storage surface and an open space to facilitate the circulation of machinery. The structures are built with oval tubing, making them more resistant than round and rectangular tubes of similar dimensions. The company's in-house engineers can adapt the structure to specific loading equipment and conveyors, like airtight openings for equipment that needs to go through the membrane.

The lower section of the arches, which is the most exposed to dirt and corrosive elements, is always hot dipped after welding to ensure the protection of the steel and the durability of the structure. The structure can also be hot dipped for extra protection. MegaDome®'s fabric buildings can easily be extended after installation if needed.

MegaDome® buildings can be customized with many industrial options like single or double roll-up openings, side garage doors and ventilation systems, which are very useful when storing bulk goods. With more than 50 years of experience in the greenhouse industry with Harnois Greenhouses, the company developed high-performance ventilation systems that it adapted to its buildings. Its in-house engineering team can design a building to meet precise ventilation needs ensuring the products stay dry in all conditions and weather.

The structure is then covered by a

PowerShield® membrane that allows natural light to penetrate the building easily all year long. It reduces the need for artificial light, which can add up to considerable energy savings. This durable waterproof and fire-resistant membrane is assembled at MegaDome®'s factory to ensure its quality.

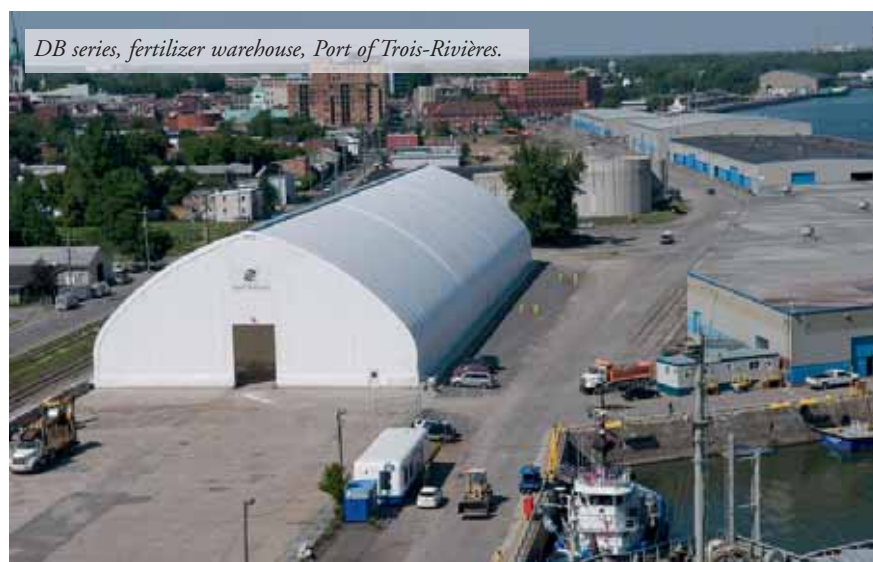
ADAPTED STORAGE FOR PORTS

One of MegaDome®'s clients, the port of Trois-Rivières, needed a warehouse to store fertilizer. The foundation wall had to be installed on an existing concrete base that was more than 100 years old. After analysing the quality of the concrete foundation, MegaDome®'s in-house team of engineers customized the plans to adapt the construction to this specific need. It was then able to install ten-foot walls on floating, above-ground foundations. The foundation base and wall were thickened to alleviate the pressure the product could exert on the walls.

EVEN GREATER INTERIOR CLEARANCE WITH THE AR SERIES

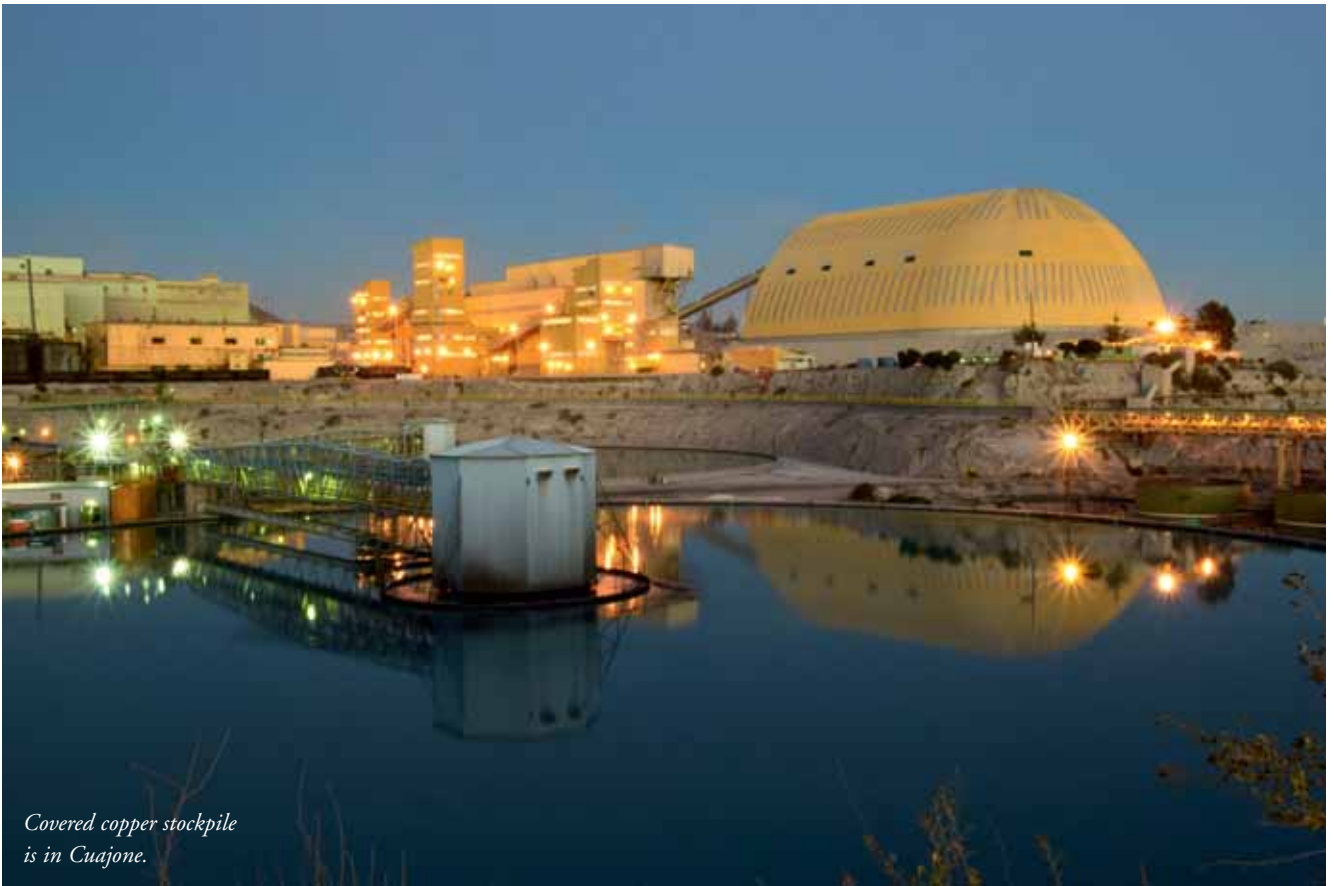
One of MegaDome®'s latest innovations is the AR Series. These permanent buildings bring together the innovative MegaDome® design and all the benefits of conventional buildings. Their vertical walls allow even more storage capacity in height. The structure can be up to 200 feet wide, the steel roof joists are hot dip galvanized, the wall membrane can be replaced with sheet metal and the roof membrane can be changed by sections. This makes it a perfect storage building for important quantities of bulk products.

