DCi DRY CARGO international

ISSUE NO. 202 MAY 2017

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ISSN 1466-3643

MAY 2017 issue

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Stability returning to coal trade?

Evidence pointing to firmer support for commodity import demand in a number of countries has been emerging. Could this indicate that prospects for growth in world seaborne dry bulk trade are improving? A stronger trend seems quite possible, but there are major uncertainties including coal trade's performance.

The global economic growth background is brightening, according to the IMF's latest (mid-April) quarterly assessment. Only a small 0.1 percentage point upgrade in forecast global GDP growth has been made, to 3.5% in 2017 (after a sluggish 3.1% last year). But the change is significant after a long period of downgrades, and is based on signs of strengthening manufacturing and capital investment spending which could benefit trade.

Coal

Recent estimates by a reputable forecaster suggest that global coal trade will decline again this year, decreasing by about 2% from the volume seen in the previous twelve months. But it is arguable that expectations of another negative annual result now seem less convincing than previously. Some adverse influences appear to be receding, at least temporarily.

According to updated forecasts by the Australian Government Department of Industry, Innovation and Science, world trade in steam coal (including land movements, but mostly seaborne) could decline by 20mt (million tonnes) or 2% in 2017, to 1016mt. Metallurgical coal trade, similarly, may be 6mt (2%) lower at 309mt. Reduced imports of both coal types into China are seen as a key contributory factor.

Iron ore

Steel demand prospects for the year ahead, in steel producing countries which are key raw materials importers. are mixed. The main boost for global iron ore trade is still China's rising imports, which totalled 271mt in the first quarter of 2017, a 12% increase from last year's same period. Higher steel output and further substitution of Chinese domestic iron ore were instrumental.

New predictions of steel demand, based on finished steel products, by the World Steel Association show Japan's growth at just over 1% this year, following a decrease of similar magnitude in the past twelve months. In the European Union a 0.5% rise expected in 2017 is slower than last year's 2.3% increase. China could see a flat outcome this year after growing by 1% last year.

Grain

The new 2017/18 crop year starting July is becoming a greater focus of attention in the grain sector. An early forecast by the International Grains Council suggests that global trade in wheat, plus corn and other coarse grains may total 340mt, a volume almost unchanged from the 342mt estimated for the present year.

However, possible changes in some of the key influences are still unclear. Import demand changes will partly reflect summer domestic harvests in northern hemisphere importing countries. Weather conditions determining these crops in the remainder of the growing season are still unpredictable. However, one negative aspect may persist: excessive corn stocks in China may restrain grain imports.

Minor bulks

Among minor bulk commodity movements, agricultural and related cargoes are prominent. Oilseeds and meals trade, estimated at around 105mt annually appears to be rising, boosted by increasing soyameal flows. Fertilizer trade is also sizeable at about 150mt annually but apparently has been fairly flat in the past few years.

Bulk carrier fleet

About two-fifths of the entire world bulk carrier fleet is comprised of Capesize (100,000dwt and larger) vessels, mostly employed in the iron ore and coal trades, the biggest fleet segment. In 2017 Capesize tonnage growth is again estimated at under 2%, as shown by table 2 below. Newbuilding deliveries are set to fall sharply this year to a much lower level than seen in preceding years, but scrapping also may diminish, resulting in a limited change in net deadweight capacity added.

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

	2012	2013	2014	2015	2016	2017*
Japan	113.7	114.5	114.2	120.1	115.8	115.0
South Korea	98.9	100.1	100.8	102.6	102.5	104.0
Taiwan	55.2	57.1	57.0	56.3	55.0	56.0
China	181.5	192.0	165.5	107.9	124.2	130.0
India	123.4	144.1	176.0	171.0	149.2	145.0
Total of above	**572.7**	**607.8**	**613.5**	**557.9**	**546.7**	**550.0**

source: various & BSA estimates **BSA forecast*

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

	2012	2013	2014	2015	2016	2017*
Newbuilding deliveries	41.9	22.0	18.5	16.9	20.0	13.0
Scrapping (sales)	11.7	7.9	4.2	15.4	13.3	8.0
Losses	0.0	0.2	0.0	0.0	0.2	0.3
Plus/minus adjustments	–0.2	0.1	0.0	–0.4	–0.5	0.0
Fleet at end of year	**279.8**	**293.8**	**308.1**	**309.2**	**315.2**	**319.9**
% change from previous year-end	+12.0	+5.0	+4.9	+0.4	+1.9	+1.5

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

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Resurgent grain and soya exports from South America

Grain and soya exports from South America are set to surge upwards this year, after a setback over the previous twelve months. The 2017 total could be about one quarter higher, approaching 190mt (million tonnes), based on recent forecasts. If that volume is achieved, it will comprise about a third of world trade in these cargoes.

Soyabeans and meal exports from Brazil and Argentina are the largest part, possibly totalling about 120mt. The balance is mostly corn, plus some wheat and other grain types. During the past decade, growth in South America's exports has been remarkably strong, although annual changes have varied greatly.

A guide to changes unfolding is shown in the table below, summarizing forecasts prepared recently. As demonstrated dramatically last year, however, expectations sometimes change as the season progresses. Estimates for harvests now under way in South America, and calculations for export sales may be revised. Moreover global import demand, and amounts supplied by competitors in other countries, is subject to constant review.

Promising prospects

This year's total grain and soya exports volume from Brazil and Argentina may be much higher, by an estimated 24%. Figures derived from US Dept of Agriculture data suggest that an overall 36mt increase could be seen, representing a recovery after a 21mt or 12% reduction last year to 154mt.

Several separate USDA forecasts published in the middle of last month have been used for these calculations. Marketing year periods for cereals and oilseeds exports differ, and so the calculated total is not as precise as it appears. The marketing periods differ mainly because harvest timing varies.

The result is a broad indicator of what can be foreseen, based on current information. Illustrating how circumstances can change, twelve months ago a marginal 1% decrease was expected in 2016, but the downturn proved far larger.

Jumping grain exports

Exports of wheat plus corn and other coarse grains from South America appear set to resume an upwards trend this year. Following last year's large reduction, a 23mt or 50% rise to just over 70mt is predicted, benefiting in particular from the impact of abundant rainfall on Brazil's corn crops.

Argentina's wheat harvest starts the annual crop production cycle in South America. In the latest harvest completed several months ago output was higher then seen twelve months earlier, at 16mt, reflecting a bigger crop area and good yield. As a result, exports in the marketing year ending November 2017 are expected to increase by 5% to 10.1mt.

Production of corn and sorghum in Argentina this year is now approaching completion and is estimated to total 42mt, about 30% above the previous harvest. The corn crop area has expanded. Exports in the marketing year ending February 2018 could rise by 21% to 27mt.

Corn exports from Brazil have become a prominent feature of world grain trade in recent years but in 2016 there was a severe downturn. Production fell because of adverse effects from dry weather. This year corn production from two separate crops is expected to recover strongly, boosted by good weather, rising by 40% to 94mt. Exports in the year ending March 2018 could reach 32mt, based on USDA estimates, more than double those of the preceding twelve months.

Buoyant soyabeans and meal exports

Soyabeans and meal sales from South America to a wide range of foreign buyers could strengthen this year, after declining in the preceding period. Exports during 2017 are estimated at almost 120mt, a 13mt (12%) increase. Global import demand continues to expand solidly, although Brazil and Argentina face competition from other suppliers, principally the USA, in many markets.

Brazil's soyabeans output in the current harvest looks set to increase by 15% from last year, exceeding the symbolic one hundred million level, to reach 111mt. Further growth in the area under cultivation and good yields have assisted. Beans and meal exports in marketing year 2017/18 ending January could rise by 18% to 79mt, based on USDA's estimates.

In Argentina, soyabeans production in the current harvest seems likely to remain almost flat at 56mt amid a slightly lower crop area. Beans and meal exports during the marketing year ending March 2018 could be about 2% higher at 41mt.

Import demand looks sturdy

South America's export sales reflect several influences. Grain and soyabeans output in the latest harvests is crucial, while stock levels also have an impact. Competition from other suppliers is relevant. Ultimately, consumption trends and the extent of reliance on foreign supplies in importing countries determines the outcome.

Among importers, changes are visible. There are signs of reduced import demand, in the wheat and coarse grains sector, in China and the European Union. Excessive corn stocks are holding back imports in China, as the government seeks to reduce inventories. Forthcoming domestic harvests in importing countries in mid-2017, if these rise or fall substantially, may alter the outlook.

Within the soyabeans and meal sector import changes are mainly positive. In the dominant importing country, China, which relies on imports for most of its supplies, a rising trend is still evident, reflecting strengthening soyameal and oil usage. In other countries import trends mostly seem positive. *Richard Scott*

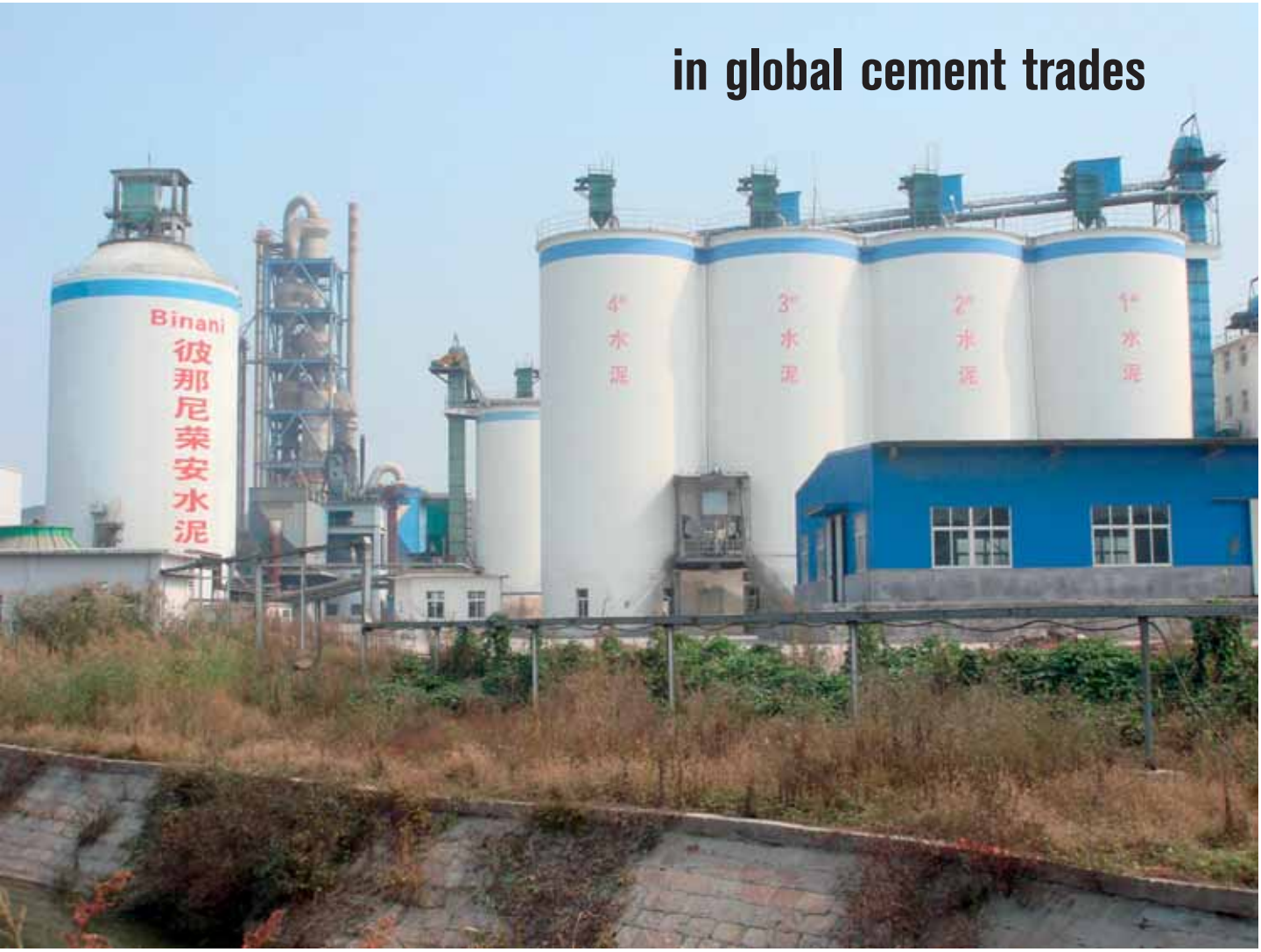
SOUTH AMERICAN GRAIN AND SOYA EXPORTS (MILLION TONNES)

Argentina and Brazil — wheat, corn, sorghum, soyabeans, soyameal (varying marketing years - see text)

	2012	2013	2014	2015	2016*	2017*
Wheat	14.9	5.2	2.4	7.0	10.7	11.5
Corn and sorghum	44.5	45.5	39.4	54.3	36.3	58.9
Soyabeans	38.0	50.7	53.2	66.3	61.1	72.6
Soyameal	35.8	37.6	41.2	47.0	45.6	46.9
Total	**133.2**	**139.0**	**136.2**	**174.6**	**153.7**	**189.9**
% change from previous year	+7.0	+4.1	-2.0	+28.3	-12.0	+23.6

source: US Dept of Agriculture (11 April 2017) & Bulk Shipping Analysis ** USDA forecast for 2017*

China leads the way in global cement trades



China outpaces India in terms of capacity, production and use

In terms of capacity, production and consumption, the Indian cement industry is next only to China's, *writes Kunal Bose*. But in every respect — from capacity to production and use of cement — China, where the pace of infrastructure development and urbanization in the past two-and-a-half decades took the world by surprise, is many times bigger than India. According to the *International Cement Review* and other research agencies, India's cement production in 2015/16 was 285mt (million tonnes) compared with 2,483mt in its northern neighbour. Similarly, in consumption of the binding material China with 2,511mt is miles ahead of 280mt in India. It then is obvious that in cement making capacity too, China will remain manifold ahead of India.

If size is the differentiator of the industry obtaining in the two major economies, cement is travelling an identical path in both places by way of scrapping of energy inefficient and high cost capacity and accelerated capacity consolidation. Like in sectors like steel, aluminium and coal, after a period of explosive capacity growth leading to oversupply and low and in many cases negative margins for producers, the Chinese cement industry is now entering a critical phase of structural adjustment. Burdened with much surplus capacity, a portion of which must be eliminated on environmental consideration and to cut losses exacerbated by low domestic prices, the cement industry in China has rapidly become the world's largest exporter. But future of export sales will be decided by the speed at which industry restructuring is done.

Surplus capacity and export thrust by China are viewed with concern by India and for the right reasons. LafargeHolcim subsidiary in India Ambuja Cements, which with capacity of 63mt, including capacity of its subsidiary ACC is counted among industry leaders with pan-India presence, says no customs duty on cement in the country remains an area of concern for local manufacturers, since this is an "incentive to import." The Indian industry too is nursing considerable surplus capacity and imports will further aggravate "demand and supply mismatch."

At this point, surplus cement capacity in India is in excess of 90mt. The history of Indian cement industry since its delicensing in 1991 shows periodic occurrences of surplus capacity with expansions materializing in bunches. Demand growth in subsequent years would mostly absorb the new capacity. Delicensing was the inflexion point for the industry. Local industry houses first took advantage of the liberalization to start

investing heavily in building new energy efficient cement plants. The seeds of today's very successful cement groups such as Ultratech Cement, Shree Cement, India Cements and Ramco Cements were sown in post-delicensing days.

Arguably, the most successful cement company created by first generation industrialist trio Narottam Sekhsaria, Suresh Neotia and Vinod Neotia taking advantage of policy liberalization was Gujarat Ambuja, which was acquired by Holcim in 2006. The name of the company was since changed to Ambuja Cements following change of hands. Ahead of the merger of Lafarge and Holcim, the former had a fairly large manufacturing presence in India. Observers say post-merger consolidation of assets under Ambuja, ACC and Lafarge, which was required to sell some capacity following the merger has given a pole position to LafargeHolcim in India.

The merged entity is present in 80 countries with installed capacity of nearly 355mt. "India is jewel in the crown of LafargeHolcim in terms of capacity size, contemporary technology and profitability," says an official of the Cement Manufacturers Association. For cement manufacturers globally, India is a market of "unfolding opportunities." No wonder then, HeidelbergCement of Germany is present here with capacity of 5.3mt with its brand 'mycem' fast gaining in popularity in central and southern India. The company's presence in India got considerably strengthened when in July 2016 it acquired the majority holding of Italcementi from Italmobiliare. Italcementi set its foot in India in 2001 and went on both acquiring and building capacity through brownfield route.

The Dublin headquartered leading international building materials group CRH plc is too making steady progress in cement capacity acquisition in India since 2008 when it bought 50% of Andhra Pradesh based My Home Industries Limited and formed a joint venture with MHIL. The two plants of MHIL have capacity of 4.8mt with claim to be among the lowest cost producer of cement in south India. Then in August 2013, it acquired full ownership of Sree Jayajothi Cements with capacity of 3.2mt.

In cement capacity consolidation in India, foreign groups, which in some cases had gone through path breaking mergers and acquisitions among themselves, have remained in the forefront. But some local cement companies, UltraTech Cement in particular saw it early that it has to combine acquisition with new capacity building, particularly through expansion of operating plants to play a leadership role in the industry. UltraTech with capacity of 57mt is the second largest cement group in India next to LafargeHolcim. An ascending entity to watch will be JSW Cement, part of an $11bn group which is working to lift capacity from 7mt to 17mt by April 2018. JSW has entered into a joint venture with Wagners to "launch and promote earth-friendly concrete in India." In the JV, JSW and Wagners are having holding in the ratio of 74:26. The Indian company is also building a 1mt plant at Fujairah in the United Arab Emirates.

Because of large capacity overhang, the industry focus in the next few years will be turn more sharply on consolidation. ACC becoming a subsidiary of Ambuja Cements is a kind of natural progression since both are majority owned by LafargeHolcim. But UltraTech buying Jaypee Group's 17.2mt cement business last year and JSW Cement buying the entire promoter holding of Orissa based Shiva Cement to be expanded 2.4mt show continuing progress in industry capacity consolidation. Indian business groups, which in the past diversified into cement but which has not become part of their core activity, are open to divesting their cement interest. Tata Steel, Raymond and Larsen & Toubro had in the past exited cement business getting good returns on their investments. "Valuation of cement businesses coming for sale has shot up. But cement companies, standalone or part of diversified groups, which have big debts on their books and are not able to service loans are coming under increasing pressure from banks to sell assets. So going forward expect producers with capacity ranging from 1mt to 5mt exiting the business," says an industry official. The units with ownership of good limestone deposits and coal linkages will always command good valuation.

Cement demand rise in India where the government is laying maximum emphasis on infrastructure development and providing housing for all should be higher than GDP growth rate. This was the case with China over many years of breathtaking infrastructure and construction activities. India's cement demand growth in the first half of 2016 was a robust 8.5% on a year-on-year basis. But then heavy rains during the last southwest monsoon and the subsequent demonetization of two high value notes in early November "pulling back construction cycle" took a toll of cement demand in the second half. Leaving the industry

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with high idle capacity, cement demand grew only 5% in 2016. Industry officials are drawing comfort from the government announcement of spending $1.5 trillion in infrastructure development in the next ten years since that should generate much incremental demand for the binding material. "Cement will be much in use if the government sticks to the target of housing for all by 2022, goes for cement concrete roads in a big way and build 100 smart cities," says independent analyst Ganapathy Srinivasan.

What has foodgrain production got to do with cement use in the country? According to industry officials, "quite a lot." Empirical evidences are there whenever farm production either stagnates or takes a dip, farmers will postpone construction or extension of residential houses and storehouses using cement and steel to better times. The 2016/17 Indian farm season (July to June) heralds a change in fortunes of farmers when, according to the second government estimate, foodgrain production will climb to an all-time high of 272mt. It will be recalled that India went through two back to back deficit monsoon years immediately before the current season when yearly food grain production was a little over 250mt.

Farm prospects for the next season remain favourable when the likelihood of a normal monsoon should further lift foodgrain production to 274mt. Improvement in income resulting from bumper production and good times ahead will lead farmers to start new construction. Similarly, for safe storage of foodgrains, large numbers of silos are required to be built across the country. Even while India is moving apace to join the ranks of developed countries, the country offers the unedifying sight of freshly harvested crops being left in the open with tarpaulin or PVC sheet covering. Moreover, small farmers in general make do with storage structures with locally available materials, which are neither rodent proof nor secure from fungal and insect attacks. No wonder the FAO says in a study report that India loses on an average 10% of its foodgrains production every year. Cement use stands to gain much if the government at central and state levels initiates moves for large scale building of community storages and silos.

Marked improvement in the working of cement companies in the quarter ended March shows demand rise for the commodity in rural and semi-urban areas on the back of spurt in income of people engaged in the farm sector and the government actually rolling out major infrastructure projects, particularly highways. The trend is likely to be sustained as the realization is there that infrastructure that is now available, if not adequately strengthened, will stand in the way of further major investments. For a country like India where infrastructure spending is tuned to grow rapidly, cement demand growth should be one or two percentage points more than GDP growth rate. This has been the case with China for a long time. Even in the last couple of years when the Chinese leaders decided that the country needed to move from investment and export led growth to a model powered by consumption leading to slowing down of economic growth, Beijing felt the need to provide stimulus to house building and construction, benefiting cement and steel in particular.

In the whole of 1990s and also in the first decade of the new millennium, cement production and consumption in China grew at a higher rate than per capita GDP's progress. Starting 2011, *per capita* GDP growth overtook that of cement. According to China National Bureau of Statistics, the country's cement production in 2015 was down 4.9% to 2.35bn tonnes. As the property sector gained some momentum in 2016 helped by interest rate cuts, cement output rose 2.5% to 2.4bn tonnes last year. The day of reckoning for the Chinese cement has arrived as President Xi Jinping has come down heavily on major industries such as coal, steel and cement to phase out polluting units stuck with energy inefficient old technologies. Restrictions have been put on cement production during the winter as a pollution control move.

India which, like China, is a signatory to the Paris Agreement on climate change remains watchful about cement factory emissions. Over the past decade, cement units in India have taken steps, including economizing of power use through improvements in operational efficiency and optimization of fuels mix and waste heat recovery system. For an efficient producer of cement, power and fuel account for about 22% of total costs. The mantra for the industry then is less the use of power to make a unit of cement, the better it is for the environment. An industry official says cost efficiency of cement plants in India will improve if logistics cost now constituting about 29% of total expenses is reduced substantially by improving rail movement in particular. With demand outlook improving, the Indian cement industry will continue to grow in capacity helped principally by local availability in abundance of the required two principal raw materials limestone and coal. To facilitate capacity growth, the government will have to be expeditious in organizing auctions of existing and newly explored limestone deposits and coal linkages. The country's new exploration policy encouraging participation by private domestic and foreign companies in prospecting and exploring mineral deposits, including limestone bodes well for the cement industry.

Brazil needs sustained economic growth to boost sluggish cement market

There is little sign of an upturn in demand for cement in Brazil, where huge numbers of unsold houses and offices remain a drag on the market, *writes Patrick Knight.*

Few, if any sectors of the Brazilian economy have been hit as hard in the past four years of deep recession, as the country's cement industry. A decade of steady growth, stimulated in the main by a boom in the construction and repair of housing, which is responsible for close to 70% of industry's sales, came to an end three years ago. For several years, the number of homes being built each year grew far faster than the number sold, causing stocks to increase. Coupled with a fast growth in unemployment, and a squeeze on credit, which has forced many thousands of home owners to sell, or to fail to complete purchase of houses they had ordered, house building has now come to an almost complete halt. So many unsold and partly completed houses, as well as offices, now hang over the market, that it is anticipated that a further three or four years of economic growth, which is only now showing signs of beginning, will be needed before demand for new premises perks up again.

Encouraged by the growth in consumerism of the past 10–15 years — a phenomenon brought about by an easing of credit, rises in wages and pensions, and increases in both employment and spending — many millions who were previously unable to buy their own home, began to do so. To meet the extra demand, the cement industry embarked on a massive investment programme. Many large new mills were built, several of them in parts of the country where growth had previously been lower than average. Many more mills were expanded. The result was

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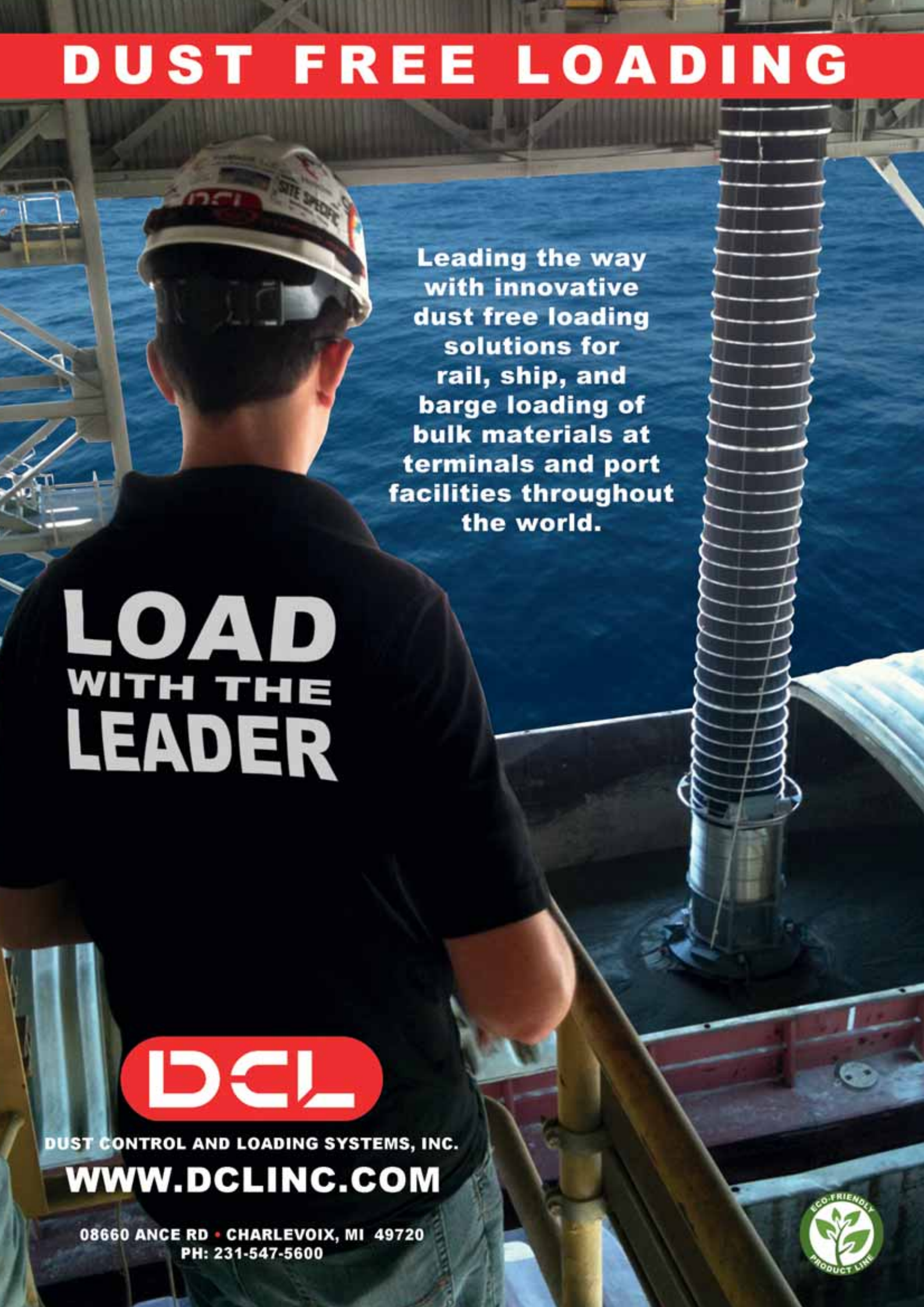
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that cement making capacity increased from about 50mt (million tonnes) a year a decade ago, to close to 100mt at the last count. The industry leader is the Votorantim company, which has 27 mills, scattered all over the huge country, which is larger than the whole of Europe. In second place is Intercement owned by the Camargo Correa construction company, which has 16 mills, and in third place, is the Joao Santos company, which has 11 mills.

Most of the Santos plants, which operate under the Nassau name, are concentrated in the north east of the country, which has been growing at a faster rate than the country as a whole in the past few years. The recently merged Lafarge/Holcim group is in fourth place, and now operates nine plants, many of these more modern and larger than those of the older established companies. The industry as a whole is formed of 23 companies, ten of them large. One leading steel company, the CSN group, is a significant player, and it makes use of industry waste as a raw material.

Although the industry was undoubtedly worried by its growing dependence on new housing, which has been almost entirely the responsibility of the private sector, growth has often been backed with some financial backing from a government anxious to see the stock of low cost accessible housing increase as well. But the industry was also very well aware that, at some point, Brazil would have to greatly increase spending on infrastructure of all types. Exports, particularly of commodities, have increased greatly in recent years, as have imports. This has put increased pressure on the network of elderly roads and on outdated railways and ports, as well as airports. These are being increasingly used by a new generation of those wanting to travel around Brazil by plane, rather than spend up to three days in long distance coaches, as used to be the only option.

There has always been a substantial sale of cement in bags bought by millions of the less well off, many of which either built small simple homes themselves from scratch, or extended existing ones. This is usually done to accommodate other members of growing families, who would contribute with labour, if not with funds. But the sudden shrinkage in employment both in the construction industry itself, as well as numerous other industries, notably the motor and most consumer durable industries, has resulted in many people losing their jobs, forcing many to cut back on spending. Many people are having great difficulty in keeping pace with paying back debts they assumed when prospects were better.

The years of recession have also reduced the flow of taxes at all levels, federal and local. This means the government has less to spend. Many local councils, an important source of patronage and spending, are also facing severe financial hardship. Both central and local government have been forced to cut back on spending of all types, both of wages and capital, a process which has still not run its course.

SALES OF CEMENT, MILLION TONNES

2017	50 (estimate)
2016	55
2015	65.2
2014	71.2
2013	70.2
2012	68.9

Source: Cement Industry Association.

Although Brazil's two largest cement companies, Votorantim and Intercement, have subsidiary companies in numerous other countries, both in Brazil's neighbours, large ones such as Argentina, and smaller ones, such as neighbouring Bolivia, Uruguay and Paraguay, only relatively small quantities of the cement made in Brazil has normally been exported. Only very rarely, at times of exceptionally peaks in demand, has Brazil imported any cement either. The usually very profitable Votorantim company is also a market leader in the aluminium complex, which has also performed badly in Brazil in the past few years, largely because its largest markets are in the construction and motor industries. Fortunately, Votorantim is also involved in one of the few industries to have been virtually unscathed during the past few years of poor economic performance, forest products, which has been aided by strong demand for pulp from what is now its major market, China. The price of orange juice, also made by Votorantim, has also increased because of adverse weather and disease. Despite the strong contribution made by pulp and paper, as well as frozen orange juice, the Votorantim company made a loss in 2016 its first ever, while Intercement, with its close involvement with the construction industry, also performed badly last year.