MegaDome®'s experienced team designs innovative buildings that can adapt perfectly to all bulk storage needs. Every project begins by evaluating requirements and objectives, allowing it to create a personalized client experience. MegaDome works with the client, on the field, at every step. Backed by more than 50 years of experience, it can offer high quality buildings to meet client needs and expectations.



DB series, fertilizer warehouse, Port of Trois-Rivières.

Time flies: Geometrica celebrates 25 sensational years



Covered copper stockpile is in Cuajone.

It's not clear when the saying 'Time flies when you're having fun' first appeared. Its elder sibling, the axiom 'Time flies' goes back at least to the Roman poet Virgil (70–19 BCE).

While 'time flies' is simply a motto about how time is lost, the longer saying is more about how we perceive time when our minds are happily occupied.

This year marks a milestone celebration for Geometrica. The company has provided structures for the dry bulk industry for 25 years. To Geometrica, it seems like it was only yesterday when it installed its first dome.

SIGNATURE PROJECTS

With hundreds of clients and installations across five continents, Geometrica has the experience necessary to deliver creative solutions for industrial applications.

Geometrica has a lot of projects to be proud of. For brevity, here are just a few of its signature projects:

- ❖ At the **JEA power plant** in Jacksonville, two 122m storage domes cover petroleum coke stockpiles near wetlands in northeastern Florida (USA). Both are internally clad to reduce the threat of combustibility.
- ❖ In the southern part of the Peruvian

Andes, at an altitude of approximately 3,500 metres above sea level, a copper stockpile is covered in **Cuajone**. Built while the stockpile was in operation, this impressive structure incorporates three different structure types — a semi-dome encloses one end, the main body has arches and a space frame wall closes the other end.

- ❖ The **Marchwood Silver Dome** is a stunning shoreside icon in Southampton (United Kingdom). It was awarded in 2009 as the 'Best Designed Project' by *Partnerships Bulletin*. The facility conceals and beautifies a waste-to-energy facility.



Covered petcoke stockpiles at the JEA power plant in Jacksonville.



The Freedom at Bocamina II.

❖ The **Freedom at Bocamina II** is one of Geometrica's most challenging and successful projects to date. Located in the coastal town of Coronel (Chile), the Bocamina power station is a thermo-electric power plant operated by Endesa. Covering the coal storage yard was part of an overall initiative to bring the plant's environmental standards to a level amongst the highest in the country, if not the world.

QUALITY MANAGEMENT SYSTEM

Producing quality work is a key priority at Geometrica. The company's ISO 9001, ISO 3834 and EN 1090 accreditations show just how far it will go to ensure the best quality of work for all of its clients worldwide.

When Geometrica first achieved its quality management certifications in 2009, it was very keen to ensure that all of these quality frameworks were used to bring

genuine value to its clients, rather than focusing on accreditation for accreditation's sake. Hours of work and preparation were undertaken, internal policies and processes aligned with standards, employees trained and internal audits completed.

Documenting and improving Geometrica's Quality Management System (QMS) is an intense process but the company considers this to be its greatest on-going accomplishment to date. By using



The Marchwood Silver Dome in Southampton, UK and (inset) during construction.

a Wiki-based website, documentation is developed and improved in a collaborative way. It empowers everyone in the organization.

Geometrica has a QMS centred on the whole organization. It develops a deep corporate culture for continuous improvement and teamwork. The company adapts to change and work fast, efficiently and effectively. Its proven system ensures that every project is delivered with the highest possible quality.

BRIDGE TO CHINA

When you think about emerging markets, you may think first of the People's Republic of China, if only because it's so big. China is the world's workshop. An emerging market success, the country has plenty of room to grow.

However, China's economic miracle has come at a high cost to the land, the air, and the water. The country's rapid economic and infrastructure growth has led to environmental damage and atmospheric pollution. Improving environmental

stewardship is critical.

The country is beginning to fight back with new environmental policies and innovative solutions. And it is good to realize that Geometrica's technology is helping China too.

In 2015, Geometrica signed a breakthrough agreement with Huadian Heavy Industries (HHI). With this agreement, HHI has an exclusive licence to Geometrica's Freedom[®] technology.

This advanced spatial structural technology provides lightweight and long span solutions that contain emissions and reduce environmental pollution. This technology can be used to enclose power plants, coal yards, steel mills, and cargo terminals.

HHI's core market competitiveness is significantly strengthened. And, bare plants and bulk storage yards will soon be under cover across China.



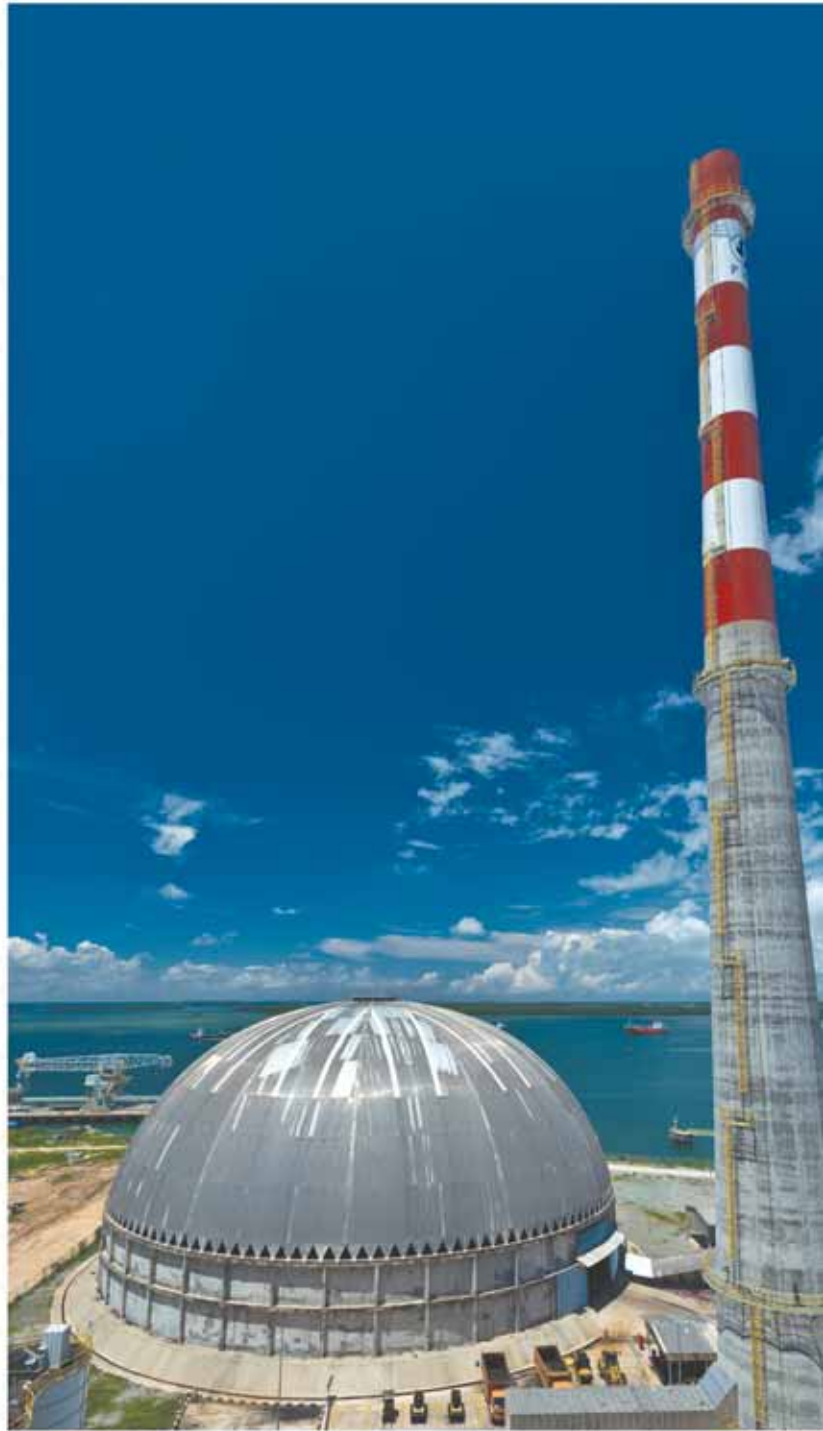
THEN & NOW

If there is one thing that is certain, it is change. A lot of things have changed since the year 1992. Can you believe that 1992 was 25 years ago!?

At Geometrica, time does pass quicker because its employees enjoy what they do. Ports, miners, power producers, and manufacturers have come to know and trust Geometrica for a quarter of a century. So today, Geometrica is pausing to let the past show how far it has really come and to celebrate its silver jubilee.



The breakthrough agreement with Huadian Heavy Industries (HHI) gives HHI an exclusive licence to Geometrica's Freedom[®] technology.



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

Innovative storage: domes provide more storage in less space & overall cost savings

More companies are seeking the benefits of steel-reinforced concrete domes that exceed those found in flat storage or silos, writes Rebecca Long Pyper for Dome Technology. Unique and proven construction methods and materials contribute to a dome's strength and flexibility of use. Here are a few key benefits of a dome for bulk storage:

SPACE REQUIREMENTS AND STORAGE ABILITY

Domes store a large volume in a smaller footprint, stacking product deeper and taking up less property at the site. While some customers require three to five warehouses to store product, one dome will likely accommodate the same amount of material. The double curvature of a dome lends itself to the ability to build up, rather than out, and that curve provides strength at all points of the structure. The entire interior of a dome, then, can be used to contain product, so a dome will hold store more than a silo of similar diameter and height, especially for products with a low angle of repose like cement and fly ash. In essence, the greater quantity a customer wants to store, the more competitively priced a dome will be.

FOUNDATIONS

A dome's strength and geometry provide a tolerance for differential settlement. Those qualities combined with geotechnical engineering and site analysis ensure proper foundation performance. In contrast to a flat storage, the dome is continuously supported by the ring foundation; as a result, some differential settlement doesn't adversely affect the structure. Customers might save millions as the need for deep foundations may be reduced or eliminated based on the ability to accommodate some global and differential settlement.