Prospects for the cement industry remain cloudy, as although the economy as a whole is growing slightly this year, largely the result of the excellent performance of agri-business, the cement industry expects to make little more than 50mt this year, 5mt less than in 2016, as there are few signs yet of an upturn by the housing sector. Many observers think that it will not be until the early 2020s, that growth will return. There has been talk of amalgamation amongst players, but there has been no sign of any form moves regarding that as yet. DCi

Votorantim has 27 cement mills throughout Brazil.

GB Railfreight showcases refurbished coal hoppers as part of a contract with Tarmac

GB Railfreight (GBRf) has converted 49 wagons to move aggregates from Tarmac quarries in the UK.

The re-purposed coal hoppers, also known as Vulcan wagons, have been converted by removing the middle section to make them an appropriate length for aggregate use whilst retaining their 102-tonne maximum gross laden weight. An initial set of 24 wagons has been converted and they are working trains from Tarmac's Arcow quarry to Bredbury, Agecroft and Leeds. A second set of 25 wagons has now been converted and these will be working further services from Arcow and Swinden quarries. The newly-fitted wagons will convey a range of different size aggregate materials.

GBRf is one year into a five-year contract with Tarmac, hauling aggregates from Arcow and Swinden quarries.

John Smith, managing director, GB Railfreight, said: "GB Railfreight is delighted to work with Tarmac, hauling aggregates from its quarries, and the refurbishments we have been able to do as part of this service. We are very pleased to have been able to refurbish and upgrade 49 new wagons, and continue to find innovative ways to support our customers. By being able to take such innovative measures and have positive relationships with our customers like Tarmac, we are able to proudly call ourselves one of the leaders of our industry."

The arrival of the latest new wagon sets highlights the ongoing success of Tarmac's rail operations as a leading construction solutions business responds to increasing customer demand for delivery of high quality construction materials.

Chris Swan, Head of Rail at Tarmac, said: "Increasing rail freight capability supports our underlying commitment to sustainability, enabling us not only to lower the whole life carbon footprint of customers projects but also reduce our transport CO_2 levels. Efficient wagons have a key role to play in delivering these ambitions and so it's good to see the repurposing of materials and equipment with the arrival of this latest wagon set from GB Railfreight."

About GB Railfreight

Founded in 1999 and headquartered in London, United Kingdom, GB Railfreight is the third-largest rail freight operator in the United Kingdom, with a turnover in excess of £120m. GB Railfreight is one of the fastest growing companies in the railway sector and transports goods for a wide range of customers.

ABS awarded Subchapter M solutions contract

ABS, a leading provider of classification and technical services to the marine and offshore industries, has been awarded a Third Party Organization contract by The Great Lakes Towing Company (GLT) to support compliance with the United States Coast Guard (USCG) Subchapter M regulations.

"Every organization operating towing vessels in US inland waterways will have to comply with Subchapter M," says ABS Americas Division President Jamie Smith. "As an industry leader in towing vessel safety, ABS helps guide companies through the available compliance services to find the solution that best meets their unique needs."

The recently signed contract with GLT, which is a member of the American Waterways Operators (AWO), establishes ABS as the company's Third Party Organization (TPO), providing surveys for its fleet and audits of its Responsible Carrier Program (RCP). The company has long recognized the advantages of being proactive in demonstrating compliance.

"GLT has spent the past several years planning for the adoption of Subchapter M requirements into our operation and tug fleet," says GLT President Joseph Starck. "We looked to ABS as exclusive SubM partner based on its commitment to vessel safety, specialized technical understanding of towing vessels, and comprehensive range of services conveniently available to cover all our Subchapter M compliance requirements. We have enjoyed an excellent working relationship with ABS for years and feel certain that ABS will continue to contribute to our success.

Damen celebrates 90 years in the shipping industry

Damen is celebrating nine decades of operations in the shipbuilding industry. From small beginnings in the 1920s, the company has grown into a renowned maritime service provider that employs 9,000 people. With Dutch roots, Damen's expansion has been global. This growth can be viewed in terms of its yards, service hubs and other subsidiary companies as well as a globally-operating client base. For 90 years, Damen's vessel designs have successfully served customers operating on all over the world.

Damen was originally established by two brothers, Jan and Rien Damen, in 1927. From facilities located on the banks of the River Merwede in Hardinxveld, the Netherlands, they managed the growing firm into a well-respected business.

Production progress

When Kommer Damen took over in 1969, he introduced numerous changes to the ship fabrication process. Advances such as modular construction techniques and series production of standard designs resulted in considerable increases in efficiency. Damen's clients could benefit from shortened delivery times and flexible vessel configurations.

The subsequent growth since the late 1960s has been as swift as it was broad. The company's worldwide coverage developed with the acquisition of foreign yards and the establishment of dedicated service centres. The vessel portfolio has grown too — today the company's vessels serve an ever-evolving range of maritime sectors.

A team performance

Looking back at Damen's success over the years, Chairman Kommer Damen highlights the contribution made by the company's personnel: "I am honoured to celebrate 90 years of Damen. What started as a small team, has grown into a global company. And yet — we have achieved this while still retaining our family values.

"Damen owes its success to the commitment and dedication that has been invested by our past and present employees. It has always been important that our personnel enjoy their work and it is their passion that has made the company into what it is today."

Looking forward

With a view to forthcoming decades, it is essential to note that Damen is still very much a family-oriented business. Kommer Damen's four children all play significant roles in operations: Arnout Damen is Chief Commercial Officer, Rose Damen is Commercial Director at Amels, Annelies Damen manages the corporate properties portfolio, and Bear Damen recently directed the company's corporate film.

Never a company to rest on its laurels, Damen has always been defined by its constant forward-thinking strategies. It is this progressive mind-set that has kept the company focused on new opportunities and market developments. "This is an important year for Damen," comments Arnout Damen. "It is an opportune moment to identify the key characteristics that will strengthen our future position in changing the global maritime market."

"Continued investment into building strong relationships with our clients will play a major role. It will be by understanding their markets, their activities and their needs that we can help make them a success."

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, standardised ship-design concept Damen is able to guarantee consistent quality.

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

Damen offers a wide range of products, including tugs, workboats, naval and patrol vessels, high speed craft, cargo vessels, dredgers, vessels for the offshore industry, ferries, pontoons and superyachts. For nearly all vessel types Damen offers a broad range of services, including maintenance, spare parts delivery, training and the transfer of (shipbuilding) know-how. Damen also offers a variety of marine components, such as nozzles, rudders, anchors, anchor chains and steel works.

In addition to ship design and shipbuilding, Damen Shiprepair & Conversion has a worldwide network of 17 repair and conversion yards with dry docks ranging up to 420 x 80 metres. Conversion projects range from adapting vessels to today's requirements and regulations to the complete conversion of large offshore structures. DSC completes around 1,350 repair and maintenance jobs annually.

Cutter Suction Dredger 350 delivered to Heuvelman Ibis

Just three months from order to delivery

A Damen Cutter Suction Dredger (CSD) 350 has been delivered from Damen Dredging Equipment in Nijkerk, the Netherlands, to start work on a canal dredging assignment in the province of Groningen, in the north of the country. In order to execute the project, which involves the extraction of approximately 220,000m³ of sediment from the Winschoterdiep canal, the Netherlands-based marine contractor Heuvelman Ibis required a heavy-duty dredger at short notice. Two Damen BS 350 booster stations to enable pumping over long distances were also included in the order, placed in January.

Prior to delivery a number of options were added to the CSD 350 so as to optimise it for the project. These included a spud carriage pontoon to further boost production, and also the addition of anchor booms to allow unassisted repositioning. A complete production measurement system has also been installed. The result is a compact, highly efficient and accurate dredging machine. These options have not previously been offered on a CSD 350, but having been developed for this order will now become standard options for future clients.

The dredger was towed to Delfzijl, a journey taking 48 hours, to await deployment while the booster stations were transported by road. Final assembly took a week, followed by a few days of testing, after which the dredger was fully operational.

The fulfilment of the order, including designing and installing the options, and general finishing, took just three months. "The advantages to clients of Damen's policies of standardized production and holding popular vessels in stock ready for customization and finishing have once again been amply demonstrated," said Damen Sales Manager Vincent de Maat. "With a CSD 350 dredger available at short notice, we were able to work with Heuvelman Ibis to help them have exactly the vessel they needed to meet the needs of their own customers, within the required timeframe. We are very proud to have another CSD 350 dredger working in the Netherlands."

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An emerging hub

identifying growth opportunities in today's Sri Lanka

Sri Lanka's economy has been growing steadily since 2010, and its transition from a reliance on the agricultural sector to a more urbanized economy is creating new opportunities in Sri Lanka's marine and logistics industry, says Lars Bergström, Group Vice-President, Asia Pacific & Indian Subcontinent, GAC Group.

As a relatively small island nation, Sri Lanka's size has historically been seen as a barrier to the expansion of its marine and logistics sector. However, growing domestic demand and infrastructure investment, along with a recognition of the country's strategic location in the Indian Ocean, now appears to be stimulating growth opportunities for Sri Lanka's 'blue economy'.

Infrastructure development

Rebuilding the nation's infrastructure network is now a strategic priority for Sri Lanka. This means that services such as third-party logistics, breakbulk and cargo handling are central to the country's economic fortunes.

The Sri Lankan government's ambitious plans include attracting foreign companies and foreign investment loans to develop infrastructure and ports.

For example, negotiations are on-going between a China state-controlled company and the Sri Lankan government on investment in the Hambantota deep-sea port. Work is also under way for the Sri Lanka-China Industrial Zone Development Project in Mirijjawila, Hambantota.

The expansion of ports will have a ripple impact on the supply chain, creating new opportunities for expansion in areas such as husbandry, ship agency and bunker supply.

A changing picture for dry bulk

The breakbulk and dry bulk market in Sri Lanka consists mainly of imports of products such as fertilizers, cement, gypsum, clinker, steel and iron, timber and commodity foodstock. There is no export of dry bulk from Sri Lanka, since all the exports are containerized.

In 2016, the fertilizer market decreased significantly by some 36% mainly due to increased fertilizer prices in the domestic market. Cement import, on the other hand, has grown by 22%, as a result of an increase in construction activities in the country, especially in the hotel sector.

As more imports are now coming in to the country in containerized forms, the scope and type of bulk imports to Sri Lanka seem to be changing. For example, traditional bulk and

breakbulk cargo such as rice and sugar now hardly come into the country and even if they do, they arrive in containers. The Sri Lankan government is looking at renewable energy sources, which will call into question the country's longer-term requirements for coal imports.

Heightened building and construction activities in the country bode well for GAC Sri Lanka, which now handles an increased number of cement and clinker imports. The demand for steel imports arriving on break-bulk vessels has also increased due in part to the Hambantota terminal development.

Shifting priorities within the country have reshaped the dry bulk market in the past few years, but there is still an opportunity for those who can respond to the demand created by the rapid phase of development the country is experiencing.

Emerging cruise industry

The shift patterns of dry bulk shipping to and from Sri Lanka are part of a wider realignment of the country's shipping sector. For example, there is an increase in the number of cruise ships calling at the country's ports, in the light of a tourism boom. Each new vessel that calls in Sri Lanka requires security, berthing reservations, immigration management and other services. Each interaction with the cruise industry must be managed to a high standard, in line with the expectations of the cruise lines and their passengers. Both the availability and quality of such port services are essential to ensuring the success of Sri Lanka's cruise industry, and the expansion of this vital new income stream.

Piracy

Other regional and global trends have also played a role in creating new opportunities for the country's marine and logistics providers. One example of this is piracy.

GAC pioneered the concept of ship supply services at OPL Galle in 1994. In 2011, the company recognized the potential of Galle as an ideal location for maritime guard changes. As the closest landmass to major shipping routes between Europe and Asia, Sri Lanka proved an excellent supply location for security guards, which were mandatory on many vessels from 2011, at the height of pirate activity in the Indian Ocean. During this time, GAC handled the clearance of security guards at the airport in Katunayake, and took them to the Port of Galle where they were then transported into international (Off Port Limits) waters. The guards' weapons were provided from either shoreside depots or floating armouries. Although increased security in the region has now reduced the need for armed guards, GAC has been able to provide a diversified scope of services, which includes spares delivery, crew changes and provisions/stores delivery to vessels at OPL Galle.

Local dynamics

Marine and logistics providers must be mindful of local dynamics as Sri Lanka continues on a path of development. As the government goes full steam ahead with its plan to promote a globally competitive export-led economy, new legal and regulatory frameworks will have an impact on the services businesses can provide. This small yet dynamic market presents considerable opportunities to those that can offer a diversified service portfolio to support Sri Lanka's revival in the current era. DCi

Best quarter ever for Port of Ghent

For the first quarter of 2017, the Port of Ghent recorded a total cargo traffic of almost 14mt (million tonnes). That is by a large margin the best quarter ever. With this, Ghent Port Company sees its cargo traffic continue with the same fervour as in 2016, which was the best year ever.

With a total cargo traffic by seagoing and inland navigation of almost 14mt, Ghent registered nearly 10% more than in the first quarter of last year or an increase by 1.2mt. This is the best quarter ever for the overall transhipment by seagoing and inland navigation. In the first trimester, the port received 8% more seagoing vessels (a total of 775) than in the same period in 2016. For inland navigation, there was an increase of over 4% in the number of vessels (a total of 3,680) with a total tonnage that was 10% higher.

Also a record for seaborne cargo

The last quarter of 2016 may have broken the record of best one ever for the port's seaborne traffic, however the first quarter of 2017 does it again.

In the first three months, with a total of 8.2mt, seaborne cargo traffic has improved by no less than one fifth as compared to the same period of last year.

Inland navigation reaches 5.6mt of cargo traffic. This is a decrease by 160,000 tonnes or by 2.7% as against the first quarter of last year.

Cargo categories by seagoing and by inland navigation

For seaborne cargo traffic, iron ore, coal, scrap, rapeseed and dry fertilizers are the goods that are on the up. Petroleum products are going down.

Expressed in lane metres, ro/ro traffic experienced a growth by 20% to 530,000 lane metres. Conventional general cargo crosses the threshold of 1mt (+20%), mainly because of the increasing supplies of steel slabs.

The decrease in inland navigation is caused by the reduced transhipment of iron ore. This is however compensated by the increasing traffic of iron ore by sea. Maize, wheat, crude minerals and building materials on the other hand are doing very well. It has been a good start of the year for container traffic by inland navigation: +20%, the third best quarter ever. This is the result of the further development of new inland navigation connections with Lille, Rotterdam, Zeeland Seaports and Antwerp.

Liebherr sets up new branch office in the Port of Hamburg

In mid-April this year, Hamburg Port Authority (HPA) and Liebherr-Nenzing Service GmbH signed a lease agreement for a 44,000m² site at the Kuhwerder Hafen harbour basin. The manufacturer of maritime cranes and other machinery will set up a new operating site for its Harburg-based sales and service company on the centrally located site. Construction is expected to start in November 2017.

The new location borders on the Steinwerder-Süd district, for which the HPA has initiated a contest to gather ideas for an innovative concept of use. The site will house a workshop (2,160m²), a warehouse (1,080m²) and an office building (3,125m²). All in all, 90 employees will work at the location. Moving in is planned for the first quarter of 2019.

The new branch office will be in charge of selling and servicing mobile harbour cranes, ship cranes, and offshore cranes as well as construction machinery from the duty cycle crawler crane, crawler crane and deep foundation equipment product range. It will also offer spare part and repair services.

Liebherr-Nenzing had been on the lookout for an appropriate location in northern Germany close to the port. Under its land restructuring programme the HPA was able to offer the company attractive growth prospects, which is exactly what the port development plan calls for. "Liebherr will create long-term jobs in the heart of the port and continue to support Hamburg's businesses with its know-how," says Jens Meier, Chairman of the Management Board of the HPA.

"We want to make use of the growth potential and secure the long-term future of our universal port," says Frank Horch, Hamburg Minister for Economic Affairs, Transport and Innovation. "Above all, we strive to secure the many different jobs the port offers, create new ones and increase the value added. Liebherr's move to the site is a perfect example of this development aim."

"By getting Liebherr to locate to the site, the HPA managed to keep the company, and the jobs it offers, in Hamburg. At the same time, the HPA offers Liebherr long-term development prospects enabling it to expand its business activities in the Port of Hamburg," adds Uwe Weidemann, Head of Sales and Project Development - Port Estate Division at the HPA.

"Due to its logistical advantages we have made Hamburg our hub for rental and returned equipment as well as for all kinds of repair services from the European region," says Jörg Schmidt, Managing Director of Liebherr-Nenzing Service GmbH.

Transport by road in the Port of Ghent at lowest level ever

Goods are transported to and from companies in the Port of Ghent via sea-going vessels. A large part of these goods are transported to and from the hinterland. The portion of goods transported by road has declined to 34% and has never been so low.

Moreover, transport via inland shipping continues to increase. With 55% of transport occurring via inland shipping, a record was even set for the second year in a row in 2016. This finding is from a study by the Ghent Port Company into the use of all transport options to and from the hinterland in 2016.

Share of road transport continues to decrease

Transportation by road from and to the hinterland is 34%. This is 6% less than in 2010. This is also the lowest share of transported tonnes (11.9mt [million tonnes]) ever recorded. So, for the first time ever, the share of transport by road has dropped below 35%, which is the amount that the Port Company strives for.

New record for inland shipping

Transportation to and from the hinterland via inland shipping set a new record: inland shipping is responsible for more than half of all hinterland transport with a share of 55%. This is a 5% increase since 2010. This is (almost) the best year with regard to the quantity of transported tonnages too.

The Port Company wants to continue stimulating the use of inland vessels as a sustainable transport solution; this is in keeping with Flanders' and Europe's policy. The Port Company does this by investing in special infrastructure such as the construction of new quay walls, by extending jetties and making the mooring of inland vessels in docks safer.

Share by rail decreases slightly, tonnages at highest level

The share of rail transport between the hinterland and the port decreased slightly. The railway has an 11% share (-1%). In transported tonnes, the 5mt level was surpassed for the first time. This is therefore a new record as well.

Focusing on sustainable transport

Ghent Port Company focuses on the sustainability of goods transport with the hinterland. The Port Company is striving for 15% transport by rail and 35% by road by 2020. The desired 50% via inland shipping was surpassed for the fifth time in 2016. Transport by road fell under the intended share of 35% for the first time in 2016.

Annual study on transport options

Every year, Ghent Port Company studies how goods are transported to and from companies in the port from and to the hinterland. Is that by railway, via inland vessels or with lorries by road? In this way, Ghent Port Company maps out the traffic of companies with maritime waterfront activities that register at least 20,000 tonnes of cargo transhipment in the port annually. The most recent figures are related to 2016.

Multimodal port

Thanks to its location in Western Europe and its infrastructure, the port of Ghent is a multimodal port. Goods that enter the port are transported onwards with sea-going vessels, inland vessels, by train, by lorry and even by pipeline. This mix of transport options is a strong asset.

Cargo variety highlights capabilities at Thunder Bay

Thunder Bay Port facilities were kept busy in April with a variety of waterborne cargo. While grain shipments continued at a strong pace, the diversity of cargoes handled during the month highlighted the port's versatility.

In addition to grain, shipments of coal and potash rounded out dry bulk exports from Western Canada. Other bulk cargoes included inbound commodities for local distribution: road salt, liquid calcium chloride, and liquid petroleum.

Variety was the theme at the port's general cargo facility, Keefer Terminal. International project cargo shipments destined for Western Canada included four 250-tonne electrical transformers and a 113-foot long urea pressure vessel. A modularized structure was loaded at the Terminal for marine transit to Southern Ontario.

As of 30 April, the port's year-to-date cargo volumes are 26% above the ten-year average. Thunder Bay Port Authority is anticipating continued steady shipments through May.

New shiploader for Vostochny

The coal terminal at the Russian Port of Vostochny, which is located in Primorsky Territory, has taken delivery of its first new shiploader. This is needed as part of the Phase 3 development of the terminal. A second unit is also scheduled. These have been acquired as part of a contract signed with Marubeni Corporation (Japan) and can load coal at rates of up to 3,800 tonnes per hour.

The design of the shiploaders was put together by Vostochny Port JSC and Port Management Company LLC in compliance with the latest standards and requirements on labour safety and ecological protection.

The new units are similar to those operating at the company's existing coal terminal, although have been subject to technological upgrading by the Japanese manufacturers, following consultations with the Russian purchasers.

According to Anatoly Lazarev, Managing Director of Vostochny Port JSC, the latest generation of shiploaders incorporate an improvement of the dust suppression water curtain system. In addition, to improve safety, the new shiploader will be monitored by the terminal's CCTV network, which has been fitted with state-of-the-art colour-video cameras with 22-x zoom for day/night shooting.

Vostochny Port JSC is Russia's largest common user coal terminal, equipped with wagon dumpers, conveyor systems, ship loading equipment and a unique multilevel system of magnetic separation. The terminal exports coal from various producers in Russia. Last year it handled 23.5mt (million tonnes) of coal, equivalent to 20% of all maritime exported coal exports in Russia and around 30% of coal transshipment via the ports of Russia's Far East Basin.

The Phase 3 development includes the construction of entirely new rail infrastructure.

The terminal extension will become fully operational later this year, when capacity will be boosted to 39mt, which should be met by 2019. The majority of the coal will be delivered from the Kuzbass field. *Barry Cross*

Bergé expands Santander agribulk storage facilities

Spanish terminal operating company Bergé has expanding its warehousing capacity for dry bulks at the northern port of Santander. The new facilities, which are on the outskirts of the port, are aimed at improving storage of agribulk. Enhanced handling equipment has also been acquired.

In total, 3,500m^2 of new warehousing has been brought on line, capable of storing up to 12,000 tonnes of dry bulk, particularly cereals and flour.

In May, Bergé is also due to make operational a new nine-metre high hopper that has a 250-tonne capacity, which will also be used in the handling of grains and flour. Dust suppression features have been built into this new equipment such as a new flex-flap, upper enhancement protection, side walls and slatted curtains, all of which will improve environmental standards.

Although a major player in the Spanish market, in 2016, at Santander, Bergé handled around 900,000 tonnes of general cargo and dry bulk. Of this, agribulk accounted for just 180,000 tonnes, which in turn was about half the total for the port as a whole. *BC*

Jewo bulk-ships stainless steel via Rotterdam

In early May, for the first time in many years, Jewometaal Stainless Processing B.V., part of the German ELG Haniel Group, started shipping scrap material to the Far East in bulk again rather than by container. "We always look for the best way to ship our cargoes. This is now the best solution."

After 15 years, Jewo is once again opting for a bulk carrier to ship cargo to the Far East. One reason is the high container price. "Choosing bulk carriers means that cargo stakeholders have a good way to ship their scrap flows again," says Jewometaal Operations Manager Eric Oosterom.

Scrap to the Far East

"We do ship a great deal of bulk cargo, but mainly within Europe. Ships aren't queuing up to carry scrap to the Far East." Nevertheless, Jewo saw Chipolbrok and Sinepol Shipping and Agency as the ideal parties to organize a scheduled service to the Far East. "We are very happy with this solution," Oosterom says.

More cargo via Rotterdam

In this way, Jewo and Chipolbrok aim to make more frequent shipments between Rotterdam and Asia. "We are very happy with this option for now," Oosterom says. "But we cannot see into the future." Oosterom is most impressed by the solution-oriented attitude of shippers, shipping companies and consignees: "Together, we are flexible. And in that way, we can realize shared goals."

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NK TEHNOLOGIJA offers solutions for bulk

Integrated solution for grain handling (Klaipeda, Lithuania).

Baltic Sea ports operate in tough and ever-changing conditions influenced by both market and political aspects. This is particularly true for port terminals specializing in bulk handling operations.

Cyclic operation equipment provides reliable capacity and, above all, versatility for terminals. Indeed, having the necessary technological equipment on hand makes it possible to handle any type of cargo, packaged or bulk. However, the efficiency of handling

Assembly of 2,000tph coal shiploader designed and delivered by NK TEHNOLOGIJA in Riga, Latvia.

cargo handling in Baltic Sea ports

bulk cargoes using cranes is low, in terms of costs per tonne handled.

NK TEHNOLOGIJA has implemented several original solutions for creating port terminals based on the terminals currently being built and already existing ones, equipping those with cross-functional technological equipment.

In the past 2.5 years, 2.5 million tonnes of bulk cargo has been handled by two tilting spreaders in the Port of Ust-Luga, Russia.

One of the projects was designed for a general-purpose terminal in Riga, Latvia. A rail wagon tippler and a shiploader were integrated into bulk handling technology. At the same time, eight gantry cranes are located on berth, and are used for both loading and unloading purposes. Within the first development stage, a 2,000tph (tonnes per hour) shiploader with a tripper car for coal handling, designed and assembled by NK TEHNOLOGIJA, has been delivered. A rail wagon tippler and cranes will be integrated into this unified system shortly afterwards.

Another example of such development solutions was designed for a general-purpose berth in port of Klaipeda, Lithuania, where the berth was equipped with gantry cranes and a 750tph shiploader travelling on rails. NK TEHNOLOGIJA just completed a project to refurbish a shiploader and, most importantly, broadened the scope of the shiploader operations by designing and carrying out a solution for grain intake directly from trucks.

Meanwhile, a container handling terminal in port of Ust-Luga, Russia, was equipped with an option for receiving fertilizers from hopper cars. Cargo received is being stored in 20ft containers until the next bulk cargo vessel arrives. NK TEHNOLOGIJA designed and delivered a unique tilting spreader, device for grabbing, tilting and unloading these containers directly into the ship hold. This technology has been integrated and has been in operation for more than two and half years with a total of 2.5 million tonnes handled so far.

Port of Stockton appoints new advertising agency

The Port of Stockton has selected Ivie Communications, LLC, to manage its customer-related marketing communications.

"One of the reasons we chose Ivie Communications is because they have 35 years in the transportation and logistics industries. Their strategic thinking and outstanding creative work fits right into our needs as we continue to grow our business," said Pete Grossgart, marketing manager for the Port of Stockton. "They will be managing our customer-related advertising, media planning, public relations, strategic marketing plans, trade show booth, print materials, direct marketing and the creation of original photography and illustration."

"We are honoured to add the Port of Stockton to our growing list of clients. They have such an interesting book of business and service offerings that are unique to their industry." said Jill Ivie, president of Ivie Communications. "We have a history of serving clients from all types of industries across the globe, including high tech, consumer goods and logistics and transportation. Our 35 years worth of experience specific to the transportation and logistics industries includes working with ocean carriers, stevedores, rail service providers, intermodal marketing companies, drayage, warehousing, container leasing, ship management, cargo and container surveying and technology. We create communications for our clients that acknowledge and speak to the needs of their customers rather than just doing a bullet list of services and data specifics. Ivie Communications targets markets that matter with messages that count."

Ivie continued, "I have the unique experience of sitting on the client's side of the desk. I managed global marketing communications activities for a multi-billion-dollar international company, APL. I have a keen sense of what kind of issues my clients are up against both internally and externally, and part of our job is to make their lives easier, help them succeed and make them be a hero in their own company."

The Port of Stockton is an inland port facility conveniently located in the extended San Francisco Bay Area that has handled cargo since 1933. It offers 7.7 million square feet of warehouse, storage and handling facilities for both dry and liquid bulk materials, and equipment to handle break-bulk and containerized cargoes by land and sea. The channel has a depth of up to 40 feet that can accommodate Panamax-sized ships up to 80,000 class. It has 7.7 million square feet of warehousing space.

Ivie Communications, LLC, is a Half Moon Bay, California-based advertising agency. The company was founded in 1996 to provide strategic marketing plans, brand management, research, identity, public relations, advertising and media planning, direct mail, social media management, photography, illustration and websites and can serve as an out-sourced marketing communications department. The company has provided services to multiple industries across the globe including high tech, logistics and transportation, travel, telecommunications, non-profit, construction and building supplies, human resources, health care, manufacturing, environmental, education, consumer goods, financial products and tourism.

TPP seeks solace in coal

An expansion of generating output by the CFE coal-fired power station close to the Mexican Pacific port of Lázaro Cárdenas could throw a lifeline to Pacific Port Terminals (TPP), which has struggled to attract significant flows of iron ore since it was established in 2013.

In that year, it handled 3.6mt (million tonnes) of exports, of which the majority was shipped to China. Traffic for that year was significantly higher than the forecast 600,000 tonnes. However, the government detected the presence of organized crime in the industry and therefore imposed major restrictions as of April 2014, which hit the states of Michoacán and Colima especially hard. In that year, these were responsible for 29.4% and 15.6% respectively of the national output of iron ore, which amounted to 24.4mt, equivalent to a 9.1% drop on the previous year's total.

Subsequently, the situation regarding iron ore exports has notably declined. From a peak of 10mt in 2013, just 41,440 tonnes were shipped last year. The concomitant value of exports has also dropped dramatically: from $363.5 billion in 2013 to $820 million in 2016.

The downturn in Chinese demand has also been a factor. In 2006-2016, exports of iron ore to that country accounted for 89% of the total, when the price was $120/tonne. That subsequently collapsed to just $40/tonne, but is currently around $80/tonne.

Given the dramatic loss of iron ore traffic, TPP has sought alternatives, involving the handling of some recent consignments of steel, urea and minerals. Nevertheless, for the most part, TPP's infrastructure has remained relatively idle.

At present, the CFE power plant is supplied by Carbonser, whose terminal in the port ships up to 20,000 tonnes daily to the facility. However, TPP has revealed that up to 1.3mt of additional coal will now be required by the plant, much of which Carbonser will not be able to accommodate. The surplus will therefore switch to TPP.

However, existing infrastructure at the terminal is having to be rebuilt, so the impact will not be immediate. *BC*

Spare a thought for the port agent

Often overlooked, port agents are the small army of people with an encyclopaedic knowledge of their local ports and the surrounding hinterland. They provide the glue that binds the ship with the port and they deliver the vital services required to make a port call both efficient workable.

According to FONASBA, the association for port agents, more than 130 different port-related tasks are regularly undertaken by agents — and this doesn't include the actions involved in planning a call, or those required to be followed-up once the ships has departed. As a maritime 'fixer', they're called upon to book the berth, arrange cargo operations, facilitate crew changes, supply victuals plus the many other activities required by a modern ship in port. The wide and complex variety of tasks demand an agent to maintain relationships with a great many parties and gather, store, collate and regurgitate huge amounts of information.

At the same time, they need to track progress for the many ships they are currently looking after, account for all expenditure and remember to re-bill their clients before cashflow dries up. On top of all this, agents are constantly on the lookout for new business and must produce comprehensive 'offer' documents for owners to consider.