STRENGTH

The dome is nature's perfectly strong shape, and capitalizing on its geometry yields an unusually strong manmade structure. Once the foundation system is established, a ring beam is constructed at ground level to form the foundation for the dome structure above. Tunnels too are installed as needed for material-handling processes.

The PVC airform, custom sized based on the customers' specifications, is bolted to the ring beam and inflated, forming the exterior dome shape; the fabric will remain in place indefinitely as it becomes the outer waterproofing membrane.



Customers like Ingenio Magdalena, a sugar producer in Guatemala, benefit from ample storage, consistent interior conditions and robust construction by selecting a dome.

With the airform inflated, polyurethane foam insulation is applied to the inside, forming a layer 1.5 to two inches thick. Embedded in the foam are two-inch-square metal plates called stickers with rods attached to their centers. Premat steel reinforcing is tied to these sticker rods, creating a grid across the entire dome surface. This premat reinforcing is embedded in the concrete and provides initial strength to the structure and a substrate to attach the structural reinforcing steel. Concrete is placed using the shotcrete method.

MOISTURE PROTECTION

A dome provides ideal conditions for stored materials requiring a controlled environment. First, the airform surrounding the entire dome prevents water and moisture entrance. Second, the dome's insulated nature reduces heating and cooling of the walls and air inside, preventing condensation from forming on the interior.

FIRE PREVENTION

Domes are less likely to experience fires because the interior is truss- and support-free — the fewer the horizontal surfaces, the fewer places for dust accumulation. Even so, domes storing explosive materials are often built with explosion panels at the apex. These panels are sealed to prevent moisture from entering the structure but are rated to release in an explosion event or when internal air pressure is excessive. When the explosion panel is loosed, the shape of the structure channels energy through the openings, reducing the chance of the dome being compromised should an explosion occur.

The dome is airtight except wherever penetrations are made, aiding in the

containment of inert gases pumped inside to deter fires, and should a fire start, the dome can be sealed off to eliminate additional oxygen from fuelling the flames.

COST SAVINGS

Cost savings result from domes being built with locally available concrete and rebar, reducing transportation costs for materials. The dome's double curvature provides an efficient design, resulting in less construction materials. In addition, the construction process often reduces the overall construction schedule.

Dome Technology has also pioneered the Drive-Thru DomeSilo that allows for direct load-out, where stored product flows through a hopper for direct load-out into the truck or rail. The dome will provide 100% live reclaim utilizing a fully aerated floor. "Dome Technology is providing a full turnkey system, not just the storage bin," said consulting engineer Doug Weber of Engineering System Solutions.

The Drive-Thru DomeSilo can be used as a day bin when built on a small scale, but in actuality "it's more like a drive-thru silo — it can store so much more than a typical steel day bin," Dome Technology sales manager Lane Roberts said. The dome's dimensions will vary by project and customer need; the bin size will likely range from 1,500 to 15,000 tonnes and will work well storing the typical drive-through capacity of 4,000 to 10,000 tonnes. However, by utilizing a fluidized floor system, "you could easily apply this same concept to a 60,000-tonne DomeSilo," Dome Technology CEO Bradley Bateman said. "There is no limit on the storage size for this technology."

Domes are an innovative option for bulk storage, and Dome Technology is conceptualizing new ideas every day. **DCi**



Don't trust the dust

Technologies employed in the combating of dust emissions

Jay Venter

Tailor-made anti-dust coatings for every application

The storage, handling and transshipment of dry bulk raw materials are a few of the many activities that cause fugitive dust — a nuisance around the globe. The dry bulk sector is making a considerable effort in controlling the dust, but there is always room for improvement. When asked for this, only too often suppliers of dust-depressant coatings answer with: “just dose more product!”

However, each customer has a different situation that deserves an unique approach. Instral is willing and able to develop tailor-made solutions to keep the dust in the bulk pile, while taking other important features into consideration.



EXAMPLES OF DUST CONTROL DEVELOPMENTS:

CHALLENGE	SOLUTION	PRODUCT
Coal terminal has neighbours close by where paper pulp carried by the wind ends up on cars.	Treating coal with anti-dust coating after unloading on the conveyor belt.	C-Force® Industry CB
Iron ore pellets (take up moisture during storage and transport)	Applying an anti-dust coating that repels water, but allows water vapour to pass.	C-Force® Industry IPC
Customer stores iron ore that contains traces of clay causing caking and lumping.	Applying an anti-dust hardened layer on the top of the stacks that repels water.	C-Force® Industry I
Temperature at customer site is regularly sub-zero.	Using an anti-dust coating that is liquid right down to $-30\text{ }^{\circ}\text{C}$ ($-22.0\text{ }^{\circ}\text{F}$)	C-Force® Arctic
Customer needs long-term storage in changeable weather conditions.	Using a weather proof anti-dust coating.	C-Force® Industry 2

The C-Force® Industry products from Instral are non-hazardous, do not negatively affect the physical properties of the treated matter, and burn ash-lessly. These unique and innovative dust suppressing additives can be applied easily with nozzle installations, spray cannons and even fog cannons. With these products, it is possible to treat the surface of bulk piles, roads and open stockyards, raw materials on conveyor belts and open train wagons.

For recycling activities, another product line (C-Force® Recycling) was developed. Examples of activities where dust suppression with C-Force® Recycling is successfully being applied are: construction and demolition, wood, paper, glass, plastic, bottom- and fly ash.

A lot of dust is also released during the production and transshipment of fertilizers. For these dry bulk goods, Instral can also offer solutions that, apart from binding

dust, also reduces the caking tendency and the uptake of moisture of the fertilizers. For both recycling as fertilizer activities products are available that are water-soluble for cases where the substrate has to be dissolved or suspended in water at a later stage.

Instral, not shy of a challenge, is always willing to solve a client's dust problems that nobody else seems to want — or is able to — tackle.



VAN AALST

Tailor made ship unloaders in any size

Van Aalst Bulk Handling is a flexible organization directed to assist its customers with tailor made solutions for their loading, unloading and pneumatic conveying projects. Van Aalst Bulk Handling provides design and technical engineering, manufacturing and supply of equipment and installation supervision. The customer can rely on one experienced and reliable source.

Always Interested. Van Aalst Bulk Handling.



**Road mobile ship
unloaders up to
250 tons per hour**



**Bulk handling
equipment for
dusty abrasive
materials like
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Grain handling systems: why use dust suppression in shiploading?

NEUERO specializes in the development of efficient and environment friendly grain loading and unloading equipment.

In the last ten years, the company has perfected its NEUERO shiploader featuring a vertical loading pipe with kick-in, kick-out (KIKO) movements, and dust suppression head (DSH). In the past, NEUERO has delivered many different systems using straight telescoping pipes, also with a rotating shoe to distribute the product under the hatch, and variety of bellows to try and control dust pollution. Although functional, none of these solutions gave the results the company wanted.

Today at NEUERO the company shows that the combination of the KIKO and DSH systems has brought a breakthrough in the control of dust discharge during shiploading. NEUERO offers ship loaders as mobile on rails allowing continuous loading during travelling, and also allowing using docking points. Also at stationary systems the vertical (KIKO) movement brings enormous advantages.

NEUERO offers its clients alternatives that avoid dust and future problems by choosing the KIKO design with DSH loading head, because unfortunately it is not possible to add this as a future upgrade. Higher equipment weight and loads make it almost impossible to solve the dust problem later. It is sometimes a difficult decision to purchase the KIKO and DSH because old designs cost less and return of investment is an important issue. However, it is recommended to not only look for the short-term investment, but

also the long term savings, the company image, and a clean working environment for employees and neighbours.

HEALTH

In today's market in addition to the efficiency of filling a hatch, grain dust pollution must be taken into consideration. In the past people tolerated grain dust — even saying it is organic and will feed the fish. This, however, has changed with a deeper analysis of dust and what it contains. The dust is a consequence of friction of the shell or hull of the grain. The hull may contain many substances that accumulated with the crop process, like chemical protection against plant diseases. Barley dust is very irritating and can cause reactions in skin and breathing. People at operation sites need to wear protective overalls and use oxygen masks to work close to loading to avoid collision of equipment. Extra people are needed to clean spillage.

Additionally, if a neighbouring business makes a claim due to dust pollution, the problem can result in the stoppage of

shiploading operations. The combination of dust and water can also make the work area slick and hazardous to employees.

EQUIPMENT

All equipment that needs refrigeration or filtration and uses atmosphere air will have problems with dust clogging the filters, entering everywhere. Electric and electronic components are also sensitive to dust and can cause malfunction, short circuit or simple dust covering parts can cause overheating.

EFFICIENCY — COST

The strength of the KIKO with DSH is shown at hatch trimming. One operator can travel with the loading pipe along the hatch and fill the gaps with minimal dust generation. Without the dust, he has a view of the equipment and can choose to go close or not, without need for special protection. This saves manpower, which can then be used in other productive activities. The reduced grain speed also reduces the wear in the loading parts, saving maintenance cost.



System with jet slinger. The operator needs oxygen lung mask and helpers to clean spillage.



Dust generation: taking a closer look at your load zone

If a load zone is managed properly, the materials will transfer safely and efficiently. But when a load zone is not set up properly, poor performance can lead to spillage and dust generation, writes *Kevin Fales, Product Manager, BCPs, Flexco.*

An operation's maintenance team may think that spillage (and the resulting manpower and equipment used to remedy it) is simply part of running a conveyor system. The fact is spillage and the resulting dust at the load zone isn't inevitable. Evaluating and optimizing the belt conveyor at load points can do wonders for a belt conveyor system and its productivity.

SPILLAGE AT THE LOAD ZONE

When evaluating the load zone, it is best to start by looking at the belt conveyor receiving the material in the area preceding the load point. For example, one of the primary causes of load-zone spillage is actually a result of poor belt tracking prior to loading.

Mistracking can be a costly and sometimes dangerous problem. If caught early and fixed, a mistracked belt does little damage to the conveyor. However, if unrecognized or ignored, other types of damage can occur. A belt that is constantly hitting a structure damages both the structure and frays the edge of the belt. In extreme cases, the width of the belt can be trimmed by several inches, therefore, reducing the amount of material it can

carry. If a belt mistracks enough, it will spill material off of the topside onto the area around it, which can result in dust generation.

OPTIMIZING THE TRANSFER CHUTE

If a transfer chute is being utilized, the operation is already addressing material spillage and dust suppression to a certain extent. But if the material flow isn't optimal, operators could be losing money from chute spillage, damage to chute liners and the belt, and material degradation.

The success of a transfer can be measured by many things, including the chute systems' ability to transfer the product at the designed rate; loading the receiving conveyor centrally; loading the receiving conveyor at as close as practical to receiving belt speed; containing spillage within the transfer; and minimizing dust generation.

Ensuring that the transfer chute is designed specifically for the operation, with all of these factors in mind, can increase productivity and decrease dust. An optimized transfer chute, combined with an optimized impact area will certainly limit spillage, aid in dust suppression, and discourage belt damage.

SUPPORTING AND SEALING THE LOAD ZONE

Every load zone needs consideration given to selecting the proper support of the belt. In some cases impact idlers are enough, while others may need a true impact bed

to provide the required protection for the belt. Sealing the load zone from escaping dust and spillage will also be a consideration for selecting a belt support solution.

The rest of the load zone is also important to consider because the transfer area often stretches past the actual impact area. This area needs support for settling material and a sturdy area to create a seal so that the skirting can keep the load on the belt.

While idlers are often used, they can allow belt sag, which makes sealing the load quite difficult. And the practice of putting idlers right next to each other to prevent sagging is impractical from a maintenance standpoint. Because of this, the use of slider beds, with rolls in the centre and sealing bars on the top trough, is recommended.