And because their vital role is often taken for granted, this sector has largely been left to fend for itself when it comes to developing technology to streamline their working day. Other, higher profile sectors are swamped with technology options – carriers, port authorities, cargo interests to name just a few are well supplied with software houses seeking to make their operations more efficient.

Ignored no longer

So why has the port agent been ignored? The answer is probably because the agency sector is highly fragmented. A handful of large, regional or global companies dominate this space but the majority of activities are carried out by small agencies serving just a few — or even a single — port. Often, they operate on very thin margins and so are thought to be too insignificant to bother with.

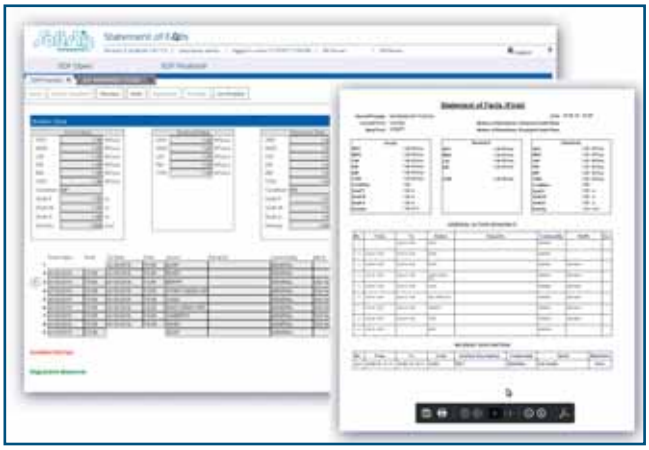
But that's not just short-sighted, it also shows that software houses are missing an important trick. Because agents must juggle significant amounts of information, maintain relationships with a variety of partners and outstations, and they often conduct their business whilst on the move, a technical solution is ripe for development.

Cloud technology

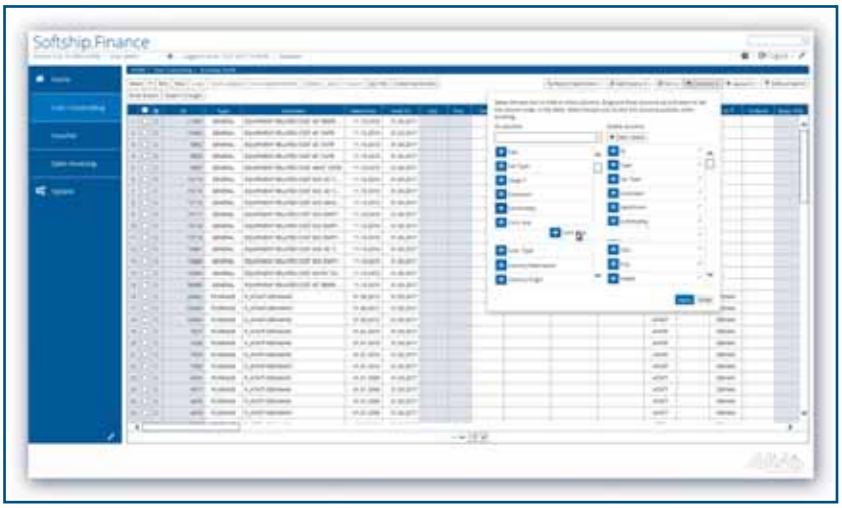
Most smaller agencies are running their businesses from a variety of unconnected spreadsheets, databases and even hard-

copy notebooks. Softship — one of the world's largest software houses operating in the maritime space — has recently launched Softship.SAPAS (Softship's Advanced Port Agency Solution), a web-based tool optimized for PCs, tablets and smartphones. It uses cloud technology ensuring all data is stored securely but available through any internet connection — perfect for those regularly on the move.

Softship.SAPAS does away with the paper and spreadsheets and, importantly, eliminates the re-keying and constant transferring of information from one medium to another. It operates from a core database that is flexible and which contains pre-loaded data (such as location information) alongside an agent's proprietary information that is re-used throughout the system.



Port tariffs form a large part of the cost of a port call but can be extremely complex. Sometimes they are applied as a lump sum and sometimes as an amount per DWT, GRT, NRT, or a more complicated calculation. Softship.SAPAS allows simple and complex tariff structures to be captured, stored and re-used including different rates for different cargo and/or vessel types. Once a tariff has been registered in the system, it is automatically 'looked-up' when required.



Winning and servicing new business

Typically, an agent will be competing for new business whilst working on existing accounts. Owners require the production of comprehensive 'offers' from an agent to give a clear estimate of the likely cost of the port call. This is a time-consuming activity but can be streamlined by re-using information already stored. Softship.SAPAS will take owner, charterer, vessel and port information and marry it with cost items such as pilotage, berthing and towage to generate an 'offer'.

Currencies can be automatically converted and aligned with an owner's requirements and tariffs imported. Once complete, the "offer" is then generated by an inbuilt report writer which allows the agent to create a customized and professional looking document to send to the client. Templates can be created and re-used.

The heart of the system is its port call facility — this is where Softship.SAPAS manages the range of activities required when the ship is in port. This includes actions relating to the vessel itself, crew, suppliers, port authorities, customers and more. If required, a Statement of Facts is generated and emailed to the client, and can be used by the agent to ensure all activities are completed on time — reminders and priorities can be set.

Keeping track of costs

Given the complexity of operations in port and tight operating margins, the careful control of accounts is critical to the success of every ship agency business. As such, a core feature of Softship.SAPAS is the handling of all disbursement payments, allowing agents to maintain complete oversight of payments and accounts received, with notifications and warnings to help them keep track. Once all final costs are known after the successful completion of a port call, the system will generate a final disbursement account and automatically attach all supplier invoices. When complete, the agent will 'lock' the account and create a final report for the client.

Mindful of the tough economic environment currently facing agents, Softship.SAPAS is offered on a 'pay-as-you-go' basis requiring zero upfront investment. Similarly, it is open to as many agents needed within a single company, for no additional fee.

Long overdue but no longer ignored, the port agency sector is now able to reap the many benefits delivered by modern IT systems and software. It's important to protect and nurture this vital link in the maritime supply chain as without our army of agents, ships and ports would not enjoy the same easy relationship they have today.

Lars Fischer is Managing Director of German shipping IT provider Softship Data Processing Ltd, Singapore, a wholly owned subsidiary of Softship AG, the leading provider of software solutions to the international shipping sector.

Scandinavian synopsis

dry bulk activity on the peninsula

Port of Pori.

Barry Cross

Oslo, Pori and Grenaa retain position as important Scandinavian dry bulk ports

The Norwegian Port of Oslo handled 1.8mt (million tonnes) of dry bulk in 2016, which was an increase of 10.3% over 2015. According to Carl Johan Hatteland, the port's business development advisor, a large part of the growth came from increased construction activity in and around Oslo, driving up volumes of the raw materials needed for the production of such commodities as concrete and asphalt.

"The port's main dry bulk commodities are salt, grain, cement, various grades of gravel (used to make concrete, asphalt and other construction works), scrap and RDF," says Hatteland.

Inbound consignments for hinterland use arrive by sea, while some dry bulk does also come into the port by road for despatch by vessel.

Dry bulk vessels vary from 120,00dwt to 10,000dwt. Size is relatively stable, serving the same main customers and end user segments.

Hatteland explains that the port is pulling out of certain existing areas, which will instead be used for urban development. At the same time, as the city grows, more and more raw materials are being brought in by sea. Those companies active in the construction industry are therefore very keen to establish themselves in the port, both to allow them to increase their use of facilities there to bring in raw materials and to ensure they have a base in the city.

"There is also a considerable move within the construction industry towards a 'green shift'. From an industry perspective, this makes it legitimate to invest in very space efficient facilities. However, this is also somewhat controversial, since it puts into question what activities should be in ports. Space in ports is limited, although in Oslo there is capacity for further growth as areas of the port are restructured."

Asked about external restraints on the handling of dry bulk commodities, Hatteland notes that environmental legislation — and the ambitions behind it — is, in fact, a main driver for growth, but the kind of activity and products related to the construction industry are not always easy to handle in respect of how they look, the noise generated whilst handling them, and also dust issues, even when these fall within what legislation and regulation requires.

"Inevitably, there are issues with 'not in my back yard' from local residents," he says.

Despite this, around 50–60% of concrete supplied to the Oslo market comes from the port, based on raw materials supplied by sea. In addition, 15–20% of the asphalt is also made

Handling coal at the Port of Pori.

in the port.

Indeed, Hatteland suggests that, "There is considerable scope for increased market share in asphalt."

As for other added value, salt is also bagged, while there are several initiatives to sort and process construction and bio-waste to increase reuse/circulation of materials through adding/purifying value. Again, the 'green shift' is predominantly a driver behind port growth and for greater use of sea transport.

Finally, in respect of 2017, he predicts that there will not be much further growth in the dry bulk sector, but there are underlying drivers to ensure substantial growth over the next few years.

In 2016, the Finnish Port of Pori reported dry bulk traffic down around 150,000 tonnes to 1.2mt. According to spokesperson Pekka Friman, the port authority is not expecting any dramatic changes in tonnage handled during the current year.

Pori mainly handles coal, which saw a drop of approximately 10% last year.

Consignments on the landside are moved by both road and rail, but not inland waterway, since the port does not have a connection. Coal, while mostly moved by conveyor, is also shifted by road haulage vehicles and shovel loaders.

Vessels transporting shipments can vary between 4,000dwt and 170,000dwt.

Friman notes that changes have had to be made to operations in recent years because of environmental legislation, which has meant that dust emissions have had to be controlled.

No added value is undertaken on the coal whilst it is in the port.

Coal handling at the port takes place at the Tahkoluoto deep-water harbour, where draught of up to 15.3 metres means that Capesize vessels can be accommodated. A shiploader which has a capacity of up to 1,200tph (tonnes per hour) is available; this mainly handles ferrous sulphate, and Ferrix. In addition, the portal cranes can discharge consignments at approximately 2,000tph, although these figures depend on the type of goods. In addition, the deep-water harbour is well-equipped for bulk goods transshipment operations, too.

The quay is 450 metres in length, with one 40-tonne and one 32-tonne crane deployed. These are used for coal and ilmenite loading and unloading.

A total of 9,500m^2 of warehousing facilities is also provided, while a 5km-long overland conveyor moves coal on the quay to the adjacent Fortum Power and Heat Ltd's power plant.

Friman explains that Fortum is not the only client handling coal in the port. SSAB also manages some transhipment consignments of this commodity, he says.

In fact, Tahkoluoto harbour is divided into two separate berths: one of 140 metres, with 10 metres of draught alongside, and the other of 450 metres, where maximum draught is available. Currently, the port authority is looking for potential new clients to operate at the shorter and shallower berth, which he says is extremely suitable for all types of cargo, including dry bulk.

The Danish Port of Grenaa has decided that its future strategy should be to concentrate more on what it is good at.

"We should not just grow; we need to grow by doing more of what we're really good at," said Henrik Carstensen, CEO at Port of Grenaa, summoning up the new policy. "We need to decide: What are we good at? What do we want to achieve? And what do we need to do to achieve it?"

The strategy aims to secure the port's position as one of the ten most important ports in Denmark by 2020. By enhancing focus, Carstensen hopes the Port of Grenaa's plan will ensure constant development and growth up until the end of the decade.

"The port should not just grow, but should manage that growth by focusing on the unique strengths we have, and use them offensively in our efforts to cement the Port of Grenaa's position as one of Denmark's biggest commercial and industrial ports," reiterated Carstensen. "We already have a comfortable position in the top ten. The port's accounts for 2015 showed a profit, and our financial forecast for 2016 looks very good. We need to exploit that position by doing more of what we're good at, and let others do what they're good at. We need to dare to be selective."

The change of direction comes at a time when competition among Danish ports is increasing, at the same time as many of them implement structural changes. Many of those close to city centres are increasingly designating some areas as residential and recreational. That, in turn, places some very restrictive environmental limitations on the activities that can be conducted within a port.

Nevertheless, this is not necessarily the case at Grenaa, which is a dedicated industrial port whose location in relation to neighbouring residential areas means it has excellent potential to increase its activities without bothering its neighbours. That's a position it intends to exploit by attracting activities that are dependent on plenty of space and less stringent environmental criteria, particularly those concerning dust and noise. In addition, the port has other, unique advantages in the form of deep waters and close proximity to the sailing routes of the Kattegat.

"Overall, these factors give us a number of unique

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competitive advantages that must be promoted to attract new customers and partners with a specific need for the options and services that the Port of Grenaa can offer. We must target customers and partners able to make use of the areas in which we are already strong, have experience and the facilities required," noted Carstensen.

Dry bulk is certainly one of these areas.

The port has significant trade in grain and foodstuffs, woodchip and pellets, sand and gravel, road salt, feed salt and lime, and scrap metal. To handle these, the various operators have acquired specialist cranes, while both covered and uncovered stockpile areas are available.

The various warehouses are located close to the quay and have either solid concrete floors or concrete paving, with lighting in every warehouse. The automatic electric doors are also lockable, while inside there are no pillars, so the whole area can be used for storage. Several of the insulated warehouses can also be heated. The size of facility ranges from 750m^2 to 2,000m^2, totalling 24,000m^2, with the two large facilities given over completely to dry bulk.

The port also offers value-added services for bulk shipments. These include weighing, sample-taking, bagging up and drying facilities, and Big Bag handling.

"These special competences and strengths must be promoted more widely and weight more heavily for the Port of Grenaa's market position," noted Carstensen.

One of the main infrastructure investments that will directly benefit the landside movement of dry bulk shipments is the new bypass, which is being built to the north of Grenaa. This will take heavy traffic from the north around the town and directly into the port, where facilities for loading and unloading are excellent.

"We will be the envy of many other ports. This is yet another advantage at a time when other port towns are laying down restrictions for heavy traffic and are struggling with gridlock in their town centres," Carstensen suggested.

Significantly, new sorting facilities for metal scrap are increasing activities at the Port of Grenaa, where investment of $8.8 million has been made by Stena Recycling in a new plant. This will enable around 20,000 tonnes of additional scrap metal to be exported.

The plant, which opened at the end of 2016, incorporates a new shredder for fine shredding and sorting metal scrap. This, in turn, will boost the amount of waste that can be recycled. Now, just 10% of the scrap received is sent for incineration in power plants.

The rest of Stena Recycling's metal mountain in the Port of Grenaa is now sorted into different metals after shredding. These can be iron, aluminium, stainless steel, copper and so on, which are required for recycling in countries such as Sweden and Turkey.

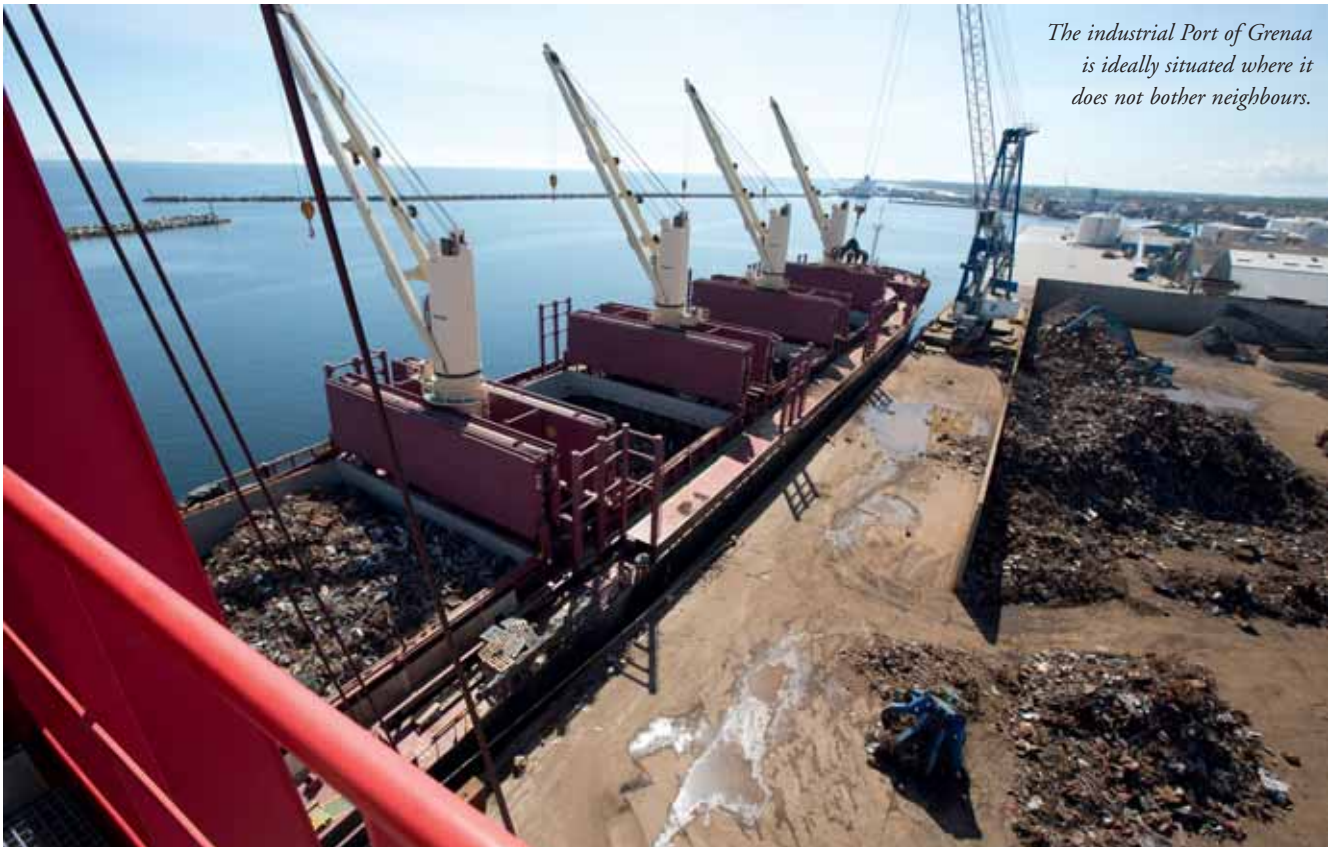
Stena Recycling's COO Mette Boysen explained that recycling metal saves enormous resources and CO_2, which is why it is worth investing large amounts in extracting higher percentages of metal for recycling when sorting.

The putting into operation of the new plant, which occupies a 1,500m^2 facility, took around three years to complete.

This facility will perform extra fine sorting of the material left when crushed metal scrap has been through the first station, which is where pure metal pieces are extracted. The residual material — known as SLF — represents around 20% of the scrap processed. SLF, which consists of plastic, rubber, textiles and so on, used to be dumped. But thanks to the new plant, more revenue can be generated by fine-sorting SLF and recycling the metal component it still contains.

"The objective is to ... [eventually] recycle almost 100% of a scrapped car. There's a lot of potential, for instance, in recycling plastic waste, and the general global environmental trend is towards as little dumping as possible by recycling as much as possible, or converting it to energy," noted Boysen. "But in many instances — such as recycling plastic — the calculations involved are very complex. It's not only the technological options that are important. We always have to consider the financial aspects, where global mineral prices come into play, as they are important to those industries that reuse metal, plastic and so on."

The existing Stena Recycling plant at the port used to handle 260,000 tonnes of scrap, which will now be increased to 280,000 tonnes.



The industrial Port of Grenaa is ideally situated where it does not bother neighbours.

Port of Inkoo handles 1.5 million tonnes of dry bulk a year

The Port of Inkoo in Finland is a privately owned public commercial port that offers services for vessels in addition to clearance and forwarding services. There is plenty of both outdoor and indoor storage space and two weighbridges in the area. Service at the Port of Inkoo is flexible and responsible, whether the visiting vessel is big or small. The port can receive even Panamax-size vessels as the maximum draught of the channel is 13 metres.

Enhancing its clients' business

The port is located in scenic Inkoo, in the bay of Fagervik. Good road connections guarantee quick transportation of cargo. The distance to the Helsinki Metropolitan Area is only approximately 60km by road.

The Port of Inkoo is a winter port, which means that it is open all year round. Ice conditions are easy during an average winter, and the fairway is open almost throughout the year. If necessary, icebreaking is arranged with the help of a partner.

The competitiveness of the port is based on its cargo storage and handling possibilities, long-term experience with dry bulk handling and the geographical location of the port within good maritime and road connections.

Dry bulk

The Port of Inkoo is specialized in handling and storing dry bulk materials and it is the largest port in Finland to handle various raw minerals and mineral aggregates.

The annual tramp shipments of the port add up to around 1.5 million tonnes, half of which are re-handled at the terminal. The port area covers 107 hectares of which around 35 hectares are currently in use. A cold storage space of approximately 10,000m^2 is built on a fenced seven-hectare storage area in the immediate vicinity of the port.

In the future, the Port of Inkoo plans to focus more on the handling of biofuels.

Comprehensive logistic

The Port of Inkoo develops and implements multifaceted transportation solutions its customers' shipments. Its extensive experience in clearance, good location and continuous co-operation with other actors in the port provides many benefits for visiting vessels. The port uses the Wellamo Data WD.Port-computer system as its operational control system.

Versatile equipment

The port has two ro-ro ramps, one 17m-wide stern/bow ramp at the end of the basin and one 8m-wide side ramp. The port is equipped with four 10-tonne cranes on rails, one 20-tonne crane on rails and tracked multipurpose cranes designed for handling especially timber, logs and unitized cargoes. In addition, the port has front loaders, trimming machines, forklifts and a full-length weighbridge. If needed the port arranges icebreaking.

Meeting regulations

The port follows the recommendations and regulations stated by the Baltic Marine Environment Protection Commission that concern the prevention of pollution of the sea. As the port mainly handles different types of bulk materials, the environmental policy of the port is focused on minimizing dusting, decreasing and proper handling of cargo residues and waste, and controlling noise problems. The port has a waste management plan and directives. All discharge into the sea is prohibited in the port area and solid waste must be sorted. The waste collection point for vessels is situated opposite to the harbour basin.

Visiting the Port of Inkoo

The Port of Inkoo offers versatile services for its customers. In practice, the port and vessel services include all the practicalities that promote the mobility, maintenance and cargo traffic of the vessels as well as communication with partners.

Each vessel receives its own ship agent through whom services are taken care of promptly and easily. For example mooring and unmooring of the vessel is to be ordered in advance through the agent. Towing must be ordered at least three hours beforehand.

During the winter months. the icebreakers of Arctia Shipping assist the vessels from the sea to the port area and vice versa within the prevailing ice limitations.

The port delivers potable water and also electricity (380/220V 50Hz) to the vessels in the port area. Should a vessel be in need of maintenance or repair, maintenance companies operating in the area can be contacted by the agent.

NORDEN's fleet increases its fuel mileages significantly

NORDEN's fleet has increased its fuel mileage significantly

On 1 January 2013, NORDEN set up a specific department with the task of increasing the fleet's fuel efficiency, and this has had a large effect.

Fuel costs made up about 60% of voyage costs, when NORDEN in 2012 decided to set up a specific department with the task of increasing vessels' fuel efficiency and thereby contributing to economic optimization of voyages — regardless of whether these voyages are undertaken by owned vessels, long-term chartered vessels or on vessels chartered for a single or just a few trips.

Since then, oil prices have dropped significantly meaning that today fuel make up approximately 45% of voyage costs. However, there are still large sums of money to be saved primarily by ensuring that the propellers are polished and that the hull is free from fouling, and by ensuring that vessels travel at the optimum speed.

In addition, it is NORDEN's overall objective to contribute to more efficient and sustainable global trade and thereby increased global prosperity.

Total savings: US$24.9 million

NORDEN's special team working with fuel efficiency saw the light of day on 1 January 2013. The first year was spent on establishing the monitoring of all vessels — read a description of the monitoring system in separate article — and the results are remarkable. During the years 2014, 2015 and 2016, the owned and chartered dry cargo vessels and product tankers in NORDEN's fleet have altogether reduced their fuel costs by U$24.9 million — and they have done this entirely by utilizing the fuel more efficiently.

If the current efficiency level continues unchanged, total annual savings on the fuel account this year and the coming years will be US$16.5 million – a cost reduction which will have a direct impact on the bottom line.

Owned vessels most efficient

Peter Sinding, who heads up the Fuel Efficiency team, explains that the largest savings have been achieved on NORDEN's owned vessels. At the end of 2016, they were 10% more efficient compared to 3 years earlier. In terms of the long-term chartered vessels, efficiency had been increased by 5.4%, while the short-term chartered vessels had increased their fuel utilisation by 1.3%.

At the end of 2016, NORDEN's fleet was made up of 236 dry cargo vessels and product tankers — 37.5 owned, 66.5 long-term chartered and 132 short-term chartered.

"The large difference in fuel efficiency is due to the fact that the more power we have of a vessel — and if we own it, we have the full right of disposal — the more influence we have on how efficiently it is run. This is especially the case when we talk about technical measures such as vessel paint, propeller polishing and hull cleaning. Planned measures are always assessed in comparison to the expected fuel price, so that we know that financially they make sense," says Peter Sinding.

He points out that the increased fuel efficiency has even been achieved during a period of years when NORDEN's fleet on average has aged. Generally, vessels become thirstier with age, and it requires greater efforts to do something about it.

This is how savings are achieved:

- better painting of vessels
- systematic propeller polishing
- cleaning of hull
- more focus on bunker cheating

Everyone must work towards same goal

The first condition for achieving savings on fuel consumption is that the fuel efficiency team receives a correct impression of the vessel's current efficiency level — i.e. before taking action, if at all. It is not a simple task to determine the efficiency of a vessel, because vessels are subject to conditions that change all the time — i.e. speed, draught and weather conditions, which all affect the vessels' consumption considerably.

"Maybe that is exactly why there is something to achieve and the possibility of a commercial advantage," says Head of Fuel Efficiency, Peter Sinding.

Sharing and application of data

The next condition for achieving savings is that the collected data is also being used by the charterers and the operators in NORDEN and Norient Product Pool (NPP), which is in charge of the commercial and operational performance of NORDEN's

product tankers, and by the colleagues in the Technical Department and in Asset Management, the latter being the department that buys and charters vessels for NORDEN.

This has required a lot of meetings and many discussions on which data is relevant in order to carry out the work of reducing fuel consumption as effectively as possible.

"Finally — and maybe most importantly of all — our work in Fuel Efficiency depends on the fact that everyone in NORDEN and NPP participates actively in the work and refrain from suboptimizing on their own area. It is no good if the Technical Department buys bottom paint of a low quality to minimize the immediate operating costs, if the vessel then does not glide as well through the water and increases its fuel consumption. It is no use either if a charterer or an operator avoids having the hull cleaned or the propeller polished on his or her voyage. This may increase earnings on this voyage, but the next will then be more expensive, as it will require more fuel. Fortunately, it is my impression that we are all now good at working towards a shared goal: voyages that are as fuel efficient as possible," says Peter Sinding.

Own set of traffic lights

In order to measure data, share data and take action on data that requires action, Fuel Efficiency has made a set-up which consists of three elements:

- a so-called propulsion module, which makes it possible to continuously measure the efficiency of vessels;
- a set of traffic lights with green, yellow and red lights, which distributes data and identifies where actions are required; and
- seven monthly meetings between Fuel Efficiency, the chartering and operations departments in NORDEN/NPP and the Technical Department

Future measures

So far, fuel efficiency improvements have primarily been achieved through increased hull and propeller effectiveness. Going forward, NORDEN expects large savings especially in two areas achieved through future projects:

- better tools for the selection of vessels for short-term charter; and
- a reduction of the use of the auxiliary engine at sea and in port

NORDEN's Dry Cargo business has decided to increase its operator activities, whereby cargoes are combined with available vessels in the market for a single or just a few trips. It is therefore important to select fuel efficient vessels also for short-term chartering.

NORDEN's port captains play a key role

To NORDEN, it is not only a matter of transporting cargoes from A to B, but also contributing to the entire value chain.

NORDEN has a broad approach to customer service which goes beyond transporting cargoes from A to B. NORDEN is also involved in optimizing local logistics and infrastructure and, in doing so, part of reducing transport costs for the customers and the local society.

This approach to customer service is well in tune with NORDEN's target to contribute to more efficient and sustainable world trade and, thus, increased global wealth. In this respect, it is essential that NORDEN has offices and employees worldwide and is therefore able to combine substantial customer knowledge with local presence and local expertise.

A key role is played by port captains at NORDEN's overseas offices who — with their local knowledge and relations to NORDEN's customers and other business partners, to local authorities, to port agents, to port workers, etc. — are able to co-ordinate a port call from beginning to end in co-operation with operators on shore and the captain at sea. And they do this, regardless of the task or problem at hand, be it cargo hold cleaning, documents, defective loading and discharging equipment, wrong port bookings, cultural differences and barriers or something else completely or unexpectedly.

It signals respect

"When NORDEN engages a port captain in a given port operation, it signals respect for the transportation task which the customer has entrusted us with, and it stresses our seriousness in solving the task in an optimal and professional way. A port captain's physical presence provides the best conditions for it being possible to immediately solve any problems that may arise during the port operation, which is very beneficial to all parties involved," says Port Captain Claus B. Jensen.

He is one of NORDEN's three port captains in the USA, and it is his experience that mistakes and/or misunderstandings in connection with planning the port operations may very well lead to substantial time loss and considerable extra costs for all parties. He therefore always aims at being involved as early as possible in the planning process.

MAIN COMPETENCES OF NORDEN PORT CAPTAINS

- former employment as captains
- professional sparring partners
- flexible problem solvers
- understanding of and experience across cultures
- good at establishing close relationships to customers
- experts in cargo hold cleaning
- optimization of loading capacity and, thus, earnings
- creation of new business through customer assistance

Logistics optimization

The port captains' job is not only to protect NORDEN's interests in an optimal port call.

Port Captain Claus B. Jensen.

"Their job is also to look after the interests of the consignor, consignee and port terminals in order for them to best optimize their logistics after the vessel has arrived and in connection with the cargo delivery to the end customer on land," says head of Dry Cargo Operations at NORDEN's office in Singapore, Senior Operations Manager Stephan Korsgaard.

Head of Dry Cargo Operations at NORDEN's office in Annapolis, USA, Senior Operations Manager Ivan Santos, believes that it simply brings NORDEN's customers peace of mind to know that there is a port captain physically on board a vessel about to load or discharge commodities on their behalf. This is also the case even though the port captain may only follow the operations at a distance by means of telephone/text/email.

Port Captain Søren Retz Johansson.

Used as local expert

"The customers use us as a local expert making their everyday easier. Many of our customers do not have any shipping experience, and loading/discharging operations are an unknown world to them. When NORDEN provides this extra service in the form of port captains, it is very positively received. This is due to the fact that we often solve the problems before they escalate, which is often the case in developing countries. Hellerup, Denmark or Singapore can be far away from the real world in e.g. the Philippines," says Port Captain Søren Retz Johansson, Singapore.