The final, often most important, job of



One of the most important jobs of the load point is to provide a seal that prevents material spillage and controls dust. In this photo, spillage and dust are likely because a proper seal has not been achieved.

Spillage in the load zone can be a very costly problem for an operation.



To seal the load zone properly, the clamping mechanism should be both durable and provide a strong hold. Paired with a belt support system, a proper seal is achieved.



that discourages vibration and drag on the skirt rubber.

This equipment should be paired with a belt support system that allows for proper sealing. This combination is key to less material spillage and dust generation.

LOAD ZONE MANAGEMENT IS ONLY THE BEGINNING

After reviewing all of the elements of load zone management, it is evident that the success of the controlling dust in the load zone is dependent upon many parts of the system. It is for this reason that an evaluation of the entire system will benefit your operation. A few simple changes can increase

the load point is to provide a seal that prevents material spillage and controls dust. The best way to do that is to start

with the proper transfer chute. From there, the clamping mechanism should be both durable and provide a strong hold

efficiency and productivity and decrease the amount of time spent crunching numbers to cut costs.




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Image: LISTENOW Loading System 4030 with fill-level indicator.

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NO DUST!

Presenting the PulsePak® Prime from AAF International

AAF International's PulsePak® Prime pulse-jet cartridge dust collector is designed to meet today's high efficiency and compact size requirements for in-plant recirculation installations. It is ideal for an array of applications where space is limited and dust loadings are too high for typical cartridge collectors. The rugged welded construction allows for standard explosion venting protection and can easily be modified to allow for the addition of a suppression system.

The PulsePak® Prime combines true downflow of the incoming dust-laden air with the unobstructed 'free-fall' of the dislodged dust to the hopper. As a result, the PulsePak® Prime operates with less internal turbulence and therefore, a lower differential pressure than competitive designs.

The unique filter cartridge arrangement provides a more compact design, which allows for maximum flexibility when meeting space requirements. Large hinged access doors allow for minimized inspection and cartridge change-out time since multiple filter cartridges can be externally accessed through one door.

By using a venturi design, the PulsePak® Prime cleans more efficiently. The PulsePak® Prime is equipped with REDClean® Media, allowing it to offer best-in-class filtration. Many different media options are also available.

FEATURES AND BENEFITS

- ❖ REDClean® panel pak allows for great performance especially where dust loadings are high
- ❖ True downflow design for enhanced better dust pre-separation
- ❖ Vertically arranged panel paks and pleat configurations allow unobstructed discharge of dust to hopper
- ❖ Single gasket sealing surface reduces potential for air leakage
- ❖ Compact design and modular construction for ease of installation
- ❖ Front access and the tool-less filter change-out minimizes filter change-out time to keep operations running

The PulsePak® Prime combines true downflow of the incoming dust-laden air with the unobstructed 'free-fall' of the dislodged dust to the hopper.



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Vortex – valves and spouts designed for dry bulk handling & dust control



Vortex loading chutes can be designed for food-grade compliance, high temperatures, or abrasive environments.

COMPANY OVERVIEW

For 40 years, Vortex has specialized in the design and manufacture of components for handling dry bulk solid materials in gravity flow, dense phase, and dilute phase pneumatic applications. Vortex's technical focus is in the development of innovative technologies that compensate for wear, require minimal spare parts, provide easy in-line maintenance, and maintain a longer service life than market alternatives. In turn, Vortex components improve process efficiency, ensure dust-free environments, and establish long-term reliability.

Worldwide, more than 15,000 companies rely on Vortex slide gates, diverter valves, iris diaphragms, and loading chutes. Present in more than 50 countries, the Vortex service network delivers global process solutions and technical support through localized client relationships.

APPLICATION CAPABILITIES

Selecting the right piece of equipment is critical to the success of any bulk handling system. Misapplied components and deficient designs can cause unexpected repairs and process inefficiencies that negatively impact a company's costs and performance. The characteristics of dry bulk materials are endless, so there is no all-encompassing solution for every application. This is why since 1977, Vortex has offered a wide range of valve and spout designs capable of handling thousands of dry materials, including: cement, chemicals,



Vortex diverter valves feature removable blades, replaceable abrasion-resistant liners, and easy access panels to allow in-line inspection, maintenance, repair or replacement.

coal, grain, ores, plastics, rocks, sand, and much more.

If the product is dry, there is a high probability Vortex has handled it.

CUSTOM-MADE SOLUTIONS

Vortex takes great pride in building completely customizable components, in order to best fulfil the processing needs of a customer's specific application. With more than 150 years of combined experience in the dry bulk material handling industry, clients can be assured Vortex engineers will listen to their needs and rely on in-depth knowledge of dry solids to develop the right solution for even the most demanding applications.

Whether it be actuation methods, valve size, or valve construction materials, Vortex offers a wide variety of optional features and customizations to make the market's best components for solving complex processes.

LOADING SOLUTIONS

Vortex Loading Solutions provides fast and steady material flow during the loading and unloading of dry bulk solid materials in open and enclosed vessels, such as trucks, railcars, tankers, ships, barges, or for stockpiling. Vortex loading chutes are ATEX-certified, and are specifically designed to capture fugitive dust, prevent material waste, and ensure plant and environmental safety, with low maintenance and service expenses.

When material is discharged in mass flow, dust becomes airborne due to impact forces, air entrainment and friction between material particles. This is exacerbated by the displacement of air within vessels, which often creates clouds of unmanageable dust in the loading area.

Over the last decade, ever-increasing pressures from occupational health and environmental agencies worldwide have forced operators to find reliable solutions that significantly reduce dust emissions.

In response, the Vortex loading chute is designed to utilize a filtration system. Through a vacuum pull, the Vortex filtration system simultaneously traps dust in filter cartridges as materials continue to flow through the chute. Then, reverse pulse jets purge the collected dust and reintroduce it to the material flow, minimizing dust build-up in filters. This creates a closed loading cycle that retains displaced air and dust, and minimizes material loss.

This feature and several other optional features have been utilized in Vortex loading chutes worldwide to improve loadout speeds, capacities, and workplace safety protocols.

TITAN SERIES

Established in 2011, the Vortex Titan Series features slide gates and diverter valves engineered for heavy-duty material handling applications. This includes the handling of materials that pose excessive abrasion and wear issues, situations that

Vortex slide gates can be installed above a loading chute to shut off or meter the flow of dry bulk materials.



call for extremely large gate or diverter sizes, and applications that warrant additional considerations to allow a valve's success in extremely harsh conditions or environments.

The Vortex Titan Series is intended for abrasive and highly abrasive materials of all particle sizes, from whole grains to metal dusts. All Titan Series components are

ATEX-certified, and can be built from a variety of valve construction materials and optional features to make the valve more durable when exposed to continuous abrasion.

QUANTUM SERIES

The traditional line of Vortex components, the Quantum Series features slide gates

and diverter valves that have been used for decades to shut off, meter and divert the flow of dry bulk material.

The Vortex Quantum Series is intended for non-abrasive to minimally-abrasive powders, pellets and granules.

All Quantum Series components are ATEX-certified, and can be design for food-grade compliance.

Wuvio deals with dust.

Deal with dust and clean up your operations. Our easy to use solutions help you create a healthy workplace, keep your neighbours happy and save you money.

Wuvio foam, crust and humidifying agents combat and reduce dust during transport, processing and storage of dry bulk goods.

Want to know more? Call +31 174 520 001

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We all need to deal with dust

Dry bulk cargo shipping and global trade is vital to many industries; the estimated 500 million tonnes of dry bulk material support everything from steelmaking to the beer you crack open at the end of the week.

Loading and discharging bulk cargo or dry bulk from vessels is a specialized task often done by stevedoring companies and designated terminals.

Most dry bulk materials are dusty and therefore a likely source of wind-borne dust emissions. When large volumes of material are being discharged from vessels and allowed to freefall in open air conditions, even a distance of 75cm or less, the increase of speed of the material will displace air and create air turbulence. Causing dust particles to become airborne, therefore dust nuisance can occur even during calm weather conditions.

When the material travels on site, either manually or by conveyor belts from the hopper or feeder to the stacker and ultimately when building the stockpiles, it becomes vulnerable to mass loss by wind. This is especially true during long term storage.

Crust forming is a way to seal stockpiles and forms a transparent or clearly visible white or green layer on dust emitting goods in storage such as coal, petcoke, iron ore, sand, waste, phosphate ore or woodchips.

Wuvio's solutions are able to control dust for the short and long term and allow for optimal flexibility. The stability of the crust is unaffected by harsh weather conditions making it more effective compared to latex or cellulose pulp-based products.

WUVIO SOLUTION

- ❖ The crust lasts anywhere from one to 90 days and application ratios can be adapted to match the customer's site throughput and turnaround times.
- ❖ Crust is unaffected by harsh weather conditions such as strong winds, heavy rain, hail or snow.
- ❖ Visual effect (green or white) enables easy application and visibility.

ADVANTAGES

- ❖ More than 90% dust reduction.
- ❖ Save more than 80% on water (costs and treatment expenses).
- ❖ Loss of product during storage or transport reduced by 90%.
- ❖ 100% biodegradable.
- ❖ 100% safe for people and environment.

DEVELOPMENTS

One of Wuvio's clients recently challenged



Eco-Crust Stockpile sealer white

it to test its crust solution with a range of very fine, almost powder-like, iron ores such as Moirana, Carajas and Tubarao. When loading, unloading and stored in stockpiles even very low windspeeds make these types of material become airborne, causing dust issues. When closely looking at the stockpile, small streams of material can actually be observed floating down.

Wuvio's Freko-Bind stockpile sealer has produced great results on these fine ores which are especially difficult to treat as they have a very high surface tension and hardly absorb water.

EQUIPMENT AND TOTAL SOLUTIONS

Wuvio's focus is to provide a fully integrated solution which is built rugged enough to withstand the harsh environments. The key is to have the equipment which works for each customer — Wuvio's spraying solutions are integrated with system automation to work in conjunction with the production line.

Wuvio offers a variety of spraying equipment:

- ❖ PTO-driven and generator powered spraying cannons which can be used for spraying stockpiles — various tank sizes.
- ❖ Autonomous working and tractor pulled spraying cannons.
- ❖ Automated foam dosing units.
- ❖ Full range of automated mixing solutions to enable accurate dosing from 0.01 to 10% including buffer tanks and silos.
- ❖ Full range of spray bars and atomizing systems for various applications.



Freko-Foam inline treatment

Next to this Wuvio has close co-operations with local equipment manufacturers and integrators in all regions to enable worldwide coverage and service levels. Together with these partners, Wuvio offers turnkey solutions including local technical support and spare parts.

ABOUT WUVIO

Wuvio is a Dutch-based high tech company established in 2007 with a single mission "a clean and healthy environment for all". Integrity, accountability and confidentiality are key pillars of the company.

The company's team of experts is there to help. The company analyses dust problems on site together with its clients and works towards an optimized and sustainable solution, both from an economical and operational perspective.

The company uses innovative proprietary additives, developed in-house, to combat dust. Various techniques can be used to either suppress or control dust. Wuvio's foaming, crust forming, agglomerating and moistening additives are used to reduce mass loss, lower (or maintain) moisture levels and lower water consumption. Its solutions offer improvements on three levels:

- ❖ Improved work environment and a happier workforce.
- ❖ Happier surrounding and better relations with direct neighbours.
- ❖ Improved economics by avoiding mass losses, reduced water usage and lower cleaning costs.



Eco-Crust stockpile sealer green.

Dustcruster®: the solution to dust problems

Den Bakker Dustcrusting technology b.v., (dbd global) specializes in dust control and prevention. The company originally started in 1948 and is now successfully active with Dustcruster® technology on many a site and all over the world.