Santos believes that the value of the port captains is directly linked to their experience at sea and their understanding of what takes place on board a vessel — that is from the boatswain to the captain – and their understanding of how to optimize the use of the vessel. And in relation to this, it is not only a matter of knowing how to increase loading capacity and, in doing so, earnings. Port captains must also know how to ensure smooth co-operation on board.

250 years of maritime experience

NORDEN's port captains together represent more than 250 years of maritime experience.

"To this can be added that the port captains know how to behave among people with very different cultural backgrounds. We are also able to think outside of the box, and this yields more flexibility," says Port Captain Claus B. Jensen.

Special logistical projects

Santos points out that NORDEN's port captains are not only used for loading and discharging operations.

"We also offer the assistance of our port captains to key customers when they have special logistical projects in which a port captain could be useful. This could be guidance in connection with new loading and discharging facilities or changes to existing terminals. If they require assistance in solving very challenging maritime operations, a port captain can also assist in this," says the head of operations in Annapolis.

Port Captain Jim Jara.

Ten port captains

NORDEN has a total of nine permanent port captains: three in the USA (Jan Andersen, Jacob Angelbo Christensen and Claus B. Jensen), one in Singapore (Søren Retz Johansson), one in Africa (Samuel Quansah), two in China (Radmund Lu and Eko Zheng), one in India (Bhaswar Purkayastha) and one in Norway, Svalbard (Lars Lundegaard). It also has Port Captain Jim Jara in the Philippines.

In 2016, NORDEN entered into its largest cargo contract so far, which means that NORDEN will transport a total of 20–24 million tonnes of coal from Indonesian mines to a new and modern power plant in the Philippines during the next ten years. This power plant is owned and operated by the Philippine power company GNPower Mariveles Coal Plant Ltd. Co. (called GNPower). The coal is delivered by alternating vessels, but regardless of the vessel, it is always NORDEN's port captain, Jim Jara, who will meet the vessel and coordinate discharge.

"NORDEN's port captain provides GNPower with excellent services. With his vast experience, he contributes to the value creation at GNPower. His knowledge and skills ensure us that the vessels conduct docking and undocking of coal ships in our jetty in a safe and efficient manner. He also gives much-needed advice, which is especially important during rough sea conditions and inclement weather," says Materials Handling Manager Almer C. Domingo, GNPower, in a quote to NORDEN's customer magazine *NORDEN NEWS*.

He adds that Jara also serves as a communicative link between GNPower and NORDEN.

Opens doors for more business

It was Port Captain Søren Retz Johansson in Singapore, who found and recruited the Filipino Jara to handle NORDEN's GNPower operations. Before the ten-year contract, NORDEN transported coal to the power plant for an Indonesian coal producer.

"I travelled to the Philippines in 2014 and discovered that there was a great need for clear instructions to captains, pilots, tugboats, agents, stevedores, etc. I wrote customized mooring instructions, etc. and hired Jim Jara, who is now NORDEN's port captain on location. He makes sure that all parties have peace of mind during discharging operations, and during monsoon season from July to December, his presence, knowledge and experience are particularly valuable. He and I are in daily dialogue," says Johansson.

He and Jara also solve tasks for NORDEN in other parts of the Philippines.

"For instance, we organize courses in safety and optimisation in connection with coal discharging operations, just as we optimize solutions in relation to other power plants with the purpose of obtaining a new long-term contract for NORDEN. This creates goodwill and helps open doors for more business in the Philippines, of which the major ten-year contract with GNPower is a great example," says Johansson.

United Bulk Terminals

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- O&M of material handling systems.
- Logistic Chain Management for ocean, barge and trucking.

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UBT

Making good on the Mississippi

United Bulk Terminals specializes in the handling of coal and petroleum coke and offers a full suite of ground-based service capabilities. Export product arrives via inland barge and is either transferred directly to an ocean vessel or put to storage on a soil cement pad.

The company is also one of the few that can load Capesize vessels. Earlier this year it loaded the Chevrier*, the biggest ship ever in the river, according to the Mississippi river pilots.*

Jay Venter

United Bulk Terminals: flexible, efficient coal and petcoke handling on the Mississippi River

United Bulk Terminals (the Dry Bulk Division of Marquard & Bahls) owns and operates independent dry bulk terminals that offer material handling, storage, blending, screening, crushing, washing and sampling. United Bulk Terminals (UBT) also provides in-refinery services such as sulphur and petcoke handling, petroleum coke cutting, yard management and O&M of material handling systems.

UBT follows Marquard & Bahls' strategy of controlled growth. Benefiting from the global presence and international diversity of the Marquard & Bahls group, it can follow its customers to new markets.

UBT also offers Logistic Chain Management for ocean freight, inland barge services and trucking services.

"In 2015 and 2016 UBT handled on average 7.5mt (million tonnes) of product. We are expecting a decrease in volume of approximately 5% for 2017 due to a reduction in coal shipments," says Fredrik Knutsen, Commercial Manager, United Bulk Terminals USA Inc.

Competitive advantage

Even though the company has competition in the form of three other land-based terminal facilities in the Mississippi River, plus



UBT engineering at work, digging leg fabrication for barge unloader.

two mid-streaming operations, customers use its facilities because its land based terminal has the capability to unload barges at up to 6,000tph (tonnes per hour).

Unlike "midstream" operations, product being direct transferred is sent via the dock system through magnetic separators, and if the customer desires, can be mechanically sampled. The ability to offload and store dry bulk commodities gives customers the flexibility to manage market timing and product blending requirements. In addition, having significant ground storage availability allows vessels to be unloaded and reloaded quickly, minimizing port time and maximizing vessel turns.

"This enables the customers to build up their cargo inventory without demurrage penalties, until it can fill their vessel of choice. It also gives trading houses the option to buy from various piles in UBT's yard — something which is likewise appreciated by producers and traders." explains Knutsen. UBT does provide midstreaming operations for those customer which want flexibility but do not require ground storage.

The company is also one of the few that can load Capesize vessels. Earlier this year it loaded the *Chevrier,* the biggest ship ever in the river according to the Mississippi river pilots (see photo on p29).

"With our flexibility and efficiency we are competitive not only on process, but we are the shortest distance to the customer's destination port."

Operating area for the handling of dry bulk

UBT controls an area of 1,200 acres of land, 300 of which are actively used for dry bulk. Due to a combination of reduction in coal shipments and improved efficiencies, United Bulk Terminals is aiming to reduce its coal and petcoke operating footprint to 150 acres by the end of the year. The area will be re-opened if the demand returns.

In the meantime UBT is looking at diversifying into other commodities. With its advantageous location grain is one commodity that is being pursued.

Equipment & upgrades

UBT's main equipment consists of two stacker/reclaimers, multiple stackers, two barge unloaders, two vessel loaders and a dock mounted gantry crane.

UBT is part of the Marquard & Bahls group, a Germany-based family-owned company characterized by a pioneering spirit and entrepreneurship. Over the decades, the company has grown into one of the leading independent energy supply, trading and logistics companies. For instance, its sister division, Oiltanking, is the second-largest independent operator of tank terminals for oils, chemicals and gases worldwide. In this spirit of entrepreneurial foresight UBT has decided to upgrade all its major infrastructure components (vessel loader, barge unloader, conveyor belts and much more) in its main yard this year. This will boost productivity and system availability, both of which are important for its customers. A new conveyor belt has already been added, to allow for simultaneous loading/unloading in one of its yards. Next are the vessel loader and the barge unloader. Construction has already started for the latter and the vessel loader will follow in the summer.

The company is also scrapping one of its stacker/reclaimers that has been in service since 1984. It replaced its 1964 stacker/reclaimer in 2012.

To ensure a smooth design and construction process UBT developed an engineering team last year, comprising eight colleagues with vast mechanical, structural and electrical engineering expertise. The team also supports day-to-day operations, which is a strong selling point for its customers when it comes to system sustainability and quality assurance.

Commodities/products handled & services

UBT's equipment is capable of handling the majority of dry bulk materials, but it traditionally concentrates on coal and petroleum coke.

The company adds value to its services primarily by offering blending and quality assurance services like sampling to its customers, most of which, for instance, mid-streaming companies cannot provide. Moreover, its extraordinary storage capacity of up to 3.5mt plays a vital role in supply chain assurance for some of the leading utility companies in the US.

Through its affiliate, United Ocean Chartering, it also provides full logistics chain management, including the handling of trucks, inland and ocean-going vessels as well as the chartering of cargo ships in the US Gulf.

UBT has always catered to its customers' needs, which requires increasingly flexibility to customize products to customers' requirements, quality assurance, and supply chain security.

Performance tracking

In order to keep its productivity at optimum levels, Mr Knutsen explains that the company uses various defined key performance indicators (KPIs), like tonnes per hour (tph), equipment availability (in minutes) and many more to measure and further improve productivity.

"Keeping in mind that we are one of the busiest terminals in the region, our productivity certainly is competitive," says Knutsen.

"The aforementioned major infrastructure upgrades will allow for further productivity gains later his year. For instance, our in-house engineering team has just finished designing a barge dewatering system tailor made to our needs. With this system we will be able to discharge barges at normal speed, even if cargo is excessively wet."

Port of Louisiana encouraged by President Trump's priority project list

Globalplex bulk cement domes.

Deepening the Mississippi River a Priority For Louisiana and the Nation

As an advocate of deepening the Mississippi River, a critical element to unencumbered movement of cargo and the success of Louisiana's — and the nation's (United States of America) — economy, Port of South Louisiana Executive Director Paul Aucoin travelled to Washington, DC last month to meet key stakeholders, including Dan Slane, a key member of President Trump's transition team. Today, Slane is serving in the White House as Deputy Director, Infrastructure at the National Trade Council. In the meeting with Slane, Aucoin and Slane discussed issues affecting the Port of South Louisiana, including, and most importantly, the dredging of the Mississippi River. "I stressed...that ensuring the river is open for business will stimulate impressive economic growth and generate thousands of good paying jobs for working Americans," said Aucoin. It is not just an issue affecting Louisiana; states are dependent on the mouth of the river being properly dredged. It is also a matter of national security. "As a country, the Mississippi River is one of our most valuable resources and we must take steps to ensure its continued reliability."

President Donald Trump has released a list of 50 "Emergency and National Security Projects," totalling $317.5 billion in investment and touting the creation of over 193,000 jobs. The list includes three Louisiana projects, one of which is the dredging of the Mississippi River. Projects on the list had to be deemed (a) a national security or public safety "emergency," (b) "shovel-ready," with at least 30% of initial design and engineering work complete, (c) a direct job creator, and (d) a project with the potential for increased US manufacturing.

Although Congress authorized a 50-foot channel depth in 1985, the project was never properly funded. While ports on the east coast have been adequately deepened to 50 feet to accommodate today's deep-draught vessels, the lack of attention to the Mississippi River channel continues to negatively affect ports and the industries that lie upon the largest waterway in the nation.

Today, Aucoin is pleased President Trump is listening and prioritizing this project. As project seven on the list, ranking highest of the three Louisiana projects included, it is catalogued at a cost of $1 billion that would create 200 direct jobs. "I know it's early on in the process," Aucoin says "but I am encouraged that Trump's administration will keep this project on the forefront and will urge Congress to approve it."

The release of this list and the inclusion of its essential undertaking seems to echo President Trump's promise to revitalize the nation's failing transportation infrastructure.

Bulk Facility

Globalplex Intermodal Terminal's deep-draft bulk terminal is dedicated to handling materials including, but not limited to, cement, mineral ores, and woodchips. The bulk dock is 44 × 570 and is equipped with upstream and downstream mooring buoys, allowing dockage of Panamax-class vessels.

Bulk handling equipment includes a 1,200tph (tonnes per hour) shiploader, a Manitowoc 4,600 swing crane with hopper, an upgraded bulk commodities conveyor system capable of running up to 2,500tph, and an 800tph Carlsen screw-type unloader for special handling of cement.

The cement facility, which includes dome storage, is one of the largest in the United States. Cargo is quickly moved to and from landside storage via an extensive covered conveyor system.

About the Port of South Louisiana

The Port of South Louisiana is a 54-mile port district on the Mississippi River between New Orleans and Baton Rouge, encompassing the parishes of St. Charles, St. John and St. James. The facilities located within the port's district consistently handle over a quarter billion short tons of cargo annually, ranking it the largest tonnage port district in the Western Hemisphere, the nation's greatest grain exporter, and the number one energy transfer port in the United States. Along the 108 miles of deep-water frontage on both banks of the river there are seven grain transfer facilities, four major oil refineries, 11 petrochemical manufacturing facilities and several other facilities for a total of more than 50 docks owned and operated by an impressive group of resident tenants such as ADM, ArcelorMittal, Dow, Cargill, DuPont, Motiva Enterprises, Marathon, Shell, Nucor Steel., Occidental, Valero, and Occidental Chemical.

Associated Terminals: servicing the Lower Mississippi

Serving the Lower Mississippi River and beyond, Associated Terminals offers a scope of services, including midstream operations, terminal port operations, in-plant services, logistical solutions, general cargo/warehousing and agricultural commodity exports. Whether it is along the US Gulf or elsewhere, the company will examine the need of its existing or potential customers and bring its scope of services where there is a need.

Services

Associated Terminals provides a comprehensive range of value-added services, which allows it to offer complete cargo movement solutions for its customers. The scope of facilities and assets offered by Associated Terminals includes offering dry bulk, breakbulk and project cargo shippers an extensive range of services, including the total coordination of movements to provide customers with a comprehensive transportation and stevedoring package.

Assets & facilities

Associated Terminals' locations and facilities include the Port of St. Bernard/Chalmette Slip, the Port of South Louisiana/ Globalplex, St. James Parish, the Port Manchac Intermodal Terminal, the Port of Baton Rouge/Port Allen and the Myrtle Grove Midstream Terminal. These facilities represent the total commitment Associated Terminals have made to provide its customers with the most dynamic logistical solutions and cargo handling in its industry. From its deep-draught berthing locations to its diverse range of cargo handling options, its 900,000 square feet of covered warehousing space and much more, Associated Terminals has the resources to handle its customers' unique needs safely and efficiently.

Myrtle Grove / MGMT

Associated Terminals operates the Myrtle Grove Midstream Terminal — a floating grain elevator specializing in the transfer of grain and grain byproducts between barges and ocean vessels. Located at mile post 56.8 A.H.P. on the Lower Mississippi River, this terminal offers vessels the advantage of providing the shortest transit time from the Gulf of Mexico.

Port of St. Bernard

Offering an ideal location, deep draft berths and intermodal facilities, the Port of St. Bernard is a full-service marine terminal.

Associated Terminals is the exclusive operator of the port's marine facilities, which offer a wide range of berthing options and cargo handling solutions for bulk, breakbulk and project cargo, including truck and rail loading and unloading, warehousing and storage, bagging capabilities and screening/processing services.

Port of South Louisiana/Globalplex

Associated Terminals' Globalplex Intermodal Terminal is located at the Port of South Louisiana — the largest tonnage port in the western hemisphere.

Convent

AssociatedFrontConvent is the site of Associated Terminals' headquarters and technology center. This site is located in the centre of one of the most highly industrialized areas on the Lower Mississippi River.

Port Allen

Associated Terminals owns and operates an intermodal terminal in the Greater Baton Rouge area — providing effective cargo handling solutions to meet the specific needs of its customers. Located on the Intracoastal Canal in Port Allen at mile post 229 A.H.P., this facility is focused on the efficient transfer of cargo between barge, truck and warehouse storage.

Port Manchac

Port Manchac is an inter-modal facility that serves manufacturing and distribution clients throughout the Gulf South.

The port is ideally located-the Canadian National (CN) Railroad's north-south main line runs directly adjacent to the port's property and provides regular service to the facility as needed.

Gottwald cranes

All of Associated Terminals' facilities are served by its fleet of modern, high capacity floating Gottwald cranes. With 14 of the most technologically advanced cranes in the world, Associated Terminals is able to offer advantageous options to its customers.

Safety

As an industry leader in safety, Associated Terminals is committed to conducting operations in a manner that ensures the well-being of its people, minimizes impact on the environment and reduces exposure and risks to physical assets.

The focus of Associated Terminals' safety programme is driven by ensuring that all employees are trained for the specific tasks they perform. To that end, Associated Terminals offers an extensive training programme that goes beyond standard training practices — as well as a Safety Management System and a comprehensive HSE Policy to which all employees must adhere. In addition, Associated Terminals has instituted Stop Work Authority that allows any employee to stop operations in the event that unsafe working conditions are detected.

When it comes to safety, Associated Terminals is very proactive. It conducts regular audits to identify and correct potential problems. In addition, Associated Terminals has developed a comprehensive safety manual; it conducts regular maintenance on all equipment to ensure safe operation; and it requires all employees to undergo drug screenings.

With one of the most comprehensive Health, Safety and Environmental programmes in the industry, Associated Terminals has made a strong commitment to making safety a top priority throughout its entire company each and every day. DCi

Excellence is ASSOCIATED with US.

When it comes to the movement of bulk, breakbulk and project cargo along the Lower Mississippi River, turn to Associated Terminals. We have assembled a team of experts and invested in modern facilities, equipment and related assets to best service your cargo shipping needs. Add to that our total commitment to safety and it is easy to see that Associated Terminals is an excellent choice for all of your cargo handling and logistical solutions.

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CASE reveals winning entries from livery-design competitions

Two competitions, for leading European design schools and members of the public, have produced stunning new vehicle liveries which complement styling by CNH's Industrial Design Centre.

During its Paris launch of its new G Series wheel loaders on 20 March this year, CASE Construction Equipment revealed three striking new vehicle liveries. The new designs were created through three different channels of engagement: the CNH Industrial Design Centre, a competition for leading European design schools, and a Facebook competition for members of the public.

Winning 'hands-on' design from Edoardo Vetere and Luca de Maria at the Istituto d'Arte Applicata e Design.

All three liveries were on show in March at the CASE Customer Centre in Paris. The two competition-winning designs overlay the new, official CASE livery that was announced in January. This new livery features a dark grey colour on the lower part of the machines with reflective white colouring above, 'CASE' lettering in the same font as the brand logo, and a new 'Power Abe' metallic badge.

Design college's winning livery takes 'hands-on' approach

Six eminent European design schools were invited by CNH Industrial to submit liveries for the new G Series wheel loaders: L'École de design Nantes Atlantique (Nantes, France), Glasgow School of Art (Glasgow, Scotland), Istituto d'Arte Applicata e Design (Turin, Italy), Istituto Europeo di Design (Turin, Italy), Politecnico di Torino (Turin, Italy), and Umeå Institute of Design (Umeå, Sweden).

The design school students were asked to strive for originality while also capturing CASE brand values of heritage, people and passion, hands-on, and problem solving. The winning design came from Edoardo Vetere and Luca de Maria at the Istituto d'Arte Applicata e Design (IAAD). They emphasized CASE's 'hands-on' brand value by painting a giant yellow hand on the wheel loader's rear bodywork against a contrasting background of graphite gray-black. T he students explained, "Hands-on is a symbol celebrating the importance of hard work, the foundation of every great deed."

Laura Milani, IAAD Director and CEO, commented: "Sharing skills to transform ideas into realizable projects is the heart of what happens every day at IAAD. The students at the Academic Course in Communication and Transportation design have worked together to create a brief, able to comply effectively with the requirements of the CASE WL Graphic Talent competition organized by CNH Industrial. Creativity, method and professionalism have won: it is in the relationship between these elements that the meaning of design and designers lie.

"We are very proud that IAAD students have won this competition. Challenges like this are directly relevant to our students' ambitions and help them develop a good understanding of a company's real-world needs. Seeing the livery in full-size on the CASE G Series wheel loader will be a big thrill!"

The prize for the winning entry is a paid internship and scholarship at CNH's Industrial Design Centre, which will help students launch their professional career.

Public Social Media competition winner is cleverly humorous

The public competition was opened on Facebook last November to residents of France, Germany, Italy, Spain and the UK. CASE gave the same advice about CASE brand values to all entrants. The winner is Stefano Scardovi, from Ravenna, Italy. His livery features an elephant, which suggests the wheel loader's robustness and load-lugging ability. The lower part of the elephant's trunk is painted on the vehicle's bodywork and the upper part of the trunk is formed in three dimensions by the vehicle's curved exhaust pipe.

Scardovi was invited to see his livery on a new G Series wheel loader at the wheel loader launch.

Expert judges impressed by entrants' creativity

The judging panels of both design competitions were headed by the Director of the CNH Industrial Design Centre, David Wilkie. As a graduate of the Charles Rennie Mackintosh School of Art in Glasgow, with a specialization in Industrial Design, and holder of a Postgraduate Master's Degree in Automotive Design from the Royal College of Art in London, David recalls how important it is to encourage students to combine free-thinking creativity with real-world considerations.

Wilkie said: "We were genuinely impressed by the quality of the entries. They showed great imagination, creativity, and enthusiasm for CASE's products. The best designs combined a sense of fun with strong visual clues about product character."

Public Social Media competition winnder Stefano Scardovi, from Ravenna, Italy, opted to use an elephant to suggests the wheel loader's robustness and load-lugging ability.

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Industrial processes produce a large amount of pollutants in various forms — particles, gases, vapours and mists — many of which are toxic or explosive. Now, with regulations becoming increasingly stringent, reducing production-related pollution is an environmental and legal must-have.

For more than 90 years, AAF International has been providing clean air solutions for power and industrial processes around the globe. AAF's reputation for developing quality products and innovative solutions dates back to 1921, throughout its rich history the company has pioneered many of the techniques used today to control airborne dust, fume and vapour.

AAF International manufactures complete systems, from dust collection to clean air outlet transition, for industries like metalworking, food processing, pharmaceutical and chemical. AAF works very closely with customers to supply air filtration systems that meet their specific needs so as to comply with the strictest environmental regulations and facilitate their processes. AAF has extensive experience in manufacturing tailored dust collectors for fertilizer including phosphate, nitrogen, potassium and sulphur. With dust removal being of critical importance to the fertilizer industry, AAF has installed several dust collectors in leading international companies.

Case study: phosphate rock plant which manufactures superphosphates (SSP, TSP) and ammonium phosphates (MAP, DAP)

AAF supplied a dust collection system to help its client to protect its employees and belt conveyors from fine particles emitted during phosphate transportation from storage areas to ship loading areas. The process starts by sending ground phosphate rock from the mines to recovery units to separate sand and clay and to remove impurities. Belt conveyors carry phosphate from one process to the next. The phosphate is stocked in four storage facilities then routed to transfer towers via belt conveyors, from there it is dispatched to be loaded onto ships (2,000 tonnes per hour).

AAF's custom designed clean air solution consisted of 16 FabriPulse Fusion FPF 12-176 baghouse filters (four per hall). These dust collectors were installed to capture dust at transfer points and chutes – during phosphate spill to trippers and its discharge on belt conveyors.

AAF baghouse filters have provided a healthy and safe work environment for the clients' employees. They have also enhanced belt conveyors efficiency and extended their lifetime. Moreover this de-dusting solution has enabled the client to comply with environmental standards.

Sulphuric acid case study

Another case study of a solution offered by AAF to one of its clients is in the sulphuric acid field, the world's most widely used chemical. This compound is an essential intermediate many processes in the chemical like phosphate fertilizer production. The process starts burning liquid sulphur to obtain sulphur dioxide (SO_2) which is subsequently converted into SO_3. Sulphuric acid is obtained by the absorption of SO_3 into H_2SO_4.

AAF tailor-made clean air solution consisted of a two-stage static housing: first stage was composed of louvers and pre-filters; the second stage was made of DriPak F5 pocket filters as final filters.

The filter housing captures dust from outdoor air, the filtered air is then dried with concentrated sulphuric acid via a counter-current flow in the drying tower to remove water vapour. Indeed major changes were made in the sulphuric acid process to maximize energy recovery and use heat to generate high pressure steam or electricity. This solution has enabled the plant to operate at its peak performance and to maximize the production output.

AAF International's product portfolio also includes a wide range of filters and replacement parts that ensure superior filtration efficiency (cartridges filters, bag filters) and field services from maintenance, refits and upgrades. The company today continues to invest thousands of hours in the research and development of new products to embrace the challenges provided by modern industrial processes. This ensures the delivery of the most cost effective and energy efficient products available in the market today.

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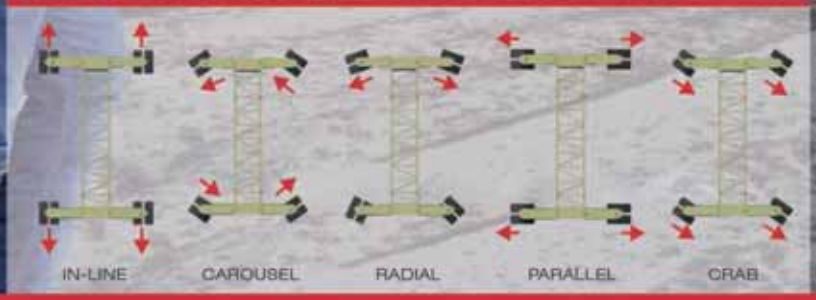

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ASGCO® introduces Semi-Ceramic pulley lagging

Newly improved ceramic tile corrects belt slippage and premature wear.

ASGCO® has added a Semi-Ceramic™ Pulley Lagging to its pulley lagging product line, featuring 40% coverage. The addition of this Semi-Ceramic Lagging allows the company to offer a semi-ceramic product range to provide customers with a choice between full ceramic coverage with its Arrowhead® Ceramic Pulley Lagging for high tension drive pulleys, as well as less than full ceramic coverage with its new Semi-Ceramic™ Lagging for smaller pulleys, non-drive pulleys and bend pulleys. ASGCO®'s Semi-Ceramic Pulley Lagging provides the solution when conventional rubber lagging fails to correct belt slippage and wears prematurely.

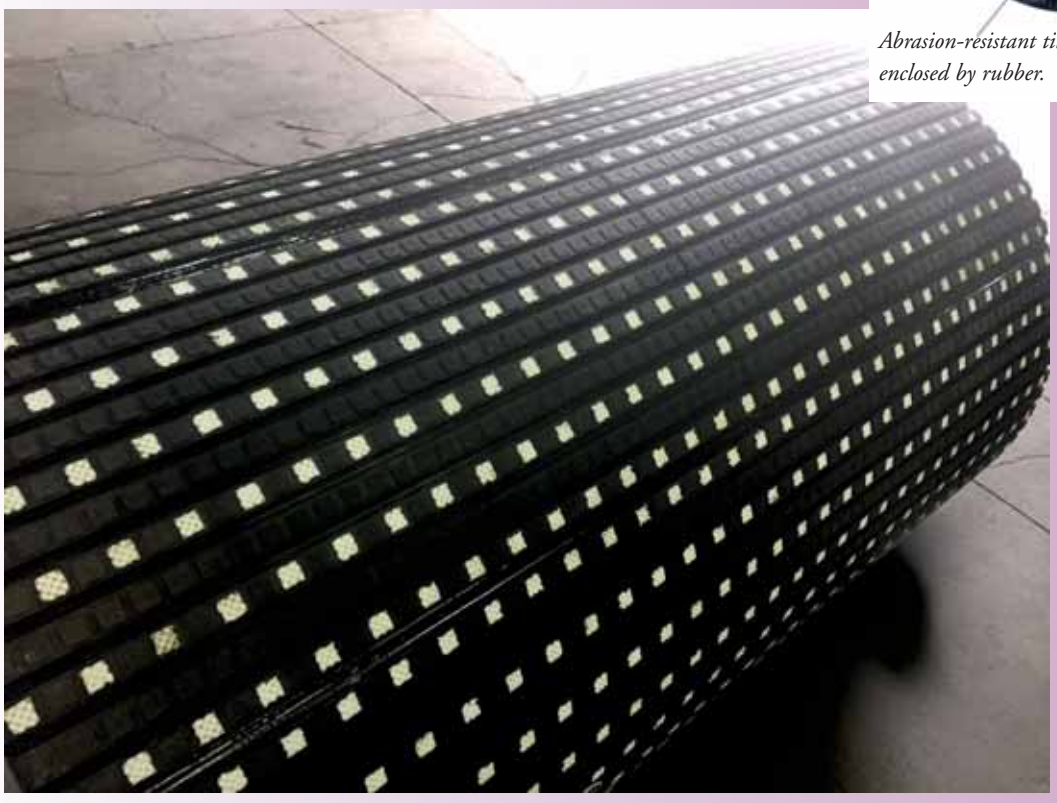
The ceramic tiles are embedded in rubber on all sides and separated by a horizontal groove for dispelling water and dirt. ASGCO®'s pre-chemical backing provides an exceptional bond for rubber-to-metal applications.

ASGCO®'s Semi-Ceramic™ Lagging is supplied in 15 inch (385MM) wide X 32.81 foot (10M) rolls for full versatility, so customers can use only what is needed.

Features and benefits

- ❖ newly improved ceramic tile — provides robust performance in dry, wet, or muddy applications;
- ❖ high grade — aluminium oxide ceramic;
- ❖ bonding strength — that is superior to others, due to 3mm of ASGCO®'s neoprene compound vulcanized into bottom-side of the lagging;
- ❖ pre-chemical backing — for ease of installation;
- ❖ increased productivity — by delivering increased traction between the conveyor belt and pulley, allowing for lower belt tension than with rubber lagging;
- ❖ reduced downtime — on non-drive pulleys, where pulley change-out due to excessive wear is difficult; and
- ❖ rounded corners — allow for better adhesion between the rubber and the tile.

Abrasion-resistant tiles fully enclosed by rubber.



GENMA wins contract to supply three mobiles cranes to Paradip Port in India

GENMA has recently been awarded a contract by J. M. Baxi group in India to supply three GHC100 mobile cranes for Paradip Port. J. M. Baxi & Co, established in 1916, is a leading Indian shipping services company, and almost synonymous with the shipping industry in India. One of its subsidiaries, Paradip International Cargo Terminal Pvt. Ltd., is responsible for sourcing versatile cargo handling equipment to be used at a clean wharf at Paradip Port.

This wharf has a depth of 17.1m, and is 450m long. It can handle vessels of up to 125,000dwt. The main cargoes are steel, aluminium blocks, chemical fertilizers, grain, sugar etc. Mobile harbour cranes are the ideal equipment for the operating conditions at the wharf. There were several competitors for this contract, including some of the top players in the market. After several rounds of co-ordination and on-site performance checks on some of GENMA's installations, GENMA stood out from the competition with the proof of the high efficiency and customizability of its equipment.

The final contract is for three GHC100 mobile harbour cranes, with capacities of 100t, with a working radius of 1,048m.

GHC100 at MIP, Myanmar.

Previous GENMA mobile harbour crane installations

To date, GENMA's mobile harbour crane sales total nine units, including these three units, ranging from 63t to 200t. The travelling mechanism includes rubber-tyred and rail-mounted types.

About GENMA

The brand GENMA belongs to Rainbow Heavy Industries (RHI), which mainly provides material handling solutions. Aside from its expertise in container handling solutions, GENMA is also GENMA wins contract to supply three mobile cranes to Paradip Port in India expanding broadly in the bulk handling business.

The main products supplied by GENMA include: mobile harbour cranes; pneumatic ship-unloaders; bridge-type grab ship-unloaders; scraper ship unloaders; chain bucket ship-unloaders; mobile shiploaders; and environmental hopper etc.

The headquarters of GENMA is located in Shanghai, China. The manufacturing, technology and R&D centres are in Nantong, China. To better serve customers, GENMA has set up sales and service contact offices in Singapore, India, Belgium and Canada. Besides that, its agents in Asia, Africa, South America and Middle East can also provide a quick response service.

GENMA's methodology is to help multi-industry clients benefit from its service.

ArcelorMittal places its faith in AUMUND equipment once more

Once again, ArcelorMittal is counting on the strengths of the LOUISE-type AUMUND drag chain conveyor

1998: AUMUND drag chain conveyor, type LOUISE TKF, in ArcelorMittal's João Monlevade plant in Brazil (photo AUMUND).

Steel maker ArcelorMittal is building on proven solutions and reliable partners in Brazil. About 20 years ago, a shock-pressure-proof drag chain conveyor was ordered for Brazil from LOUISE Fördertechnik, before this company was acquired by AUMUND Fördertechnik GmbH. Now, AUMUND has won an order for another drag chain conveyor, type LOUISE TKF. The shock-pressure-proof design of its predecessor was no longer required for the new model because of the change in classification of the plant segment. The dispatch of the machine is planned for June 2017.

The earlier model drag chain conveyor was ordered in 1998 by the then Brazilian arm of the Luxemburg steel company Arbed, CSBM, Companhia Siderurgica Belgo Mineira. Arcelor was created by the merger of Aceralia and Usinor and merged with Mittal in 2006 to become ArcelorMittal, the world's leading steel concern.

Around 15 years ago, AUMUND Fördertechnik GmbH integrated the products of the LOUISE subsidiary into its own portfolio. This double-strand drag chain conveyor with a capacity of 3kW, a centre distance of 10.4m and a performance of 25tph (tonnes per hour), will be used for bunker extraction.

The previous machine proved its durability in an interesting way. One of the supports of a weighing cell collapsed and caused one side of the silo to subside. A large portion of the fallen steelwork weighing several tonnes was resting on the discharge conveyor. If it had not been for the strength of this machine, the silo may well have collapsed completely, and the damage would have been far more extensive. "It is of course not the usual method by which we test the quality of our machines!" remarks Ingo Dietzold, Managing Director of AUMUND do Brasil in São Paulo.

ArcelorMittal Brazil boasts 11,000 employees spread over 27 manufacturing and administration sites, and has a production capacity of 11.3mt (million tonnes) of steel and 7.1mt of iron ore.

About the AUMUND Group

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

SENNEBOGEN's new sales structure in Estonia, Latvia and Lithuania

From 1 April this year, SENNEBOGEN has changed its distributor network in the three Baltic countries. ScanBalt Crane now represents SENNEBOGEN in the area, a decision that was made since the companies have been co-operating since 2001.

In recent years ScanBalt Crane has established an excellent product knowledge and service back up. At the same time, ScanBalt Crane kept developing its service team as well as its sales structure in Latvia and Lithuania. Thanks to its extensive experience, ScanBalt Crane will add additional value to SENNEBOGEN's 'GreenLine' products and intensify the market development for SENNEBOGEN in all three Baltics states.

SENNEBOGEN is grateful to its previous dealer, Konekesko, for all that it has achieved over the year. Service and spare parts are now available from ScanBalt Crane.

With its extended product range SENNEBOGEN offers solutions to any material handling task with machines in the size of 11–300 tonnes own weight.

The SENNEBOGEN machines are purpose built for industrial three-shift operation and are well known for their reliability and easy service access. Lowest cost of ownership is always in the focus when developing new products. With the huge range and variety of solutions such as electric motors, equilibrium balanced machines SENNEBOGEN is one of the main suppliers for the material handling industry worldwide.

The SENNEBOGEN Group — with its production facilities in Germany and worldwide distributors — is still 100% family owned, which allows it to continuously adopt the existing products and design new models according to customer demand.

ScanBalt Crane OÜ is an enterprise founded in the year 2000 that sells, leases out and provides maintenance for material handling machines, cranes and their additional devices. The company has sold a substantial amount of material handling machines and devices in Estonia, Latvia and Lithuania.

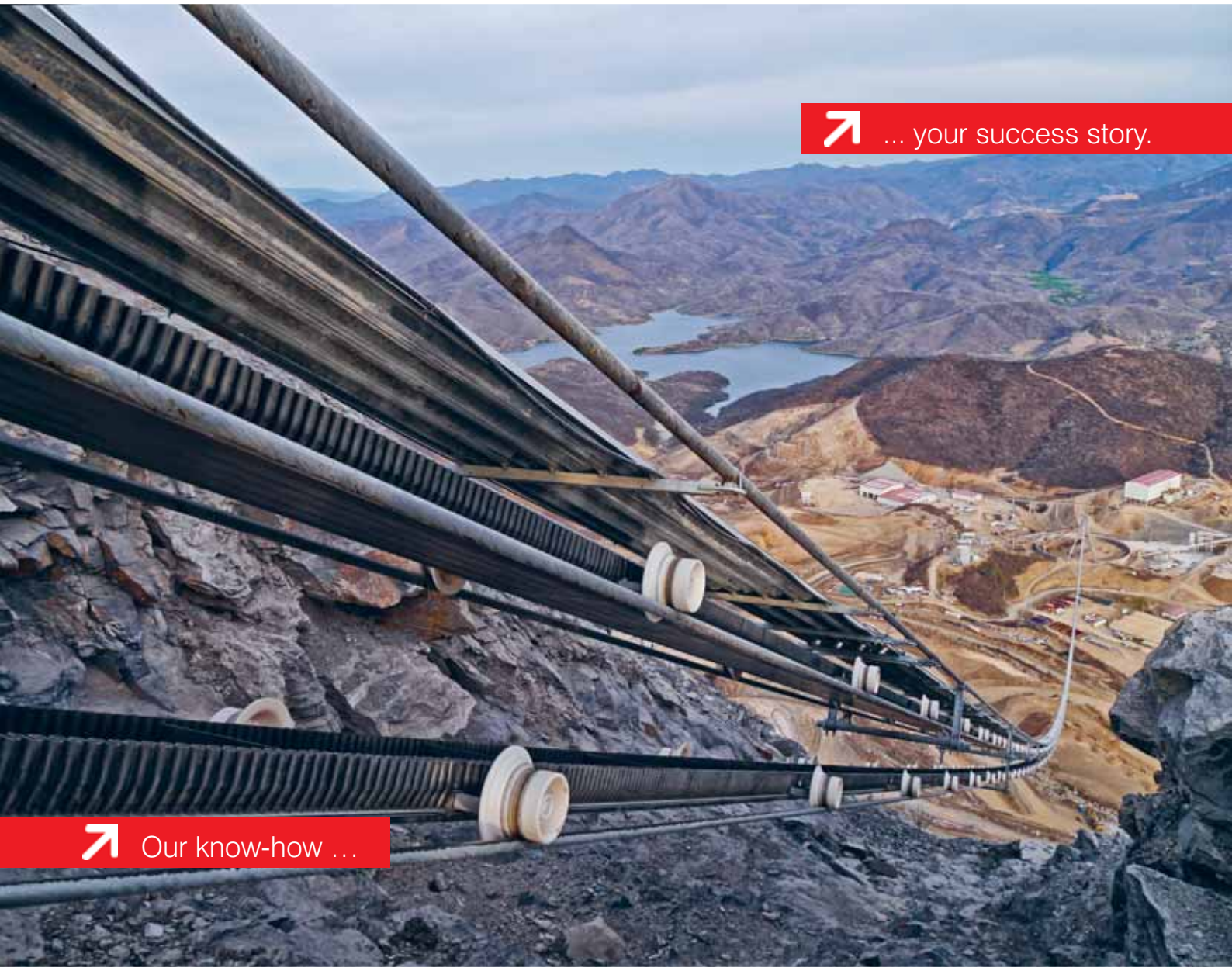
Working closely together with its sister companies of loading and stevedoring services and with long time partner SENNEBOGEN, ScanBalt Crane can offer ideal solutions to customers in need for material handling machines.

RopeCon®
The Innovation in Bulk Material Handling

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

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

www.doppelmayr-mts.com



Doppelmayr Transport Technology GmbH, Konrad-Doppelmayr-Strasse 1, 6922 Wolfurt / Austria, T +43 5574 604 1800, dtt@doppelmayr.com

Successful start-up of RopeCon® to transport limestone

The successful start-up of a RopeCon® system which will transport limestone from the quarry to the area where it will be processed has recently taken place in Guatemala, approximately 35km from the capital. The installation, which requires no more than four tower structures to cross a wooded terrain, has a length of approximately 1.6km and covers a vertical rise of almost 200m. Thanks to the long rope spans, it has been possible to minimize the amount of space required on the ground. The cement plant of Guatemalan Cementos Progreso, S.A. is due to begin operations in the first half of year 2017. From then on, the RopeCon® will transport 2,100 tonnes of material every hour.

RopeCon® has been developed and designed by the Austrian ropeway manufacturer Doppelmayr and combines the features of a belt conveyor with those of a ropeway, thereby making use of the advantages of both technologies. It is currently in use for a variety of material transport applications all over the world.

Correction: November 2016 issue

On pp87–88 of the printed version of the November 2016 issue of *Dry Cargo International*, we included two photographs that, we now learn, are the property of major dome manufacturer Dome Technology, and depict Dome Technology projects.

These photographs were used without authorization from Dome Technology, and the company has expressed concern that their placement will mislead readers about their provenance, and about Dome Technology's business.

We would like to apologize unreservedly for the unauthorized use of these photographs, and for any potential embarrassment caused to Dome Technology.

About Dome Technology

Dome Technology is a pioneer in dome storage solutions that can outperform traditional silos and flat storage. For more than 35 years, the company has been building domes that last longer, hold more, and move more product than other bulk-storage options on the market.

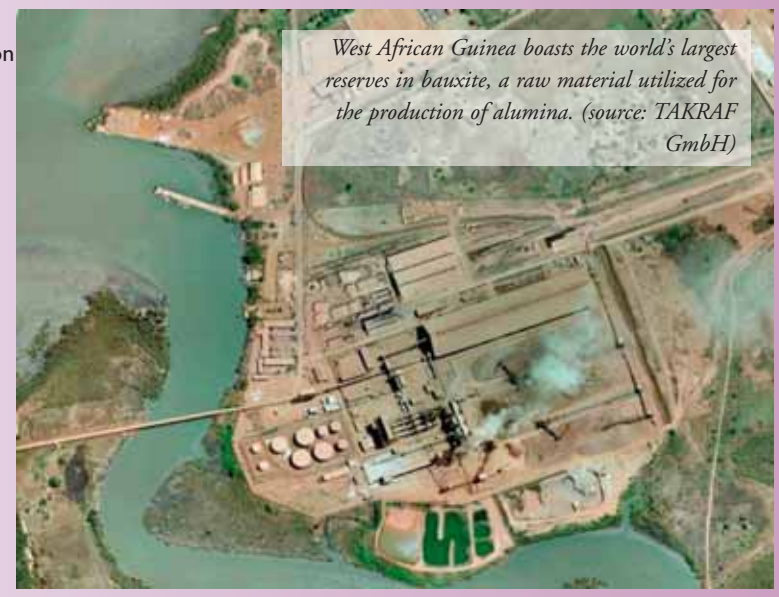
Dome Technology is able to handle a very wide range of projects, from a 100m-wide molybdenum bulk storage dome for the Climax Molybdenum Mine in Colorado to a pair of iron ore dome silos reaching 41m tall for the Cliffs Natural Resources Iron Mines in Quebec.

TAKRAF awarded major contract in Africa

TAKRAF GmbH, a Leipzig based company with a wealth of experience in development, design, fabrication, erection and commissioning of equipment and systems for the global mining and material handling industry, has secured a major contract for the turn key supply and installation of a bauxite handling plant in Guinea, West Africa. The contract value is approximately € 100 million.

TAKRAF, with roots dating back to 1725 and with more than 1,000 employees worldwide, is affiliated to TENOVA spa, a technology-based group of companies based in Milan, Italy, which in turn belongs to the Italian engineering company TECHINT, a leading integrated supplier of technology and turnkey industrial plants.

Guinea, situated on the west coast of Africa, boasts the world's largest reserves in bauxite, a raw material utilized for the production of alumina, which is used in the smelting of aluminium, a metal important in the aviation industry, automobile fabrication, and many more durable goods manufacture.



West African Guinea boasts the world's largest reserves in bauxite, a raw material utilized for the production of alumina. (source: TAKRAF GmbH)

Compagnie des Bauxites de Guinée (CBG), jointly owned by the international mining houses ALCOA, RIO TINTO, DADCO and the State of Guinea, mines and exports bauxite for more than 50 years and has put in place an ambitious programme to increase their export capacity, for which TAKRAF supplies equipment for the unloading of rail wagons and crushing and conveying of the bauxite. A major challenge is the brownfield character of the works, which means that the new supplies and modifications to the existing plant have to be carried out whilst the installation is in operation. Very limited plant downtime and difficult conditions for logistics are a further challenge.

The contract value of the installation is approximately € 100 million. A major challenge for TAKRAF is reconstructing the plant whilst the installation is in operation. (source: TAKRAF GmbH)

TAKRAF is executing this contract in close cooperation with their subsidiaries in the USA, China and South Africa, whereas the project lead is based in Leipzig, Germany. TAKRAF's CEO Dr. Frank Hubrich underlines the importance of this project for the implementation of the company in the important markets in western Africa and praises the good co-operation between the different entities of the company. The commissioning of the plant is scheduled for the second half of 2018.

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.

As part of an ambitious program to increase the export capacity, TAKRAF supplies and installs equipment for the unloading of rail wagons as well as crushing and conveying of bauxite. (source: TAKRAF GmbH)

E-HANDLER® by E-CRANE

"The E-Crane system has ***cut our unloading time in half***, cut our maintenance time dramatically, and just ***generally simplified our lives*** and r***educed our costs*** substantially".

Tom Noble, Department Supervisor, Powersouth Energy

See Why it ALWAYS has been @ E-CRANE.COM !

1. **SHORT DELIVERY TIME**
   Lead time as fast as 3-4 months ex-works
2. **132 Kw ELECTRICAL MOTOR**
   Save money with low energy costs
3. **VERSATILITY**
   Free Standing, Crawlers, Floating, Rail

"WHITE is the New Green"

AAF clean air solutions for the fertilizer industry

Industrial processes produce a large amount of pollutants in various forms – particles, gases, vapours and mists – many of which are toxic or explosive. Now, with regulations becoming increasingly stringent, reducing production-related pollution is an environmental and legal must-have.

For more than 90 years, AAF International has been providing clean air solutions for power and industrial processes around the globe. AAF's reputation for developing quality products and innovative solutions dates back to 1921, throughout its rich history the company has pioneered many of the techniques used today to control airborne dust, fume and vapour.

AAF International manufactures complete systems, from dust collection to clean air outlet transition, for industries like metalworking, food processing, pharmaceutical and chemical. AAF work very closely with customers to supply air filtration systems that meet their specific needs so as to comply with the strictest environmental regulations and facilitate their processes. AAF has extensive experience in manufacturing tailored dust collectors for fertilizer including phosphate, nitrogen, potassium and sulphur. With dust removal being of critical importance to the fertilizer industry, AAF has installed several dust collectors in leading international companies.

AAF FabriPulse® baghouse filter.

Case study of a phosphate rock plant which manufactures superphosphates (SSP, TSP) and ammonium phosphates (MAP, DAP).

AAF supplied a dust collection system to help its client to protect its employees and belt conveyors from fine particles emitted during phosphate transportation from storage areas to ship loading areas. The process starts by sending ground phosphate rock from the mines to recovery units to separate sand and clay and to remove impurities. Belt conveyors carry phosphate from one process to the next. The phosphate is stocked in four storage facilities then routed to transfer towers via belt conveyors, from there it is dispatched to be loaded onto ships (2,000 tonnes per hour).

AAF's custom designed clean air solution consisted of 16 FabriPulse Fusion FPF 12-176 baghouse filters (four per hall). These dust collectors were installed to capture dust at transfer points and chutes — during phosphate spill to trippers and its discharge on belt conveyors.

AAF baghouse filters have provided a healthy and safe work environment for the clients' employees. They have also enhanced belt conveyors efficiency and extended their lifetime. Moreover this de-dusting solution has enabled AAF's client to comply with environmental standards.

Another case study of a solution offered by AAF to one of its clients is in the sulphuric acid field, the world's most widely used chemical. This compound is an essential intermediate many processes in the chemical like phosphate fertilizer production. The process starts burning liquid sulphur to obtain sulphur dioxide (SO_2) which is subsequently converted into SO_3. Sulphuric acid is obtained by the absorption of SO_3 into H_2SO_4.

AAF tailor-made clean air solution consisted of a two-stage static housing: first stage was composed of louvres and pre-filters; the second stage was made of DriPak F5 pocket filters as final filters.

The filter housing captures dust from outdoor air, the filtered air is then dried with concentrated sulphuric acid via a counter-current flow in the drying tower to remove water vapour. Indeed major changes were made in the sulphuric acid process to maximize energy recovery and use heat to generate high-pressure steam or electricity. This solution has enabled the plant to operate at its peak performance and to maximize the production output.

AAF International's product portfolio also includes a wide range of filters and replacement parts that ensure superior filtration efficiency (cartridges filters, bag filters) and field services from maintenance, refits and upgrades. AAF continues to invest thousands of hours in the research and development of new products to embrace the challenges provided by modern industrial processes. This ensures the delivery of very cost effective and energy efficient products.

Alum SA Tulcea Romania optimizes production with a BWZ-type AUMUND bucket elevator

Alum SA Tulcea of Romania took delivery of a new central chain bucket elevator type BWZ from AUMUND Fördertechnik GmbH in April 2017. The new 100tph (tonnes per hour) bucket elevator will be used in the production process to feed calcined aluminium oxide into the silo. The installation of the new bucket elevator will enable the plant operator to dispense with a machine previously purchased from another manufacturer which is no longer performing.

Alum Tulcea runs the only aluminium refinery in Romania. It is situated on the Ukrainian border, and produces on average 600,000 tonnes per year of calcined aluminium oxide, which is used in the production of aluminium.

By ordering the AUMUND machine, the operator is taking a further step towards fulfilling the strict environmental guidelines of the European Union, through optimization of its production process. Compared to the existing bucket elevator, noise and dust emissions are greatly reduced; therefore workplace conditions are significantly improved.

AUMUND has built a reputation as world-renowned specialist for conveying and storage technology, in almost all branches of the industry, selling more than 18,000 machines. The contract to supply a chain bucket elevator for silo feed of calcined aluminium oxide is, however, the first order of this kind for the Romanian aluminium industry in the entire 90+ years' history of the AUMUND Group.

AUMUND buckets with central chain (example, photo AUMUND).

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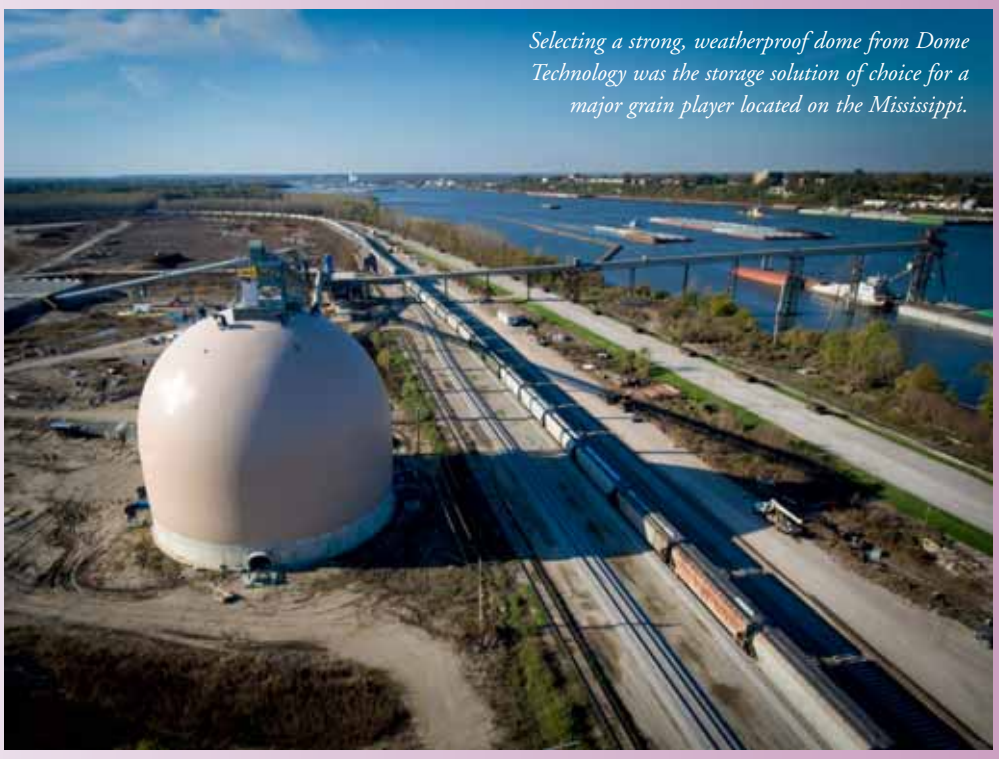
Mould and mildew prevention with a DomeSilo™ for grain storage



Selecting a strong, weatherproof dome from Dome Technology was the storage solution of choice for a major grain player located on the Mississippi.

Temperature swings typical of springtime can set the stage for mould and mildew growth in grain storage, but selecting a reinforced concrete DomeSilo™ is a significant, proactive way to protect grains, even when stored for longer periods of time, *writes Rebecca Long Pyper for Dome Technology*.

Grain producers know that mould, mildew and time are major concerns when storing large amounts of product during warm seasons. According to *DTN/The Progressive Farmer*, since grain stored improperly can experience quality issues as the weather warms up, farmers are encouraged to stay on top of management efforts like grain monitoring, coring bins, and equalizing air temperature in the bin by operating fans.

Although these are good housekeeping measures and no mechanized system can completely replace them, a reinforced-concrete DomeSilo provides a high level of self-management. "The environment is much more manageable than a traditional silo or convectional storage building. You do not have the daily drastic temperature fluctuations a traditional building has," Dome Technology sales manager James Stoker said.

Protected, insulated storage

A more consistent environment is achieved thanks to science and innovative construction. The building process begins as the Dome Technology team inflates a PVC airform that provides the 'form' for what will become the concrete shell; the airform will remain in place indefinitely to provide weatherproofing for the structure. With the airform inflated, polyurethane-foam insulation is applied to the inside to temporarily provide rigidity and to protect the concrete shell for the lifetime of the structure. Shotcrete is then applied, with rebar providing reinforcement.

With construction complete, a dome staves off some boundary issues steel bins and traditional silos face. First, the airform acts as an impermeable membrane that keeps moisture at bay. Second, the heat-sink properties of the reinforced concrete shell combined with the outer layer of polyurethane foam prevents extreme interior temperature fluctuation. These features reduce heating and cooling of the walls and air inside, minimizing or eliminating condensation that damages grain's integrity.

Aeration systems

Besides maintaining integrity, a major advantage of climate control is that businesses can safely store product until demand drives up prices. "Our solution reduces the risk of mould and mildew and allows grains to be stored for longer time periods," Stoker said.

How much longer depends on the location, temperature and humidity. Maintaining proper moisture content is key for multiple reasons, including increased revenue. "The farmer wants the moisture content to be as high as possible because they can sell that weight. However, (grains) also need to be sufficiently dry to not decompose or have other issues," said engineer for Dome Technology Adam Aagard.

To maintain an ideal interior environment, aeration systems maintain the moisture and temperature, making sure interior conditions will help achieve or preserve the appropriate long-term-storage moisture content.

"The systems we've used in the past are designed specifically for aerating and maintaining moisture in grain, and they can typically keep it within 1% to 2% of desired moisture content," Aagard said.

Steel bins are not insulated and are thus prone to greater interior temperature swings, creating condensation problems. In contrast, the combination of a DomeSilo's insulated concrete shell and an aeration system could preserve the life of grain at lower operational costs.

"Grain storage with proper aeration could increase the life of storage up to three years or more. With improper aeration, the life of grain could only last months if the grain contains high amounts of moisture," Stoker said.

If product is coming in hot because it's been sitting in the sun post-harvest or was delivered via truck or rail, an aeration system can be designed to pull off heat, Stoker said. On the other hand, if product is processed and then immediately placed in the dome, the system can be designed to bring the temperature to its desired condition or the system can be designed to maintain product coming in from truck or rail. Also, aeration costs can also be less expensive in a dome because of its seamless, insulated construction and thermal mass.

For even greater climate control, Dome Technology's team can also design higher-power aeration systems that will drive out excess moisture.

"However your facility operates, a DomeSilo can be designed to handle all your storage needs with a much more efficient system than what a traditional structure may require," Stoker said.

SAMSON feeders for Algerian fertilizer company

AUMUND France and SAMSON Materials Handling to provide two additional Samson® feeders to Sorfert, Algeria

In co-operation with AUMUND France, SAMSON Materials Handling has announced an order from Sorfert in Algeria for two identical Samson® material feeder units designed to receive bulk prilled urea from 30-tonne tipping trucks. These new Samson® feeders will discharge into the existing SAMSON shiploaders which have been operational on site at the Aznew Industrial complex since 2010.

Sorfert Algeria is a joint venture between OCI N.V and Sonatrach the state-owned oil and gas authority. AUMUND France has been assisting Sorfert Algeria to develop the mobile materials handling process for many years through the installation of various pieces of equipment.

The Samson® material feeders developed for this project are a rubber belted apron design mounted onto a pneumatic wheeled axle under gear. They will convey the prilled urea on a 3m-wide oil- and fat-resistant belt and discharge via an integral centralizing head chute to the SAMSON shiploader.

The twin feeder configuration chosen by Sorfert considerably reduces downtime. While one Samson® feeder is receiving the prilled urea the subsequent truck can position itself to discharge to the other Samson® feeder. The buffer facility of each feeder ensures that material is still conveying to the shiploader while this repositioning occurs.

Due to the corrosive nature of the material, these new Samson® feeders are fitted with a number of enhanced design and anti-corrosion features to prolong the longevity of the equipment and maintain performance and productivity. Stainless steel fixings are fitted throughout and electrical sensors and exposed sensitive components are treated with clear plastic resin.

For free-flowing particles the brush strips provide a primary seal to maintain directionality of the material flow. The secondary seal strip further prevents material ingress into the chain.

In a busy port environment equipment is heavily used and must be robust. These new Samson® feeders also include a sacrificial truck impact bar to protect the equipment from any impact when positioning loaders.

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Samson® mobile material feeder (example).

Liebherr offers fuel-saving calculator for XPower wheel loaders

- the Liebherr fuel-saving calculator is an online application available at no additional cost;
- for XPower® wheel loaders from the L 550 to the L 586, up-to-date average diesel consumption figures are now available online and updated day by day; and
- fuel consumption is up to 30% less than for comparable machines.

Fuel consumption information for all XPower wheel loaders is now available in the Liebherr fuel-saving calculator. The consumption figures, compiled from live data, are constantly updated and provide information that demonstrates the outstanding efficiency of the XPower wheel loaders. All six models from the L 550 XPower to the L 586 XPower require an average of 30% less fuel than comparable wheel loaders. The L 566 XPower is a particularly good example of the XPower wheel loaders' fuel efficiency. Indications are that during the almost 180,000 operating hours completed by all L 566 XPower® units in use, the average fuel consumption is only 11.5 litres of diesel per operating hour. Even the largest XPower wheel loader, the L 586 XPower, which weighs in at over 32 tonnes, clearly demonstrates its fuel consumption efficiency: under tough conditions, it requires a mere 15.3 litres of diesel per operating hour on average. With these figures, Liebherr's XPower wheel loaders set new standards when it comes to fuel consumption and efficiency.

The fuel-saving calculator for Liebherr earthmoving equipment is a free online tool that enables users to calculate their potential savings. Numerous machine types from the earthmoving product range, including mobile excavators, duty cycle crawler cranes and bulldozers, are already on file. Data for piling and drilling rigs, as well as material handling machines from the LH range, are available in different configurations for applications in recycling and scrapping as well as for the forest and timber industry.

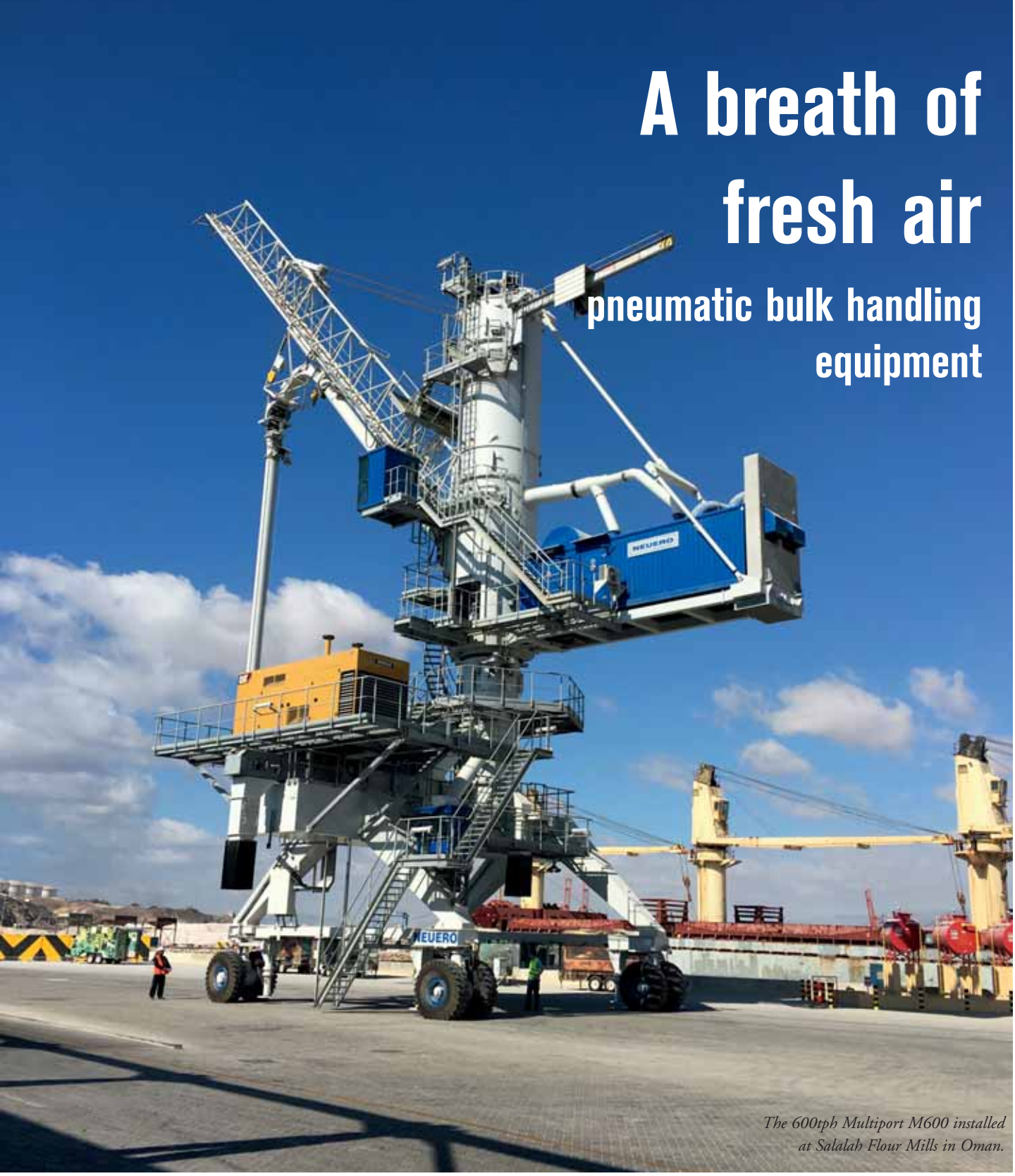
Live data via the Liebherr telematics system LiDAT

LiDAT, the Liebherr telematics system, supplies the data on which the fuel-saving calculator is based. Using live data from LiDAT, the average consumption per hour for each machine type is calculated. This works on the basis of total fuel consumption and total number of operating hours. Data can be gathered from machines registered on the LiDAT system.