Den Bakker Dustcrusting technology b.v. specializes in the control of dust, not only by cleaning areas that are already dusty, but also, and most importantly, by preventing dust from becoming a problem in the first place.

Being heavily involved in this matter as a contractor for some 30 years, the company has developed several solutions to help with dust control and prevention, including a range of specially designed spraying vehicles, each having particular capacities and performances to suit the needs of a specific site or condition.

The constant desire to improve led to the development of a very effective method to control dust, far better than continuously spraying — and wasting — pure water: the Dustcruster® technology.

SOLUTION

DBD global has a solution for tackling dust problems commonly connected to storage and handling of large stockpiles of coal, coke, petcoke, iron ore and similar commodities.

The product is called Dustcruster dry® and consists of a selected blend of several types of cellulose fibres pressed into pellets. The advantage of using pellets instead of ready-mixing product is that it can easily and cost effectively be transported and stored as dry bulk or in FIBCs (big bags) to the actual site where it is needed.

Once on site, Dustcruster dry® can then be dissolved into the sprayable product and transforms into Dustcruster liquid® by adding water and using dbd global's special mixing installation.

Next step is to spray Dustcruster liquid® employing purpose made spraying trucks to cover the coal or iron ore stockpiles, hence creating a tough and long-lasting and clearly visible white crust which will last for a long time, even in tough atmospheric conditions

One FIBC contains approx. 800kg of Dustcruster dry® which, once blended with the required amount of water, translates into 3,200 litres of Dustcruster liquid®. Maximum effective solution is three litres Dustcruster liquid® per m² for crusting petcoke, but for crusting less dusty materials the company recommends only



Picture after very heavy rainfall (more than 100mm in one night).

two litres per m².

As mentioned, the purpose built spraying trucks are required to successfully cover the coal/iron ore stockpiles creating a tough and long-lasting and visible crust.

Dustcruster® is an inexpensive and environmentally friendly and natural product, not requiring special precautions to store or use and not affecting fauna or flora.

Normal rain does not affect its effectiveness whatsoever. Even with very heavy rainfall (that is more than 100mm in one night) there is still a tough and long lasting crust of Dustcruster®.

Only after digging or disrupting the stockpiles is it necessary to repair the crust by spraying on a new layer at the clearly visible disrupted area.

Dustcruster liquid® is also used in near zero temperature conditions. In these circumstances, electric heaters are installed in the mixing tank to allow the spraying process to be performed in winter conditions.

The company sells and rents the mixing containers, depending on geographical location and need.

For the spraying of Dustcruster liquid® the purpose made spraying trucks are



The DBD global Demo team is always ready to perform a live demo.

required, mostly agri-tractor towed.

IT IS CLEARLY VISIBLE

A major feature of Dustcruster® is the fact that it is clearly visible. It is white so it can be seen miles away.

Environmental Inspectors are able to easily judge the efforts a terminal has undertaken.

DBD GLOBAL DUSTCRUSTING DEMO TEAM

DBD global has a team, always at the ready to come over to prospective customers' sites, with everything required to perform a live demo on the stacks of their choice.

For this purpose dbd global has two options and will select either the fully autonomous system, which it brings on its



Not the Swiss Alps in winter time, but a major bulk terminal in a seaport in Western Europe in the summer time.

Wagoncruster®



semi-trailer lowloader, or, for overseas destinations, the company can despatch its containerized kit.

In both cases the demo is performed by its specialized team.

WAGONCRUSTER®: CONTROLLING DUST COAL TRAINS

Dust creation during transport of coal and similar products by train is also a matter of concern.

Using Dustcruster® at the loading station solves this problem. The crust safeguards the dust particles from being lifted by the wind during transport. This automatic system which is called Wagoncruster® was developed as far back as in 2007 and is still successfully used to full satisfaction of the customers, without interference of the filling process.

CONTROLLING DUST WITH FOAM DBD FO 312®

With some dust prone products it is not



With foam dbd FO 312®

appropriate to use water as this may affect the product quality or hurt the further processing. For such applications, dbd FO 312® was created.

In a special foam generator, with 2 litres of dbd FO 312® and 98 litres of water a staggering 5,000 litres of foam is created.

Foam, having a larger surface will envelop around the dust particles more easily and keep the area free of dust.

Depending on the actual activities performed the foam can last anything from three to 12 days.

An additional benefit is that huge savings on water is achieved.

COMPETITIVE PRODUCTS

Typical products proposed by other companies are polymer based, but most of The customers of DBD Global, after first having tried the polymer products and then trying Dustcruster® are sufficiently satisfied to continue using Dustcruster® exclusively.



Without foam dbd FO 312®

Several comparative tests have shown that Dustcruster® contains the dust, is long-lasting, clearly visible, environmentally friendly and price worthy.

EXTENSIVE EXPERIENCE

Den Bakker Dustcrusting technology b.v. has gained vast experience in the control of outdoor dust. The company uses very advanced systems, stationary as well as mobile, which can operate under the most severe conditions. Frost and strong winds present no problems for the company's equipment.

Den Bakker Dustcrusting technology knows that each environmental problem needs its own approach and solution, and it enjoys the challenge of developing appropriate solutions for its customers, round the clock, seven days a week.

This commitment is fuelled by the company's belief that there is a solution to each and every dust problem. **DC:**

DUST!

The headache of each terminal operator!

We have the solution:

Dustcruster®!

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World's population and therefore the demand for food is increasing. Every year, millions of tons of grain are collected, stored and handled around the globe – and the upward trend is unbroken. Only the most up-to-date plant and equipment can guarantee rapidity and quality while minimizing raw material losses.

In order to meet the increasingly stringent challenges, Bühler Grain Logistics provides with its capabilities the best possible solutions – for conveying, cleaning, drying, storing, dedusting or loading and unloading the most important commodity on earth. Our contribution to feed the world - together with you!

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