To calculate personal savings the calculator needs values for average fuel consumption, annual operating hours and fuel price. The potential fuel saving is then calculated by comparing the data entered with the average for all relevant LiDAT machines.

A breath of fresh air

pneumatic bulk handling equipment



The 600tph Multiport M600 installed at Salalah Flour Mills in Oman.

Unloaders from NEUERO make their mark in the Middle East

Neuero Industrietechnik für Förderanlagen GmbH (NEUERO) offers turnkey solutions in the bulk solids handling field, and has particular expertise in pneumatic handling of cargo.

NEUERO operates according to the 'Made in Germany' tradition, providing high quality, environmentally friendly and durable loading and unloading equipment for industrial plants, silo terminals, power plants, aluminium smelters, malting plants, feed mills, etc. The company has been in business for over 100 years, during which time it has supplied reliable, high-quality equipment for crucial projects in industrial plants around the world.

NEUERO is a specialist in pneumatic and mechanical bulk material handling, and manufactures continuous ship unloaders (CSU), a highly environmentally friendly solution in ship discharging activity, and shiploaders

NEUERO is global client oriented, and its equipment is flexible and cost effective. The company uses only state-of-the-art technology, and the reliability of its solutions has ensured the success of all realized projects.

NEUERO has its own 6,550m^2 manufacturing facility plus a new logistical area which was added beginning of 2013 in Melle. Equipped with its own machining shop, painting shop and

The 600tph Multiport M600 installed at Salalah Flour Mills in Oman.

laboratory, NEUERO is in a position to provide continuous engineering solutions to its customers.

Worldwide presence is assured with the operation of NEUERO Corporation in Chicago/USA as well as its partnership with Brazilian companies for grain and mineral handling — Maquinas Condor and Isomonte.

Using expert know how for upgrades, retrofits or complete new installations, NEUERO's goal is always the same — solving the tasks effectively on budget and on time. The result is quality solution engineering that respects and protects the environmental, health and safety (HSE) requirements of its customers' companies and their communities.

NEUERO is an ISO 9001 certified company and received the OHSAS 18001 certification in 2013.

NEUERO works together with well-known German sub-suppliers like SEW, Atlas Copco, Danfoss, Rothe Erde and others.

Recent orders

Neuero has successfully delivered and installed a repeat order for Salalah Flour Mills (SFM) in Oman, Globemarine in Saudi Arabia and to GCSS in Egypt.

SFM — Salalah Oman

NEUERO supplied a 600tph (tonnes per hour) Multiport M600,

The 600tph Multiport M600 installed at Salalah Flour Mills in Oman.

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Engineering

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mounted on tyres, with its newest generation of electric travelling system. The unit features: a 30m horizontal boom for the efficient unloading of Panamax ships; 15-tonne auxiliary payloader winch to lift payloaders to enable efficient hatch clean-up; three outlets for efficient logistic with trucks; and the possibility to lower the boom to the ground for easy control and safe maintenance.

Globemarine

Contract for ten pieces of equipment: seven GSD mobile unloaders are already in operation and three 400tph Multiport M400s are being erected in Dammam.

Seven GSD mobile unloaders are already in operation at Globemarine in Damman.

Multiport M700 at Damietta in Egypt.

GCSS – Egypt – Damietta

A 700tph Multiport M700 on rails, with shuttle conveyor to connect to the quay conveyor.

GCSS – Egypt – Alameria

Two special Multiport M400s, on rubber tyres, with a 20m height designed to pass under port structures. Fitted with a 10-tonne payloader winch, and new travelling steering and electrical drive system. With two truck outlets and 27m horizontal boom.

Two special Multiport M400s are in operation for GCSS in Alameria in Egypt.

Portable pneumatic unloader meets the demands of the developing grain industry

GENMA has a great deal of experience in the manufacture and delivery of pneumatic ship unloaders. The company's GPU series, which has capacities ranging from 80tph (tonnes per hour) to 600tph (single pipe), equipped with multi-stage turbo blower, can save nearly 30% energy compared to unloaders using roots blowers. GENMA has delivered projects to grain and cement industries in different countries.

By visiting terminals, grain and logistics companies, GENMA has discovered that there is huge demand for small portable pneumatic unloaders, especially in the grain industry.

In China, due to the scattered production and trade in grain industry, grain materials have to go through a variety of transportation methods and logistics hubs before finally being delivered to shippers. These include, but are not limited to, short haul vehicle transport, grain depot, small and medium-sized terminals and specialized grain terminals. Therefore, in each process there's urgent demand for portable pneumatic unloader.

GENMA developed a series of portable pneumatic unloaders, which can be widely used in bulk grain handling and transportation, and can also assist the clearance. These unloaders are usually customized and adapted to the client's environment.

This series — the GENMA Bulk GPP series of portable pneumatic unloaders — offers capacities ranging from 15tph to 200tph. The series — as well as the pneumatic ship unloaders — are equipped with multistage turbo blower systems. The airflows can be auto-adjustable, which can effectively minimize the wearing on the pipe and material crushing rate.

Currently, there are two main ways for clearance in Chinese terminals. One is a very primitive method, to hire extra dustmen; the other is clearance with the assistance of skid-steer loaders.

The GPP series of unloaders can also contribute to clear-up inside the vessel holds. Because of the unit's small size and flexibility, it can be transferred to any area where unloading, loading or transfer is needed — it is truly versatile.

About GENMA

The brand GENMA belongs to Rainbow Heavy Industries (RHI), which mainly provides material handling solutions. Aside from its expertise in container handling solutions, GENMA is also expanding broadly in the bulk handling business.

The headquarters of GENMA is located in Shanghai, China. The manufacturing, technology and R&D centres are in Nantong, China. To better serve customers, GENMA has set up sales and service contact offices in Singapore, India, Belgium and Canada. Besides that, its agents in Asia, Africa, South America and Middle East can also provide a quick response service.

GENMA's methodology is to help multi-industry clients benefit from its service.

VIGAN

Pneumatic or Mechanical Ship Loaders & Unloaders Port Equipment - Turnkey Projects

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Average efficiency 75%-80%
All sizes of vessels
All types of grains

PORTABLE GRAIN PUMPS up to 270 t/h

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VIGAN builds strong relationships with Morocco

Morocco is a significant wheat producer, but also a major wheat importer as its consumption is far above the production rate. Moreover, its location and weather conditions cause instability in production.

The cereal import regulating government body, ONICL (Office National Interprofessionnel des Céréales et des Légumineuses), makes sure that the country does not run out of wheat.

Usually, once Moroccan farmers have sold all of their wheat, ONICL completes its stocks by reducing the import tariffs and making it easier for importers, namely coming from France and Northern Europe countries, United States and Canada.

ONICL has four grain silos located within the ports of Casablanca, Safi, Nador and Agadir.

These silos, managed by its subsidiary SOSIPO (Société des Silos Portuaires), control the unloading and transfer operations of grain imports.

VIGAN's role in Moroccan grain imports

VIGAN has been active in Morocco for 35 years and, notably, has established strong relationships with SOSIPO.

The first VIGAN pneumatic unloaders (two 160tph [tonnes per hour] NIVs) were installed in 1982 in the Port of Nador.

Later, in 1995, SOSIPO bought a further two VIGAN pneumatic unloaders — type NIV 250tph — for the Port of Casablanca.

In 2004, a new order for one NIV 300tph completed the series in the Port of Safi.

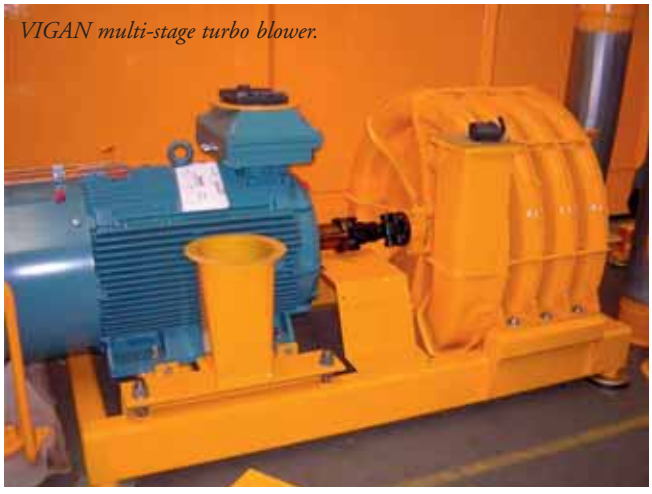
All these machines are still in operation and VIGAN is proud to continue servicing SOSIPO with the necessary spare parts.

In this context, two years ago, VIGAN carried out modifications on the two NIV 250tph from 1995 in the Port of Casablanca. VIGAN installed new multi-stage turbo blowers and electrical cabinets with frequency inverters to control the turbo blowers.

This has led to significant savings in energy consumption, thanks to:

- direct coupling instead of transmission belt;
- suppression of the mechanical air regulator. The air regulation is now controlled by the inverter; and
- when the suction is stopped by the operator or by the locking system, the inverter stops the blower, leading to additional cost savings during stoppages.

The machine already enjoyed very good capacity rates, but these modifications also resulted in:



VIGAN multi-stage turbo blower.

VIGAN pneumatic unloaders installed in Casablanca 20 years ago.

- better control of hold cleaning due to the frequency variation; and
- lower necessary maintenance level resulting in reduced maintenance costs;

This is not the first time that VIGAN has suggested to its customers that they should put a new turbo-blower on their old machines, leading to energy savings estimated at ±30%.

For ten years, this system of multi-stage turbo blower with frequency inverter has been a standard design on all VIGAN NIV models.

A new unloader in Casablanca

The Port of Casablanca is one of the largest ports in Morocco, and the grain trade is mostly related to wheat and corn imports. Two share this activity in Port of Casablanca: SOSIPO and Mass Céréales Al Maghreb, a port operator that uses a new terminal for grain unloading and storage.

They are both equipped with unloading gantries, conveyors for the transfer of grain, silos for the storage of cereals, and truck/railcar loading stations.

VIGAN has just installed its sixth machine in Morocco, which has been in operation since January 2017 at Mass Céréales Al Maghreb.

VIGAN NIV 600tph/500kW installed at the new terminal of Mass Céréales Al Maghreb in the Port of Casablanca.

The pneumatic unloading machine type NIV 600tph/500kW is on rails and has a rail span of 16m. The chain conveyor is equipped with five pneumatic valves, allowing either the alternative loading of three lines of trucks, the loading of railcars, or the feeding of the two quay conveyors to transfer grain to silos.

VIGAN NIV is equipped with a boom of 30m length, and is designed for the unloading of vessels up to 70,000dwt of wheat and corn.

With two electrical motors of 250kW, 400V, 50Hz with frequency inverter, the unloader has two four-stage turbo blowers with direct transmission and coupling.

This standard design VIGAN machine is particularly well-suited for final hold-clean up, and was principally chosen by the customer for this reason. Since then, VIGAN is proud that its equipment not only satisfies customer requirements, but has also been chosen to work every time a vessel needs to be unloaded.

Pneumat Systems' HopperPopper

Assisting bulk material clean-out for railcars and trucks

The HopperPopper from Pneumat Systems assists in the unloading of DDGs (distiller's dried grains) and meal products from railcars or trucks by combining the power of compressed air blast technology with precise hydraulic controls. Through patent pending technology, the wirelessly controlled HopperPopper allows operators to position a hydraulically driven blast probe in the hopper compartment, blasting out bulk material bridges and hang-ups. The HopperPopper eliminates problems that come from banging, pounding and poking railcars or trucks, while decreasing unload times, reducing labour costs and minimizing worker compensation risks.

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

Pneumatic unloader plays major role in solving pollution when unloading grain

Fig. 1: Preparing to unload dried tapioca chips.

How much do you know about pollution during grain unloading operations?

Grain is quite a typical dry bulk cargo; unlike container handling, it is easy to cause pollution during grain unloading operations. Cassava, for example, is one of the most polluting cargoes, especially in non-enclosed operations, as its starch content can be as high at 70–75%.

We hear a lot about pollution during grain unloading, but do we really know how terrible it can be? Recently the staff of GENMA Bulk visited one port in China and experienced first-hand the true pollution situation in the frontline.

As Figure1 shows, the working environment is very bad. Even with a helmet, gauze mask and protective suit, the worker's face, eye socket and nasal cavity are still covered with dust after operation. Working continuously in this environment can cause serious damage to health. There is also significant cleaning up that needs to be carried out after unloading is completed. The ground and the vessel are both covered in dust. Dust pollution to the water must also be considered.

Quite apart from humanitarian considerations, such pollution is bad news from a business point of view. It leads to complaints from local residents, and penalties from government, and the need for supervision. The result can be the suspension of unloading activities until the problem is solved. While some may be callous enough to ignore the health and safety of workers, nobody will neglect financial losses incurred during suspension of operations. In the worst-case scenario, businesses can be shut down if pollution is not addressed.

Non-enclosed operations at the root of grain unloading pollution

Levels of pollution vary according to the cargo handled. Cassava contains very high levels of starch, without the protection of a skin, so is generally exported in slices, cubes or pellets — dust pollution is therefore very high.

Most developed countries choose enclosed unloading solutions — including pneumatic systems — to avoid pollution. In China, most users choose to use portal cranes to unload using grabs, and this is the major cause of pollution. Along with enhanced environmental awareness, more and more Chinese ports and logistics companies are realizing that it is imperative to control the dust pollution, otherwise losses from claims and government supervision will be incalculable.

Minimize pollution, maximize profit — and make it sustainable

So how can we reduce dust pollution? There are two major steps that can be taken — one before the cargo leaves the vessel, and the other after the cargo is out of the vessel.

One solution when handling the cargo before it leaves the vessel is to change non-enclosed unloading into enclosed unloading. Using a portal crane can lead to material loss and terrible dust emissions. Using a pneumatic ship unloader that operates in a closed environment ensures that dust pollution is minimized.

GENMA offers its GPU series of pneumatic ship-unloaders that are equipped with multi-stage turbo blowers, which are more automated and make very little noise.

Once the cargo has left the vessel, another

Fig. 2: Grain unloading using a pneumatic ship-unloader.

dust-control measure is to use environmental hoppers in place of ordinary hoppers. As shown in Figure 3, using an ordinary hopper without any dust-control measures causes serious dust emissions.

GENMA's environmental hopper uses the 'FLEX-FLAP' dedusting system and is equipped with four efficient dedusting units to create downward flow which is no less than 1m/s via induced-draught. In this way, no dust will overflow or leak. After this, the gathered dust will be blown back into the hopper. These measures ensure that there is virtually no fugitive dust.

In 2015, GENMA delivered three of its environmental hoppers to APM Terminal, which is owned by Maersk Group. One of these three is shown in operation in Figure 4, and shows clearly that there is virtually no dust leakage.

Fig 3: Dried tapioca chips unloaded with the portal crane and ordinary hopper.

Fig 4: GENMA environmental hopper operating with no dust leakage.

These two dust-control measures can be used either together or separately, depending on the available budget. Both significantly reduce dust pollution to make the business sustainable and maximize profit.

Breaking down barriers to biomass handling

Louise Dodds-Ely

Conductix-Wampfler helps power growth in the US wood pellet market

In 2012, Fram Renewal Fuels, a Georgia-based wood pellet manufacturer, expanded its operations in the city of Hazlehurst, Georgia, USA. Astec, Inc., headquartered in Chattanooga, Tennessee, financed the complete pellet plant project including both portable and mobile plant equipment. For that initial project, Conductix-Wampfler supplied three magnetic coupler motor driven reels with fibre optic cable to be used on two bulk stackers and a tripper-conveyor at the plant.

Later, in 2014, Larry Thomas, Senior Project Manager at Kolberg-Pioneer, reached out to Conductix-Wampfler regarding a similar project. Kolberg-Pioneer, located in Yankton, South Dakota, had been given the go-ahead to secure the equipment for a new wood pellet project that Astec Industries was designing and building. This new project included a complete wood pellet plant for Highland Pellets just outside of Pine Bluff, Arkansas.

With the global demand for wood pellets increasing steadily since 2007 due to carbon reduction policies, US manufacturers like Highland Pellets have been responding to this growing market. US wood pellet exports doubled from 1.6mt (million short tons) [approximately 22 trillion BTUs] in 2012 to 3.2mt in 2013.

The wood pellet market includes two primary sectors: industrial wood pellets that are used as a substitute for coal in power plants and premium pellets used in pellet stoves and pellet boilers for heating. Wood pellets are traditionally manufactured from wood waste, including sawdust, shavings, and wood chips, that results from wood processing activities. They can also be produced from unprocessed harvested wood at a generally higher cost.

The growth of US wood pellet exports has been concentrated in the southeastern part of the United States, which has an abundant supply of raw material and relatively low shipping costs to Europe.

According to Global Trade Information Services, the United States was the leading exporter of wood pellets to the EU in 2015, capturing 59% of the EU's import market. Most of the wood pellets produced in the US are bound for the UK's power plants. This is primarily due to material availability, low production, and logistics costs. One major user of US wood pellets is Drax Power Limited (part of Drax Group Plc). Drax supplies about 8% of the UK's electricity needs.

For the Pine Bluff pellet project, Conductix-Wampfler provided three magnetic coupler motor-driven reels designed to handle 250 feet of Prysmian #4/0 AWG, three conductor cable,

type G-GC. This cable included 2kV-rated power conductors and 12 optical fibre conductors. These reels provide power and control via the fibres to run the stackers used at this plant. The resulting wood pellets are shipped to Drax Biomass via the Port of Greater Baton Rouge, LA for their UK power plants.

Thomas explained that "Conductix-Wampfler was chosen to supply the cable reeling system due to their extensive experience with the use of fibre-optic cables in the bulk handling industry. We received favourable references concerning their work. Conductix-Wampfler was able to provide the cable and custom-design the reeling system. We were impressed with the Conductix-Wampfler team throughout every single phase of this project."

Given the positive impact that wood pellets have on global energy picture and on US exports, Conductix-Wampfler is proud to be part of this growing industry.

Keeping it clean with rotary brush cleaner from Horizon Conveyor Equipment

UK-based company Horizon Conveyor Equipment has developed a belt-powered rotary brush cleaner which can also be adapted to run with an electric motor. The cone brush system is different to standard rotary brush cleaners as the unique design of the brush allows material to be cleaned off the conveyor belt without clogging up the brush. Another unique feature is the cone shape which allows the brush to be self-adjusting without having separate spring devices to take up the wear on the bristles, keeping the brush in contact with the conveyor belt at all times.

Alan Bowler, Managing Director of Horizon Conveyor Equipment, said: "Since first developing the cone brush cleaner four years ago, we've successfully sold this brush system into many different market sectors, conveying various different types of materials on both flat and chevron conveyor belts".

Anti-static cone brush cleaner installed on a 1,400mm-wide biomass conveyor.

Conveyors transporting biomass and dusty materials: The transition to renewable energy products, such as biomass, which is being handled at ports and power stations, has grown quite rapidly in the UK and throughout Europe over the past five years. Conventional belt cleaners are not always the best option for removing the biomass dust particles that tend to stick to the conveyor belt leaving a film of dust. The dust is easily carried out through the back and sides of the chute and is then released into the atmosphere. This airborne dust creates a health and safety risk with occupational health respiratory diseases which can affect staff working on site.

Three years ago Horizon was approached by RWE Tilbury, the UK's first dedicated biomass power station, to look at reducing the numerous problems associated with dust particles. Working to strict Atex Zone 22 specifications, Horizon developed the existing cone brush design to help reduce static generation which in turn significantly reduced the static build up.

Together with the assistance of a West Midlands-based static testing company, Horizon discovered that the standard cone brush bristles generated a static value of 4,000–5,000 volts at 400–500mm distance from the brush and 5,000-8,000 volts at a 50mm distance from the brush, which potentially could ignite biomass dust. After developing the new brush design, the static values have now significantly reduced down to zero volts at a distance of 400–500mm away from the brush and a more acceptable level of 200–400 volts at 50mm distance from the brush.

In addition to the cone brush system, Horizon has developed anti-static strips for sealing the backs and sides of conveyor chutes which help to eliminate fine airborne particles escaping whilst the conveyor is in operation. Following recent successful trials on one conveyor at another large UK Biomass plant they were subsequently retro-fitted to a further 32 chutes on the same plant.

To complement the cone brush cleaner, Horizon also recommends its range of anti-static primary belt cleaners fitted with polyurethane blades. When fitted in conjunction with the cone brush cleaner, the primary scraper will significantly reduce the amount of material being carried back.

These new PU blades have a surface resistivity less than 10 Ω/sq eliminating the excess build-up of static electricity within the component. This brings the PU scraper blades in-line with clause 4.5.3 – Conductivity criteria for conveyor belts, in *CLC/TR 50404:2003 Electrostatics – Code of practice for the avoidance of hazards due to static electricity*.

Horizon Conveyor Equipment is a UK-based manufacturer producing a wide range of high quality conveyor equipment including steel and HDPE-plastic conveyor idlers, belt cleaners, rotary brush cleaners and spillage equipment supplying throughout the UK, Europe and worldwide to the mining and quarrying industries, ports and power stations.

Anti-static sealing strips seen outside the back of the chute.

Anti-static sealing strips on the inside of the chute.

PHB Weserhütte fuel handling system for largest-ever biomass power plant

PHB Weserhütte S.A.U. has been recently awarded a contract to supply the biomass handling system for the Tees Renewable Energy Plant Project, located in Teesside, United Kingdom, by the joint venture Técnicas Reunidas (TR) & Samsung C&T.

With this new contract, PHB Weserhütte is strengthening its position in the renewable energy sector as a global supplier of materials handling equipment with its own state-of-the-art technology.

The scope of supply of the PHB Weserhütte contract comprises design, fabrication, transportation and erection of the complete fuel handling system of the new 299MWe power plant. This power plant will be the largest ever biomass-fuelled power station in the world.

The fuel handling system will be designed to handle both woodchips and wood pellets at an annual capacity higher than 1.8mt (million tonnes).

Specifically, PHB Weserhütte will supply:

- ten air-supported belt conveyors;
- 23 conventional conveyors;
- 16 steel silos to store 252,000m³, diameter 27 metres;
- vibrating floor below silos;
- 64 vibrating feeders;
- disc screens;
- woodchip belt dryer;
- vessel reception system;
- truck unloading system; and
- as-received and as-fired sampling systems.

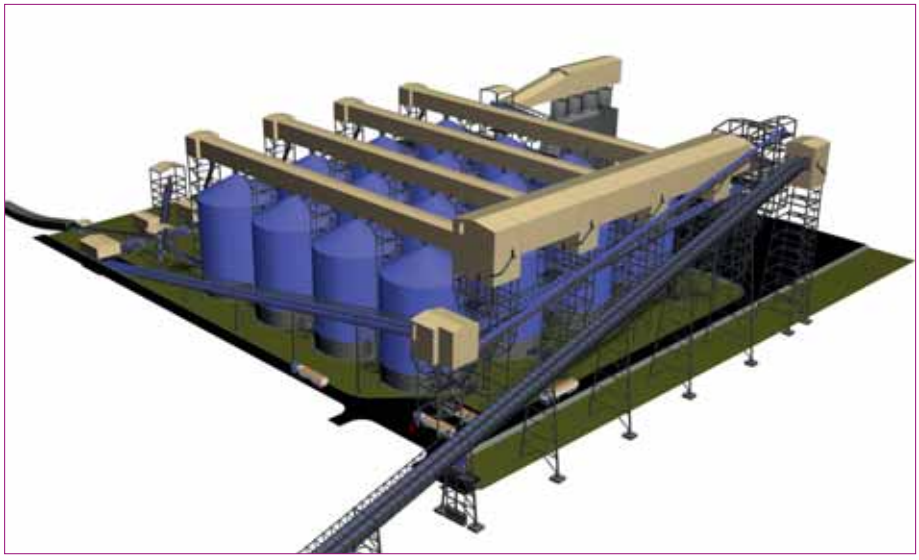
Taking into account the explosive nature of the dust generated by the materials to be handled, the project will be designed according to latest ATEX and DSEAR requirements, with special designs for dust filters, vacuum cleaning system and explosion-relief panels.

Regarding the fire protection measures, linear temperature systems will be supplied in silos and transfer points. Continuous gas monitoring systems will also be supplied inside the silos to maintain the oxygen content and avoid fires.

British local companies will participate in the manufacturing and installation of the equipment. The complete instrumentation and control system will be developed by TSK Electronica y Electricidad, parent company of PHB Weserhütte.

PHB Weserhütte is part of TSK, a global company that specializes in the execution of complex projects at an international level, providing its own technology for different sectors in industry such as electrical infrastructures, industrial plants, energy generation power plants (conventional and renewable), oil & gas, water treatment plants or installations for handling and storage of raw materials. In 2016 TSK achieved a turnover of €900 million, with more than 1,000 professionals and international presence in more than 35 countries.

PHB Weserhütte has more than 50 years in the material handling industry. It has vast experience designing and manufacturing the following equipment and systems:



- bulk marine terminals;
- belt conveyors;
- ship and barge loaders;
- ecological hoppers;
- stacker units;
- scraper-reclaimer units (bridge reclaimers, portal reclaimers, semi-portal reclaimers, side reclaimers, etc);
- bucketwheel stacker reclaimers;
- pipe conveyors;
- articulated boom slewing cranes;
- longitudinal stockyards and blending beds; and
- circular stockyards and blending beds.

PHB

Weserhütte

Handling & Mining

Bulk marine terminals / Belt Conveyors / Ship and Barge Loaders / Ecological hoppers
Stacker units / Scraper-Reclaimer units / Bucket wheel stacker reclaimers / Pipe conveyors
Articulated boom Slewing cranes / Longitudinal stockyards and Blending beds
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CASE wheel loaders fit the bill for Imog waste management facilities

CASE is the loader supplier of choice for Belgian waste management company Imog. Its loaders meet the high expectations of facilities that operate virtually round the clock in harsh conditions, and can't afford down time.

Imog provides integrated waste management services to 11 municipalities across the Province of West Flanders, in Belgium. The company aims to contribute to the sustainable and socially responsible use of materials and energy by helping the communities it serves to minimize waste, recover raw materials and generate renewable energy. To provide this service, Imog operates two treatment facilities: Imog Moen where it processes waste for composting, deals with bottom ash, wood waste and landfill, and sorts bulky waste; and Imog Harelbeke for PMD waste (packaging made of plastic or metal, and drink cartons), paper and cardboard.

Waste management operations like Imog have high expectations of their equipment, as they typically work virtually round the clock, seven days a week, in very harsh conditions. Imog regularly renews its equipment to maximize its fleet's productivity, and it has been a loyal CASE customer for the past 20 years. The most recent CASE additions to its fleet were five F Series wheel loaders purchased over the last two years. The three 821F and two 1021F units are at work in Imog's two recycling facilities, loading trucks and handling a variety of materials, such as paper, PMD, wood, compost and plastics and loading them on the production lines.

Jeroen De Craemere, Purchasing Manager and Project Engineer at Imog explains the consistent choice of CASE wheel loaders for its operations: "We need our wheel loaders to be very powerful, but with fuel consumption as low as possible. They also have to provide great visibility, as they work in a busy environment. CASE wheel loaders give us all this, and more. And our operators really appreciate the excellent comfort of these machines."

F Series wheel loaders bristle with features ideal for waste handling applications, from the Hi-eSCR technology and rear-mounted engine to the heavy-duty cooling cube. CASE's HI-eSCR technology doesn't require EGR or particulate filter, it only uses built-for-life-components, and it is maintenance free and fuel efficient. Very importantly, it has the advantage of safety near flammable materials such as wood chips, as the exhaust's maximum temperature of 500°C is 200°C lower than it would be with a DPF. This is particularly useful in facilities such as Imog's, where the F Series wheel loaders are handling flammable materials such as paper, cardboard and wood. Another feature that is extremely valuable in waste handling applications is the CASE Heavy-duty Cooling option, which prevents clogging of the radiator.

The F Series wheel loaders purchased by Imog have been specified and adapted for the specific conditions of Imog's facilities, and feature radar and reversing camera for safe and easy manoeuvring in the busy sites, pressurized cab to protect the operators in the dusty conditions, protection for the front windscreen for safety.

Another important reason for Imog's loyalty for CASE is its dealer, Delvano NV for its know-how, after-sales service and the experience of its technicians. Over the years, it has built a close relationship, as Joachim Vanlerberghe, Delvano Sales Director, explains: "I believe that in order to provide good support to our customers, it is essential to know their business very well and to be in touch regularly, so that we can anticipate their needs and work with them to ensure their fleet always matches their requirements and works at its best. That's why I keep in close personal contact with Imog's operators and management team."

Delvano NV sells and supports the full line of CASE equipment in the provinces of South West Flanders and south East Flanders and Hainaut, and is a sub-dealer of CASE Dealer Key-Tec since 2012.

CASE Construction Equipment sells and supports a full line of construction equipment around the world, including loader/backhoes, excavators, motor graders, wheel loaders, vibratory compaction rollers, crawler dozers, skid steers, compact track loaders and rough-terrain forklifts. Through CASE dealers, customers have access to a true professional partner with world-class equipment and aftermarket support, industry-leading warranties and flexible financing.

TMSA

Ship Loaders

TMSA are specialists in the design and manufacturing of ship loaders for a vast variety of bulk materials, ranging from agricultural to mineral commodities. Our In-House Design Engineers are Experts in Loading Solutions, and will meet every customer unique equipment requirements.

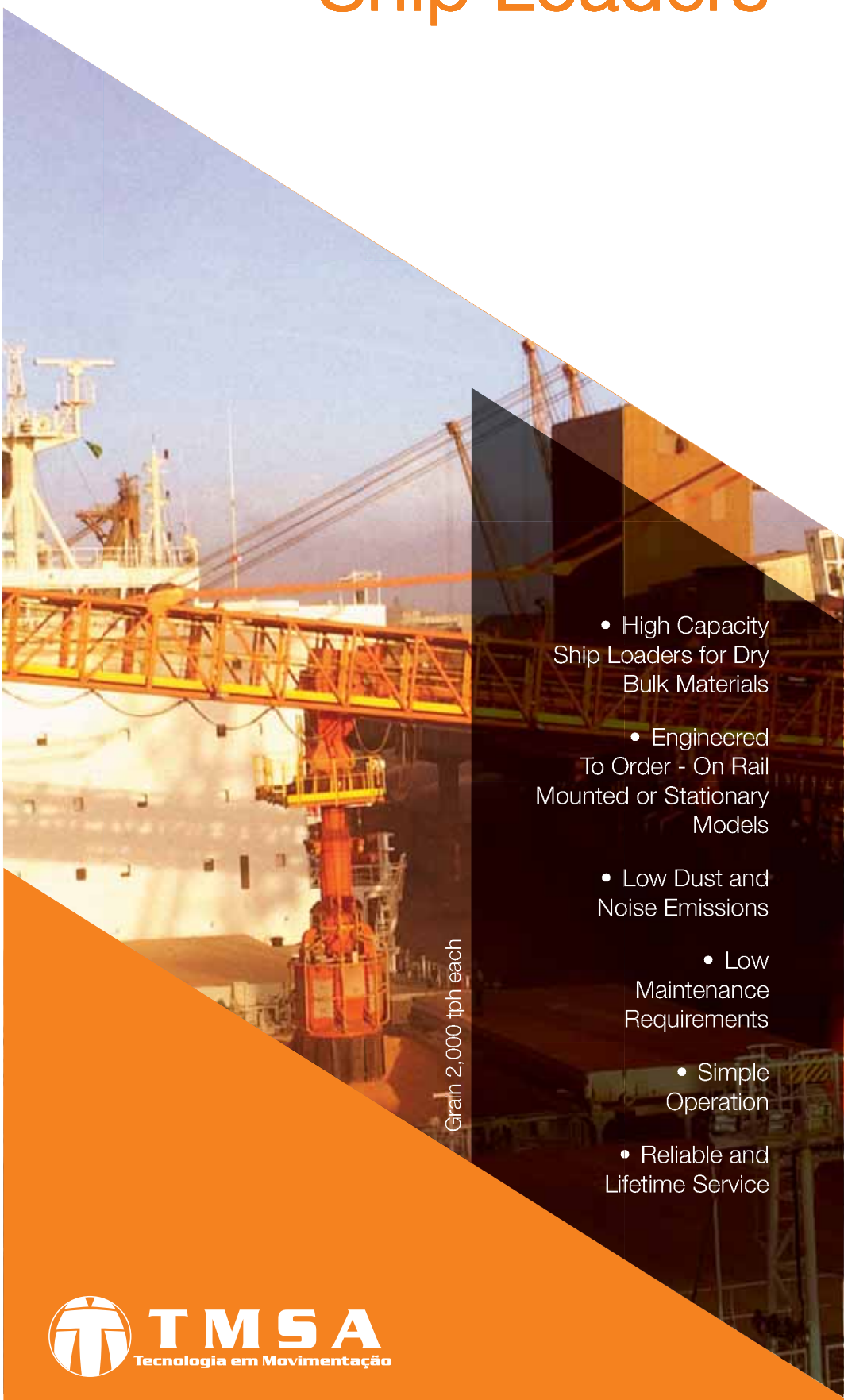
Iron Ore 4,000 tph

Grain/wood chips 2,500 tph

Grain 1,500 tph

Grain 2,000 tph

Sugar 3,000 tph



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PEINER SMAG focuses on bioenergy

Biomass — a global business

Biomass has quickly become a global business due to the worldwide interest in modern energy. PEINER SMAG Lifting Technologies GmbH (PEINER SMAG) is already well prepared for this greater demand in renewable energy sources. The major manufacturer of lifting equipment offers individual solutions for the handling of biomass by providing the right grab for almost all lifting devices. All of the PEINER SMAG grabs have been designed with sustainable and ecological construction. The company has recently implemented an integrated management system (IMS) which combines the individual areas of quality, environment, protection of employment and energy into one grab unit. This new system was successfully certified by TÜV Süd in accordance with ISO 9001, 14001, 50001 and OHAS 18001.

PEINER Motor Orange Peel Grab, Type MMGL-4, handling domestic waste.

Better equipment means better results

The technical and economical growth potential of renewable energy for the production of power, heat and fuels is substantial, with biomass covering over 10% of the world's energy demand. The transshipment of biomass volume in ports and terminals, waste-to-energy plants, timber mills and co-generation plants is ever increasing. Apart from agricultural goods such as corn, sugar cane, canola and other food crops, biomass products such as timber, bark, saw mill waste, wood chips and pellets are handled. In addition, organic waste from household rubbish and residual products from the food industry also play an important role in the handling of biomass.

With its wide range of applications, PEINER grabs can handle all kinds of biomass materials, with certain grabs tailored towards the special needs and requirements of particular industries. In the timber handling industries the use of hydraulic and electro-hydraulic timber grabs are primarily common place, with operators benefit from their high-load capacity, high closing force and special shaped tongs for the handling of timber logs. These key features enable the grab to handle logs in any variety, whether round timber, bundled and even single logs safely and efficiently.

When handling bulk materials such as wood chips and wood pellets, crop or organic waste, motor grabs or four-rope grabs are generally used. Due to their technical features PEINER motor grabs offer numerous advantages, especially for their use in incinerator plants. The PEINER MMG/MMGL series of motor 'orange peel' grabs is already successfully established within the incineration market. Its specially designed construction allows for fast operation and is highly energy efficient. The optimal installation height, low centre of gravity and robust design ensures the flexible use of the MMG/MMGL series. Thanks to individually driven shell segments, the motor 'orange peel' grab adapts to suit the materials being handled. The shell segment design and the number of shell segments on the grab can easily be adapted to meet customer requirements. Hydraulic pipes, wiring and connections as well as the cylinder barrel and piston rod are fully protected from external elements.

PEINER Motor Orange Peel Grab, Type MMGL-4, handling rubbish at a waste-to-energy plant.

PEINER Motor Dual Scoop Grab, Type MTGL-3, working in an ash bunker.

Depending on the field of application, PEINER SMAG offers

customers the option of mechanically operated rope crabs which are available in clamshell or orange peel grab design. Both types are considered solid and reliable. The balance ratio between the dead weight and grab volume or crane capacity respectively; provides a good level of penetration into the bulk material supporting higher throughput rates.

Conclusion

PEINER SMAG discerns a positive trend in the handling of biomass and continues to expand its efforts in providing high quality reliable grabs in this market, particularly in the waste incineration industry. An existing framework agreement with a major client for the delivery of motor grabs to operate in the incineration plant has been highly successful with incoming waste and the bi-product of ashes handled by the MMGL/MMTGL series PEINER motor 'orange peel' grabs. From PEINER's excellent track record and successful implementation of biomass grabs, further orders from this market segment are expected.

PEINER Four-Rope Orange Peel Grab, Type VMG, handling wood chips.

About PEINER SMAG Lifting Technologies GmbH

PEINER SMAG Lifting Technologies GmbH (PEINER SMAG), a subsidiary of SMAG, leads the world in manufacturing grabs and other lifting accessories for cargo handling. Based in Salzgitter, Germany, PEINER SMAG runs manufacturing sites in Germany, China, India and Singapore. On the basis of the proven PEINER product design, the special-purpose machinery manufacturer develops, manufactures and services lifting equipment for various industries, e.g. ports, ships, steel mills, waste-to-energy plants and recycling/scrap handling businesses.

PEINER Motor Dual Scoop Grab, Type MZGL, handling wood chips.

About Salzgitter Maschinenbau AG

Salzgitter Maschinenbau AG (SMAG) is the holding company of a German group of mechanical engineering companies with factories in Germany, China, India, Singapore and Slovakia where grabs for loading and unloading seagoing cargo vessels, spreaders for container handling, fully equipped driver cabins, automated drilling technology for the open-pit and underground mining industry, special-purpose vehicles for the process industry as well as mechanic and hydraulic telescopic antenna masts are developed and manufactured.

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Handling the biomass boom

The growing pressure to reduce CO_2 emissions has seen an enormous growth in the transshipment of biomass, *writes Les Williams of Dunlop*. With the Kyoto Protocol and the EU's continuing objective to reduce its member's states' carbon footprints, more and more countries are making the push towards biofuel. In fact, the EU wants to achieve 63% of heat generation by biomass by 2020. Just in the Port of Amsterdam alone, the boom in biomass volumes means that the port could see handling of biomass products rise from its current 1.5mt (million tonnes) per annum to 6mt by 2020. At the same time, there continues to be a parallel decline in the volume of coal transshipment. As Bob Dylan famously sang, "the times they are a – changing."

For a great many reasons, conveyor systems previously used to carry coal or other cargo such as iron ore cannot simply be used to carry biomass. Adapting existing conveyor systems and building new ones entails enormous investment and very expensive lessons are already being learnt. Here we discuss the impact of handling the biomass boom and its ramifications concerning conveyor systems, maintenance, safety and the critical importance of conveyor belt technology.

What is biomass?

Biomass is used to meet a variety of energy needs, including generating electricity, heating homes, fuelling vehicles and providing process heat for industrial facilities. To the uninitiated, a commonly held belief is that biomass is simply compressed wood waste that is formed into pellets. Not unsurprisingly, it is not nearly as simple as that. Biomass can be made up of a combination of several different resources. Apart from wood and wood waste (of which there are several types), biomass can include agricultural crops and their waste by-products, municipal solid waste, animal wastes, waste from food processing and even aquatic plants and algae. Nowadays, ports often receive shipments that contain a mixture of different biomass pellets.

This multitude of different organisms plus other characteristics of biomass provide a wide range of challenges and demands in terms of safety, maintenance and efficiency. These challenges certainly apply to the conveyor belts used to carry biomass. Apart from the usual considerations of adequate tensile strength, tear strength, elongation and cross-rigidity, there are four essential characteristics that biomass-carrying belts must have, all of which have a direct or at least important influence on safety.

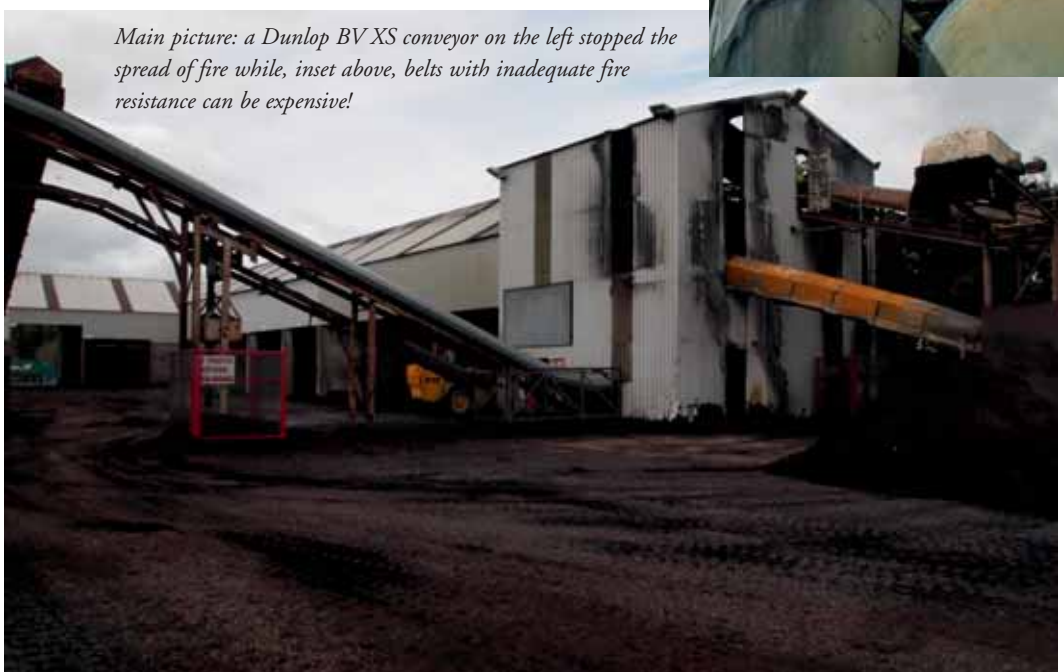
Risk of explosion

One of the biggest issues is dust emission. In the production process of biomass wood pellets, wood chip and similar renewable resources, the materials are continually broken down. This results in high levels of combustible dust. The dry flammable dust found in biomass can be ignited even by abrasion created within a conveyor system because the source only requires ignition energy as low as 17mJ for the ultimate ignition. This is one of the major factors in biomass dust explosion prevention. Biomass dust can also be highly prone to self-ignition, especially if the material has become damp. A chemical reaction can take place that causes self-heating and what is referred to as 'off-gassing' (carbon dioxide, carbon monoxide and methane emissions).

In the atmosphere immediately surrounding a biomass conveyor, there should be no more than 35 grammes of dust in a cubic metre of air. Put into perspective, that is approximately the volume of a small tube of popular children's sweets. This means that conveyor design including dust extraction systems and chutes take on a much greater importance. Strict conformity to Directive 94/9/EC (also known as 'ATEX 95' or 'the ATEX Equipment Directive') applicable to potentially explosive atmospheres of zones 20, 21 and 22 where combustible dust is present should be a pre-requisite.

Dust build-up has to be kept to an absolute minimum, which means almost constant cleaning. When carrying out any form of maintenance or repair, the dust must be completely removed within several meters of the working area to prevent the possibility of ignition. From a conveyor belt point of view, it is absolutely essential that the electrostatic dischargeability (anti-static) properties of the conveyor belt cover rubber (according to DIN EN ISO 284 test methods) do not exceed the maximum resistance value of 300 MΩ.

Despite the claims of some manufacturers, not all rubber belts are sufficiently anti-static. The key ingredient in conveyor belt rubber is carbon black, which acts as an electrical conductor. It is widely accepted that premium grade belts will contain an optimum level of high quality carbon black whereas belting designed to compete in the lower price range end of the market



Main picture: a Dunlop BV XS conveyor on the left stopped the spread of fire while, inset above, belts with inadequate fire resistance can be expensive!

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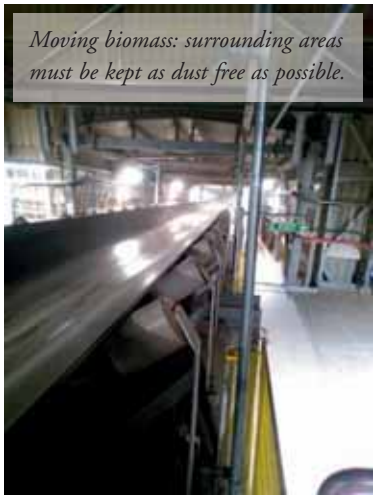
will almost invariably contain less carbon black, often with 'fillers' used as a substitute to keep prices to a minimum.

It is strongly recommended that the belt supplier be asked to provide certification issued by an independent expert body for explosion protection such as DEKRA in Germany, which is the organization that is used by Dunlop Conveyor Belting.

Ozone & UV resistance

Ozone occurs naturally in the upper atmosphere. At high altitude, ozone acts as a protective shield by absorbing harmful ultraviolet rays. However, at low altitude, the ozone itself is a pollutant. Coastal areas and inner cities have particularly high levels of ozone pollution. Exposure to ozone increases the acidity of carbon black surfaces and causes reactions to take place within the molecular structure of the rubber. This can have several consequences such as a surface cracking and a decrease in the tensile strength of the rubber.

Belts that do not operate under shelter are especially prone to surface cracking, which can be extremely detrimental in terms of the performance of the belt and its working life. Even more significant are the environmental and health and safety consequences, especially when carrying biomass because the dust particles penetrate the surface cracks and are then discharged (shaken out) on the return (underside) run of the belt.



Moving biomass: surrounding areas must be kept as dust free as possible.

At first glance, fine cracks in the surface rubber may not seem to be a major problem but over a period of time the rubber becomes increasingly brittle. Transversal cracks deepen under the repeated stress of passing over the pulleys and drums and, if the conveyor has a relatively short transition distance, longitudinal cracks can also begin to appear. Again, surface cracking may not initially seem to be a cause of concern but there are often hidden long-term effects. One of those hidden effects is that moisture as well as oils and resins from the wood waste seep into the cracks and penetrate through the belt covers down to the carcass of the belt.

Ultraviolet radiation causes chemical reactions to take place within rubber and the rapid decline in the ozone layer in the upper atmosphere over the past several decades is allowing an increasing level of UV radiation to reach the earth's surface. Ultraviolet light from sunlight and fluorescent lighting accelerates deterioration because they produce photochemical reactions in rubber that promote the oxidation of the surface of the rubber resulting in a loss in mechanical strength.

EN/ISO 1431 international standards

Dunlop Conveyor Belting was amongst the very first to introduce mandatory testing to EN/ISO 1431 international standards. As a direct result, special anti-oxidant additives that act as highly efficient anti-ozonants were introduced into all of its rubber compound recipes to provide protection against the damaging effects of ozone and ultra violet.

Customers should always insist that their belt supplier provides written verification that their belts undergo stringent conditional testing according to EN/ISO 1431 and are 100% resistant to the effects of ozone and UV. At Dunlop, the pass criteria is that the rubber sample does not show any signs of cracking after 96 hours (@ 20°C, 50pphm and 20% strain) inside the ozone cabinet.

ASTM D 1460 oil resistance testing.

Fire safety

Anecdotal as well as factual evidence gained from laboratory testing certainly indicates that some of Europe's biggest users of conveyor belts, including some major ports, may be using belts that are not as resistant to fire as they are claimed to be. Only the best quality fire-resistant belting for conveyors carrying biomass should be considered.

The first and most important thing to bear in mind is that conveyor belts cannot be totally fire proof. The fabrics used in the carcass of the belt most commonly contain polyester and nylon. These materials have little or no resistance to fire. In other words, every belt will burn when it is exposed to a naked flame that is sufficient to ignite the belt. Using special additives and chemicals, the rubber used in the top and bottom covers that protect the carcass of the belt and the rubber skim between the fabric plies of the carcass can be engineered to resist fire but the complete structure of the belt cannot be made fire proof. In truth, the 'fire resistance' properties of a conveyor belt are actually its ability to self-extinguish.

How long will the belt continue to burn?

EN/ISO 340 testing involves exposing six individual samples of belt to a naked flame causing them to burn. The source of the flame is then removed and the combustion time (duration of flame) of the test piece is recorded. A current of air is then applied to the test piece for a specified time after the removal of the flame. The flame should not re-ignite.

The time it takes for the belt sample to self-extinguish after the flame has been removed is measured. The duration of continued burning (visible flame) should be less than 15 seconds for each sample with a maximum cumulative duration of 45 seconds for each group of six tests. Fire can be carried along a moving belt with disastrous results so the time factor is of paramount importance because it determines how long the rubber will continue to burn before it self-extinguishes. The effects of fire being literally 'conveyed' to adjoining buildings can be seen in some of the photographs.

Even if a manufacturer states that their belt has passed the ISO 340 test, the buyer should still exercise caution. A typical conveyor belt can easily travel more than 40 metres within the 15 seconds sufficient for a belt sample to pass the test. But even ten seconds would still allow the belt to carry flames over a

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

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potentially dangerous distance. For this reason, the required time limit standard in Dunlop is an average of no more than one second, ideally even less. Buyers of fire-resistant belt are therefore recommended to ask to see copies of the manufacturer's test results.

EN/ISO 12882 fire resistance specifications make the distinction between fire resistance with covers ('K' grade) and fire resistance with or without covers ('S' grade). Given the highly flammable nature of biomass, in terms of actual fire resistance, Dunlop recommends that 'S' grade (EN 12882 Class 2B) be regarded as the minimum standard. For conveyors that are in enclosed areas a higher level of fire resistance is needed. Here, Dunlop recommends DIN 22109 part 4, which is Class 4A of EN 12882.

Optimizing safety and economy

The relevance of 'with or without covers' within EN/ISO 12882 (Class 2A and 2B) is that as belt covers wear during their operational life the amount of fire resistant rubber protecting the flammable carcass reduces. The ingredients used to create a fire-resistant (self-extinguishing) and oil-resistant rubber compound almost invariably have an adverse effect on the wear-resistance of the rubber. In plain speak, fire-resistant rubber usually wears faster and, as it wears, then the level of fire resistance reduces accordingly.

However, the rubber compound technicians at Dunlop have proved that it is possible to have the best of both worlds by developing fire- (and oil-) resistant rubber compounds that have extremely good resistance to abrasion. This means that the belt retains its resistance to fire for much longer while at the same time considerably extending its wear life. Unfortunately, laboratory tests have consistently revealed that this is very much an exception to the rule within the conveyor belt industry.

Fire-resistant conveyor belts are a very significant investment so for both safety and value for money reasons, buyers should always request technical datasheets before placing an order because they include data on the level of abrasion (wear) resistance. (NB: for abrasion, higher figures represent less resistance to wear.)

The effects of oil on rubber

Oil (including fat and grease) resistance can be divided into two sources — mineral and vegetable & animal. Biomass, especially the wood and wood waste content, can contain vegetable oils and resins that can have a very detrimental effect on the performance and life expectancy of a conveyor belt.

Over time, the oils and resins penetrate the rubber causing it to swell and distort, resulting in serious running problems. Rather surprisingly, ISO or DIN international standards for oil and grease resistance do not yet exist. Dunlop applies the American ASTM 'D' 1460 standard, generally regarded as being the most demanding standard of its kind in the world.

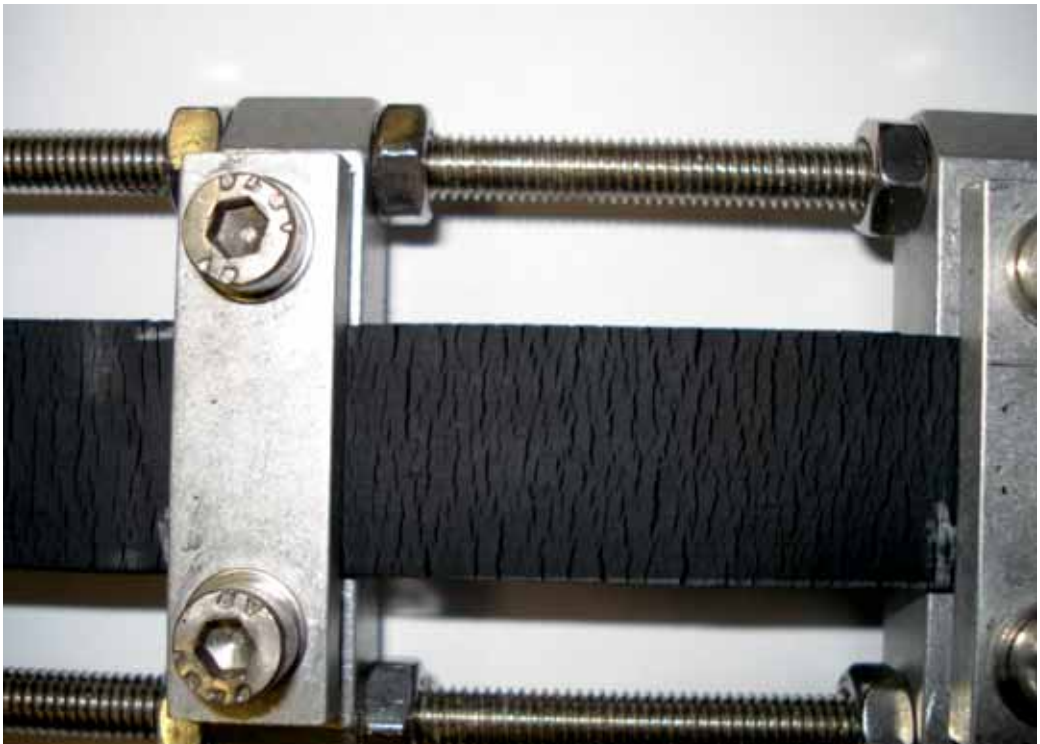
The level of oil and resin present depends very much on the type (origin) of the wood itself.

For most wood from Scandinavia, good resistance to oil is necessary as these trees are mostly pine trees, which have high turpentine content. In South-European countries and in Latin America, eucalyptus trees are commonly used. The wood from these trees contains little or no turpentine so oil resistance is not so essential. This is generally valid for non-pine wood such as poplar and birch. If the origin of the wood used for the biomass can be from variable sources then Dunlop would recommend the use of conveyor belts that have a combined resistance to fire and oil.

As a general rule, belts carrying biomass in open conditions should at least have a fire-resistant standard 'S' grade (EN 12882 Class 2B) combined with a good standard of oil resistance. For these conditions, Dunlop recommends its BVM-S. Belts operating in closed conditions should be EN 12882 Class 4A fire resistant. Here, Dunlop recommends its BV-VT, which is both Class 4A fire resistant and oil resistant (ASTM 'D' 1460).

Perfect storms demand a perfect solution

To summarize, conveyor belts carrying biomass have to face the perfect storm; they operate in highly explosive, combustible environments. They need to be completely anti-static and self-extinguish as quickly as possible if ignited. They convey materials that contain potentially damaging materials in terms of oils and resins. They are under constant attack by the elements including ozone pollution and ultra violet. They have to be safe, reliable and provide an operational life that is as long as possible in order to be economic. Such belts are, of course, available but you need to be absolutely sure of their providence and you need to be as sure as you can be that what the manufacture promises you is actually delivered. When it comes to carrying biomass, belts that are not of the highest standard are a very dangerous and expensive liability indeed.



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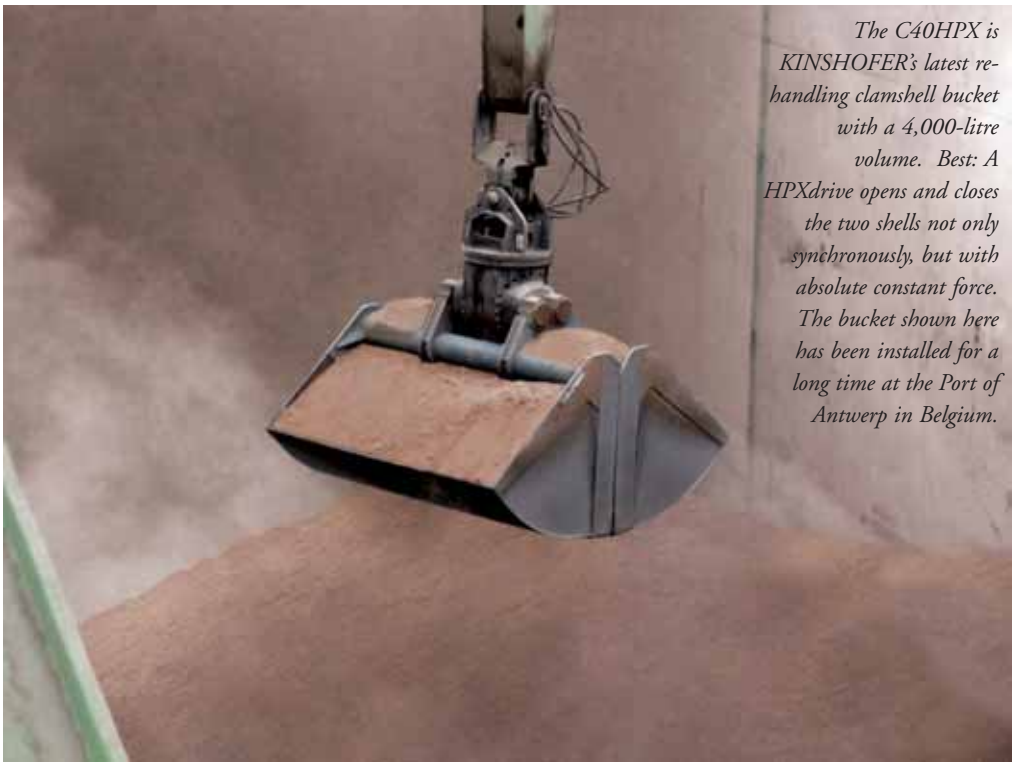
KINSHOFER attachments for biomass handling

KINSHOFER is a leading global provider of high-quality attachments for loading cranes and excavators. Founded 45 years ago, in Miesbach near Munich, Germany, the KINSHOFER Group today comprises 15 companies. KINSHOFER offers a huge product range with just about every type of attachment for equipment carriers — with and without hydraulics.

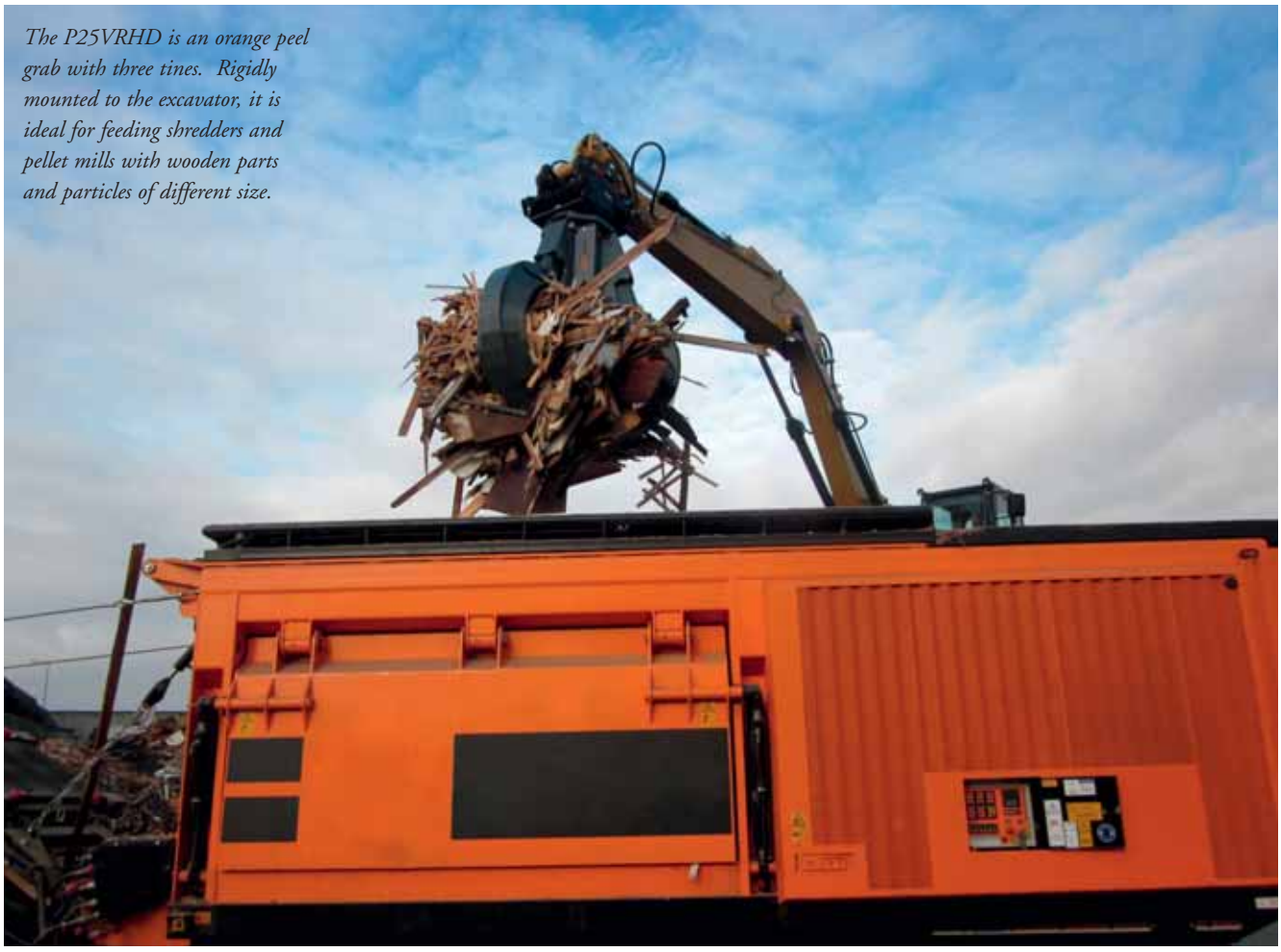
KINSHOFER has an established reputation for excellence in loader crane attachments and, as a global player it is well on its way to achieving the same level of recognition for its excavator attachments. The company offers a wide range of equipment and tools, including just about everything related to attachments — from tiny cable buckets for landscaping construction excavators with just one tonne operating weight, up to giant clamshell buckets and monstrous scrap shears for excavators with up to 100t operating weight!



The C40HPX is KINSHOFER's latest re-handling clamshell bucket with a 4,000-litre volume. Best: A HPXdrive opens and closes the two shells not only synchronously, but with absolute constant force. The bucket shown here has been installed for a long time at the Port of Antwerp in Belgium.

Handling biomass on industrial or harbour sites varies according to what type of biomass is being moved. It is important to select the right attachment for the job.

Wherever giant cranes, pneumatic vacuum elevators (grain blowers) or conveyors are not available or possible, the classic grabbing devices will always be first choice. Attached to an



The P25VRHD is an orange peel grab with three tines. Rigidly mounted to the excavator, it is ideal for feeding shredders and pellet mills with wooden parts and particles of different size.

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The D20H is a selector grab with perforated shells, optimal for grabbing and re-handling green biomass, no matter whether vegetable waste, cut-off grass, bushes or water plants.

excavator, their mobility makes them even more attractive. All of these attachments are available at KINSHOFER's one stop shop.

For dry bulk biomass like grains, sawdust or wood pellets, KINSHOFER is offering the C-series grabs: regular clamshell buckets with larger shells for excavators with an operating weight from 1t to 18t as well as the re-handling and industrial clamshell buckets for excavators with an operating weight from 18t to 80t. Driven by regular hydraulic cylinder(s) or like the C40HPX by the revolutionary HPXdrive: extra compact, extra long lifetime with just an absolute minimum of maintenance needed.

For biomass like agro waste, turf, bark mulch, twigs, small branches or waste wood with particles and parts of different sizes where it needs penetrating tines to grab it, KINSHOFER offers its P-series orange peel grabs for excavators with an operating weight from 16t to 80t.

For non-homogenous biomass like mixed bio waste, waste wood mixed up with soil or fine gravel as well as for wet biomass like water plants, the selector grabs of KINSHOFER's D-series are ideal. The shells are perforated to let water, dust and gravel through; for excavators with an operating weight from 1t to 80t.

For forestry biomass, especially like waste logs or larger branches, KINSHOFER offers its more special wood and timber grabs of the T-series for excavators with an operating weight from 3t to 100t.

The experience that KINSHOFER has gained over decades of developing attachments means that the company now has considerable expertise. This, combined with a strong commitment to premium quality, guarantees a successful future for the group — as well as reliable tools for its customers.

The T20V-6Arm is a special timber grab with 6 tines that can re-handle logs and branches as well as twigs and waste wood. This is only one of ten different timber grab types offered by KINSHOFER.





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En-masse twin chain retrofit gets Brazilian wood products manufacturer running at full capacity

Detrimental impact of misapplied conveying technology on manufacturing output

A Brazilian manufacturer of OSB and MDF wood-based products used en-masse conveyors to move raw materials from off-load, through distribution, and through the manufacturing process. The plant layout and output capacity were designed to generate a final product volume that would provide optimum returns to the company. The positive output was based on a high volume, consistent flow rate of raw materials throughout the facility. The use of en-masse drag chain technology was the ideal selection for this material handling application; however poor design and sizing of the conveyors, complicated by incorrect flight selection, meant the conveyors could not handle the required loads or the characteristics of the material. The material handling challenges lead to conveyor failure and unplanned downtime. After two years of running the conveyors on a continued repair and replace maintenance schedule, the plant decided to seek alternatives. CDM Systems was called to the manufacturing site to analyse the current situation and offer a recommended solution.

Original chain arrangement. Symmetrically swept back flights are an indication of plugging and inadequate flight strength for the loading.

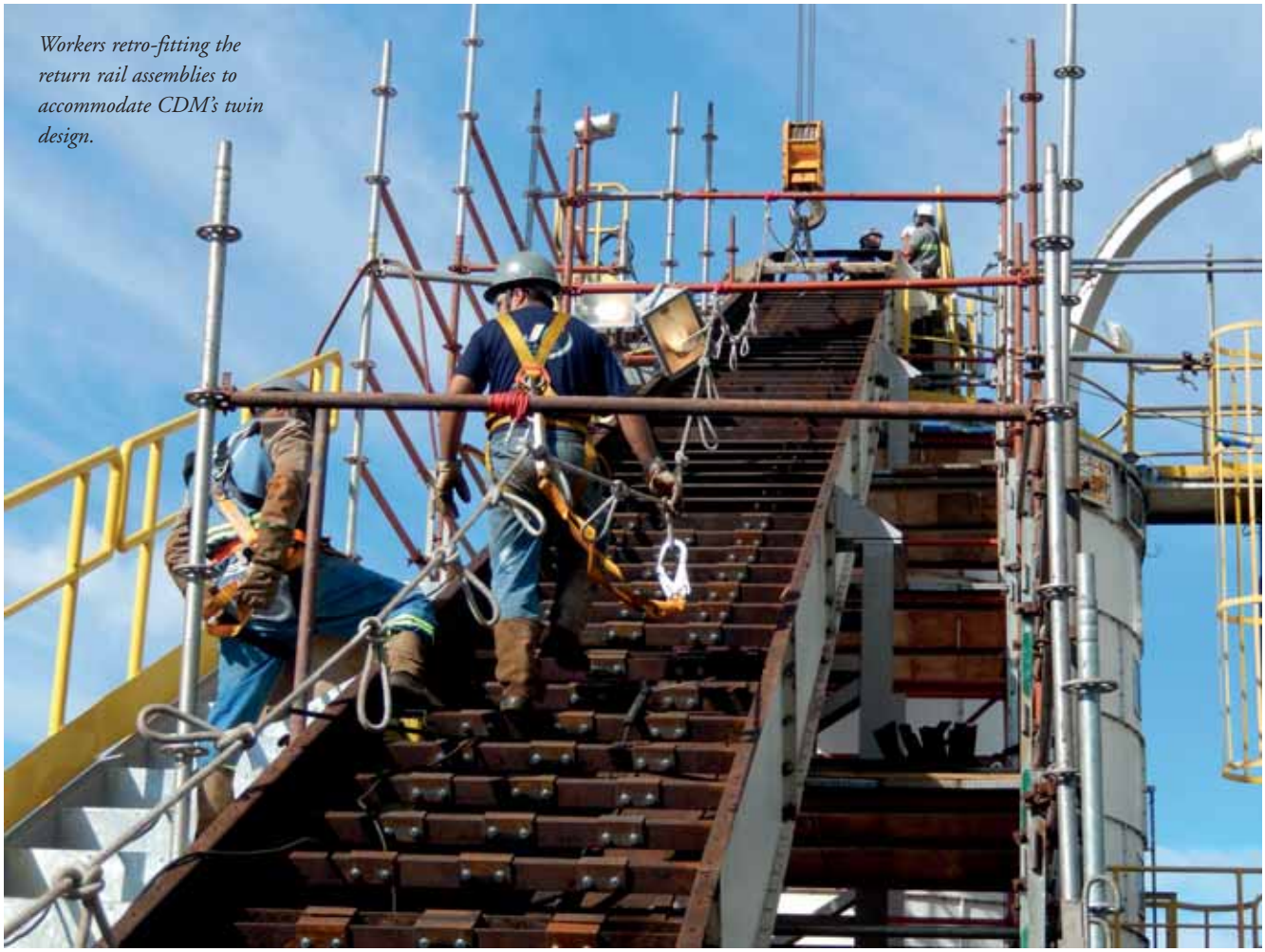
Upon review of the application and applied conveying equipment, the following summary and root cause was submitted to the facility managers.

- conveyors did not meet design capacity criteria;
- improper use and application of chain within; the conveyor;
- undersized and improperly applied gear reducer selection and
- poorly designed conveyor housing and return system for the conveyor.

CDM was asked to redesign conveyors that would meet the production goals of the plant while keeping retrofit costs low. The facility management stipulated CDM to work with the existing equipment to implement improvements and eliminate the conveying problems.

The first issue addressed by the CDM design team was the inability of the existing conveyors to meet the required capacity. The conveyors are required to handle the full volume of chips/flake the plant produced. The deficiencies of the conveyors left the plant limited to approximately 80% of the design capacity. The primary conveyor should have been sized to handle product from six flakers; however, each time the wood product manufacturer attempted to operate all six of the flaker units, the conveyor immediately plugged and shut the

Original 50" wide flights bent from foreign material or an upset condition.



Workers retro-fitting the return rail assemblies to accommodate CDM's twin design.

plant down.

A design analysis of the conveyor cross sectional area (volume) determined the conveyors were significantly undersized. The solution for this conveying problem would typically be to increase the chain speed or to provide a complete replacement of the conveyor. However, CDM was able to address this design flaw by increasing the sidewall height of the conveyor through the use of formed channels which were bolted to the existing conveyor sidewall. These extensions, combined with raising the chain return rail elevation, provided the increase in area required to meet the design capacity without increasing chain speed.

The second material handling challenge CDM looked to overcome was the continual conveyor stoppage due to component failure. The existing conveyors in the facility were constantly failing due to chain damage, bent chain flights, broken chain, and excessive wear. The component failure was compounded by the lack of safeguards designed to mitigate the damage following the failure.

CDM addressed these issues with minimal cost to the facility's retrofit budget by adding a zero speed switch to each conveyor. The switch, coupled with the addition of a CDM exclusive Kick-Out End Flap, serves as a plug chute and chain break indicator. The use of the two added sensors would significantly reduce the damage and associated downtime from an upset condition.

Another conveyor design issue identified by the CDM engineering team was the misapplication of the chain. The chain pull and ultimate strength did appear to be calculated and applied accurately; however, the conveyors were designed with a single strand chain with a 50" (1,250mm)-wide flight. This flight design was too wide a span for a single strand conveyor. The tip strength of the flights could not withstand the forces of the product at the design capacity without deflection. This design flaw left the conveyors vulnerable to continued failure during normal operating conditions and potential catastrophic failure in an upset condition. A seemingly obvious fix would be to simply increase the flight thickness to increase the flight tip strength. However, increasing the thickness of the flights would lead to greater lateral forces on the chain and result in more chain breaks and failures in place of the bent flights. While bent flights are inconvenient, they do not typically lead to a shut-down like a broken chain.

Engineered chain proves reliable

CDM had two options to correct this design flaw. The first choice was to offer a conventional dual strand chain where two strands of chain would be installed with a common flight connecting the two strands. While this is not an uncommon arrangement, it was not the design option CDM recommended for the following reasons;

- Regardless of chain manufacturer, type of chain, alloy of chain or style of chain. No two strands of chain will ever wear or elongate at exactly the same rates. With a conventional dual strand arrangement this is a critical consideration as once this uneven elongation occurs you have effectively changed the chain sprocket centers. As the chain engages the drive shaft sprockets it is not contacting the sprockets correctly or if uneven elongation is sever enough will not engage at all. This will lead to a failure. Chain elongation becomes an even greater issue when the conveyor has a long run; which means more links in the conveyor.
- When a conventional dual strand conveyor is used, if a flight becomes bent due to upset condition or foreign material the

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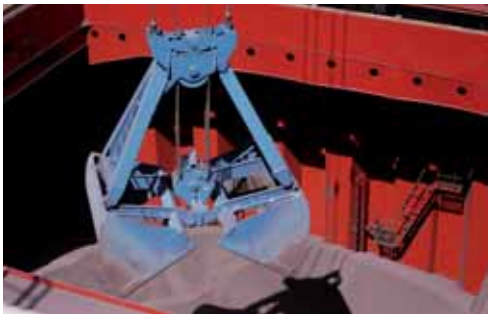

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sprocket centres have again been changed. This will result in conveyor failure when the chain engages the sprockets.

Many of the conveyor lengths were in excess of 150ft (46m). At this long span, CDM knew the dual strand design would not be the best selection for this application. Instead, CDM proposed its exclusive Twin-Strand design. The CDM design combines the capacity advantage of a dual strand with the reliability of a single. Instead of a conventional dual strand where the two strands of chain are connected with the chain flight; the CDM Twin-Strand design uses two independent single strands of chain within the same conveyor housing. Like a dual strand, the twin design uses a common drive shaft, where both strands of chain are driven through a single drive package. Unlike a conventional dual strand, the Twin-Strand design is provided with independent take-ups/chain tensioning. The result is a conveyor which combines the capacity advantages of a dual strand conveyor with the long-term operational reliability of a single strand conveyor into a single piece of equipment. The use of the CDM Twin-Strand design provided several key benefits for the application:

- increased chain strength;
- increased chain flight strength;
- eliminated issues from uneven elongation; and
- virtually eliminated bent flights.

Upon design completion, CDM provided the wood product manufacturer detailed fabrication drawings of the modifications required to the existing conveyor to accommodate the conversion. The drawings allowed the company to hire a local contractor to perform the fabrication and installation. The use of local subcontractors saved thousands of dollars in shipping costs and taxes/tariffs on US supplied components. CDM also supplied fabrication details and design criteria for the terminal station retro-fit which were required to accommodate the Twin-Strand design.

The original gear reducer selection for the conveyors was provided with virtually no service factor based upon the output torque required for the conveyor. To support the full capacity of manufacturing output and the new Twin-Strand design, CDM engineered and specified a new drive package (reducer/motor). The new package could be purchased locally and would support the full material handling requirements of the plant.

A SUCCESSFUL RETROFIT BASED ON EXPERIENCE AND PARTNERSHIP

The communication and partnership between CDM Systems and the Brazilian wood product manufacturer solidified the success of the retrofit material handling project. The CDM design team relied on the more than 40 years of experience in bulk material handling and en-masse conveyor design, to analyse the failed conveying system in the plant, to listen and understand the goals of the manufacturer to keep retrofit costs low and production at peak levels, and to collaborate with their Brazilian customer to provide detailed work instructions and component specifications to keep the project on schedule and eliminate unnecessary tariffs. Since the completed retrofit, the manufacturer has reached full production targets and has improved their bottom line. The success of the project has also led to two sister-companies of the wood product manufacturer to contact CDM for assistance with their struggling conveying system.

Conveyor modification and retrofit to CDM twin chain nearing completion.

Customizable dust suppression for specialized applications

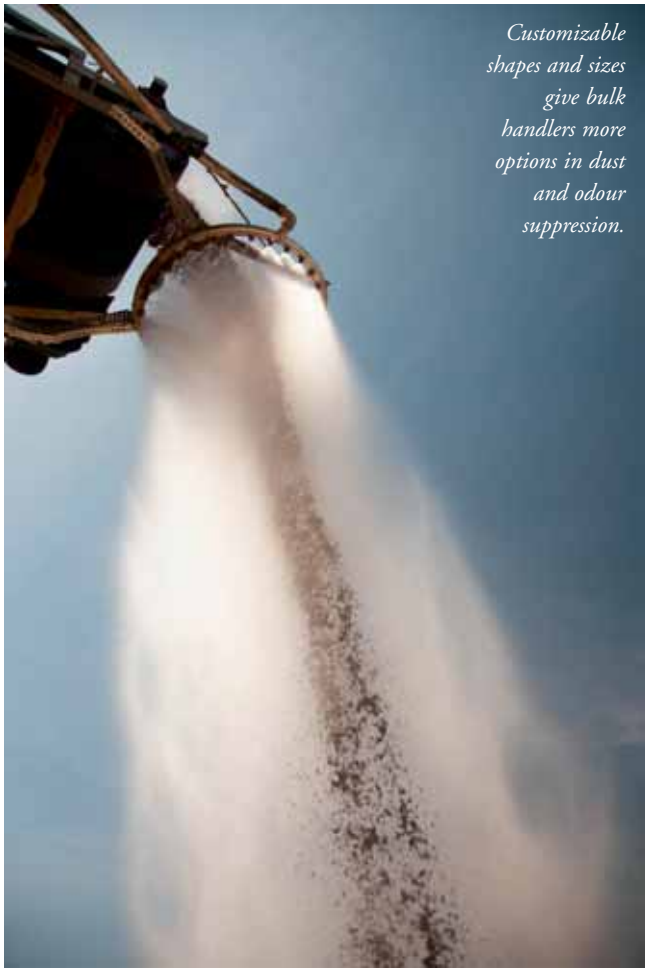
Dust Control Technology® (DCT), an industry expert in open area dust and odour, control has introduced a technology that allows the delivery of atomized mist solutions in customizable shapes and sizes, giving manufacturers and bulk handlers virtually unlimited options in dust and odour suppression, handling materials including biomass. DCT is complementing its existing line of stationary dust suppression rings with the ability to produce geometric shapes, bars or other configurations, customized to the needs of the specific application. Each design is specially-engineered for the application and equipment of the individual customer for superior dust management.

The new technology can create a virtually unlimited array of shapes and sizes, including the DustBoss® DB-R ring, which creates a curtain of mist around the cargo stream or specified area for outstanding containment of fugitive dust or odour. The customized solution offers high-volume applications such as radial stackers, crushers and screeners more focused and reliable suppression, taking the technology beyond perforated hoses and basic spray nozzles. The company has also developed the ability to supply custom spray bars and shapes under the DustBoss® DB-B family of spray bar products.

"This capability was developed in response to several requests by clients seeking a viable area-specific solution," said DCT President Laura Stiverson. "We've found that the most effective dust suppression approach involves identifying where in the industrial process fugitive dust is produced and customizing a solution that contains it at the point of emission."

Customers can request a virtual site assessment to determine the optimum size and shape of a customized ring, working with experienced personnel to design a tailored system. The assessment includes such details as material properties and volume, width/length/speed of conveyors, pulley diameter and slope. DCT can also produce customized shapes from customer drawings, depending on the size, geometry and complexity.

The technology can create a curtain of mist around a specific area for outstanding containment of fugitive dust or odour.



Customizable shapes and sizes give bulk handlers more options in dust and odour suppression.

The objective in atomized mist technology for dust suppression is to induce as many collisions as possible between the dust particles and the droplets, causing an agglomeration effect that weighs down the solid particles and drives them to the ground. As airborne dust particles and water droplets approach each other, the best chance for a collision is created when they are roughly the same size, avoiding a slipstream effect that can carry them past one another.

The force of the slipstream is relative to the size and speed of the droplet. When smaller airborne particles encounter a large droplet, they can get caught in the slipstream, causing them to move around the droplet rather than being absorbed by it. Because atomized mist technology creates similar-sized droplets that are able to travel with dust particles on natural air currents, the chances of collision and absorption are increased, allowing the collective weight to drive particles to the ground.

Customizing a solution

At the core of the technology, water is pumped into a stainless steel manifold and atomized by a series of specially designed nozzles that fracture the water into a cascading mist. The water can be supplied by standard municipal sources or a hydrant, feeding a hose sized for the application and connected directly to male pipe threads on the manifold. To avoid premature clogging of misting nozzles, facilities that draw from non-potable water sources can employ additional filtration systems.

"Custom rings and spray bars can be equipped with a pump that is matched to the specific device and the service conditions under which it must operate," said Stiverson. "Options include a complete plug-and-play system with its own control panel, as well

as the ability to tie in to a customer's existing controls. For applications that require surfactants, a dosing pump can be included in the design to precisely meter additives."

No two applications are alike

Engineers at DCT have created custom systems for a variety of different industries, from aggregate to recycling to coal. With the launch of the customization programme, the company is equipped to engineer systems of nearly any size and configuration.

"This product family was created to fulfill unmet customer needs, but it also helps protect workers and the surrounding community from industrial dust and odour," Stiverson concluded. "We want all of our customers to have a solution that fits their individual needs, contributing to health and safety, good community relations and regulatory compliance."

The company has positioned itself as a complete solutions provider for dust and odour control, able to deliver a level of customer service that is difficult to match from suppliers that provide a broad range of equipment. By specializing in atomized mist technology for dust and odour control, DCT has built a reputation for outstanding customer service and industrial-strength equipment designs that address even the largest and most difficult applications.

Dust suppression rings can be engineered for unique applications and equipment.

Dust Control Technology is a global expert in dust and odour control solutions for coal, demolition, slag handling, landfills, recycling and many other applications. The company designs and manufactures customized equipment utilizing atomized mist technology for dust suppression and odour management. All of the firm's R&D, experience and expertise is centred completely around those applications, and its staff helps customers analyse particle sizes, working environments and other factors to ensure effective performance under real-world conditions. The units are far more effective and efficient than manual spraying, with some customers realizing payback in less than six months. DCT equipment can be purchased outright or rented from an extensive fleet.

Dust control rings can be customized for specific requirements, such as discharge chutes.

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Effective utilization of alternative fuels with Bedeschi systems

The utilization of alternative fuels within various industries has been on a path of rapid expansion for the last 20 to 30 years, *writes Pietro de Michieli, Chief Operating Officer – Bedeschi Spa*. For instance, cement producers have been pushing for a net negative fuel cost for decades, which only a few plants have truly achieved and the Southeastern US has recently become the hotbed of biomass-based fuel sources for power generation or co-firing. As the world attempts to reduce its dependence on fossil-fuels, what was once considered waste has now become a driver for a rapidly expanding industry which is attempting to combat the global megatrend of climate change and resource scarcity.

The recent past

As recently as 1986, Kurt E. Peray suggested that solid fuels in rotary kilns were generally coals: anthracite, bituminous, lignite and coke, and that "several pre-heater kilns in various parts of the world are being used to dispose of old automobile tyres, wood chips and even garbage for introduction into the back end of the kiln".[1]

Alternative fuels have now taken their place in the proverbial front end of the kiln. The times when focusing on alternative fuels purely for financial reasons are over. Yes, they still have their place, but a far larger constant has been added to the equation: new emissions regulations.

In 2010, the US EPA finalized the National Emission Standards for Hazardous Air Pollutants (NESHAP) amendments to the standards for Portland cement manufacturing and emissions of mercury, total hydrocarbons (THC), hydrochloric acid (HCL) and particulate matter (PM). In 2013, these new regulations became law. This updated law, coupled with the New Source Performance Standards (NSPS) regulates NOx, (nitrogen oxides) and SO_2 (sulphur dioxide), and required cement plants to be compliant with the new standards.

After a round of lawsuits, modifications and amendments, mostly championed by the Portland Cement Association, all US cement plants should have demonstrated compliance as recently as 9 September 2015.

But there's more. In August of 2015, President Obama authorized the new Clean Power Plan to regulate CO_2 emissions from power plants. With the new emphasis on Greenhouse gases and their supposed contribution to global warming, can the cement industry be far behind?

Going back to Peray, utilizing coal as a fuel source under stoichiometric conditions in a cement kiln would lead to approximately 18% CO_2 in the stack if there were no evolution of CO_2 from the raw mix and as much as 28% when considering the CO_2 evolving from the raw mix.

By their very nature, numerous alternative fuels and raw material additives have reduced chemical constituents that lead to a reduction of overall emissions, reduced fuel costs and the possibility of generating carbon offsets.

Today, wood chips and biomass usage for one of the major world-wide cement producers contributes as much as 24.5% of their fuel input needs[2]. Consequently, the low heat values of alternative fuels now require larger handling and storage systems that are more flexible and permanent fixtures within the plant.

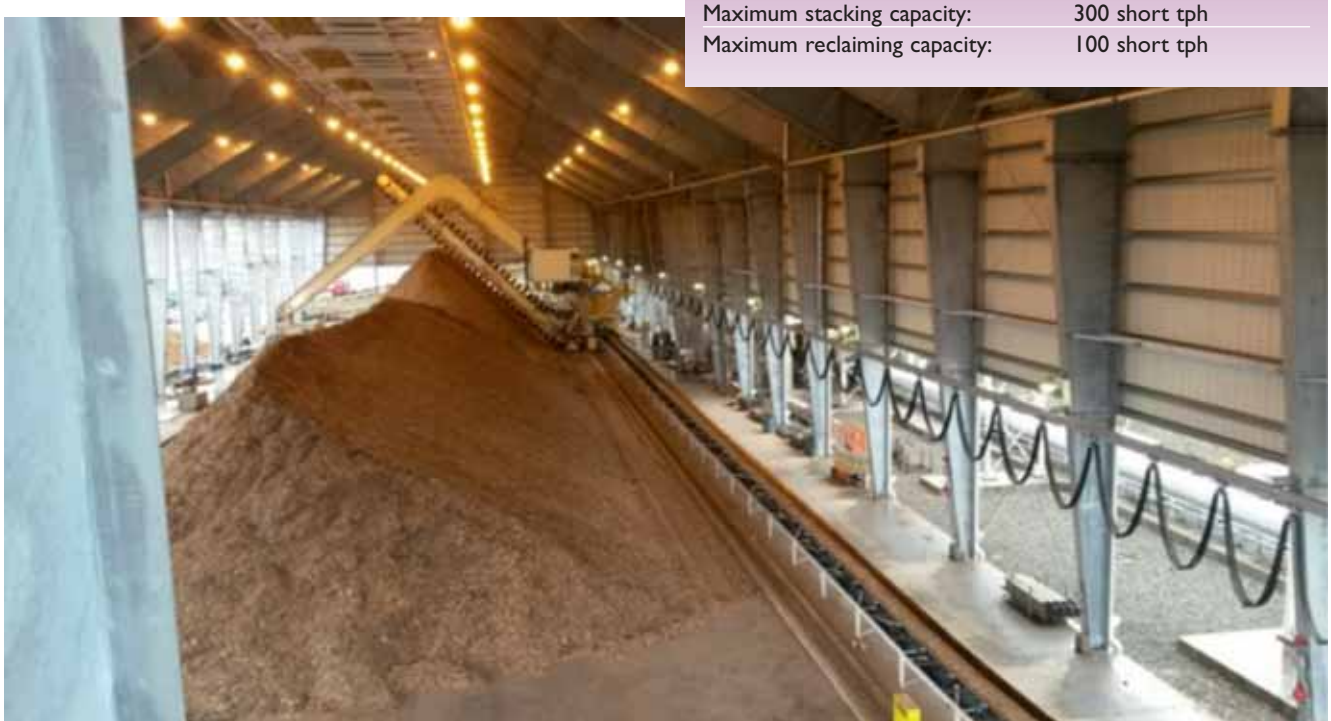
Case studies

Plainfield Renewable Energy/Enova Energy Group

The Enova Energy Group embarked on a renewable energy project in Plainfield, Connecticut in 2011 to generate 37.5MW of clean energy utilizing waste wood from construction and demolition debris, recycled wood pallets and land clearing

PLAINFIELD PROJECT DATA

Material:	Biomass
Bulk density:	17–24pcf
Material size:	4in
Moisture content:	20% (surface moisture)
Angle of repose:	45°
Total volume stored:	4,800t
Volume of pile body, no endcones:	4,400t
Number of piles:	1
Section of piles:	1,225ft^2
Total length of pile:	500ft (toe to toe)
Width of piles:	70ft
Height of piles:	35ft
Maximum stacking capacity:	300 short tph
Maximum reclaiming capacity:	100 short tph



1: Kurt E. Peray (1986) The Rotary Cement Kiln, *Second Edition, Chemical Publishing, pp 38, 57-58.*
2: Azad Rahman, M.G. Rasul, M.M.K Khan, S. Sharma (2013). Impact of alternative fuels on the cement manufacturing plant performance: an overview. *5th BSME International Conference on Thermal Engineering.*

MIDDLE EAST CEMENT PLANT PROJECT DATA

Material	Coal	Petcoke	Oil shale	Olive residue
Bulk density (t/m³):	0,8	0,9	0,8	0,44
Grain size (mm):	68	68	200	140
Moisture (%):	12	12	6,5	18
Resting angle:	38°	38°	38°	27°
Stored volumes (tonnes):	3 × 10,000	2 × 7,000	2 × 1,500	2 × 1,500
Section of piles (m²):	187	187	187	122
Total pile length (m):	75	50	24	38
Width of piles (m):	31	31	31	31
Height of piles (m):	12,1	12,1	12,1	7,9
Stacking rate (tph):	200			
Reclaim rate (tph):	150			

materials. The biomass plant features a wood storage yard, fluidized bed gasification system, condensing steam turbine generator, cooling tower, ash silo, scrubber, bag house, electrical switchyard, storm water storage and treatment and balance of supporting plant systems.[3]

Bedeschi America, Inc., was selected for the fuel handling system consisting of an overhead tripper/stacker and a portal reclaimer. Prepared fuel is delivered to the plant where the covered storage hall can house five days of fuel.

The Bedeschi (TRP 9/1200) overhead tripper stacker utilizes a 1,200mm belt and the (PAL P200/21+4) portal reclaimer has blades with a length of 2m and boom length of 25m.

Due to the potential of wood dust explosions, Bedeschi was required to supply Class 2/Div 2 electrical equipment, namely motors, switches and pump skids.

Middle East cement plant

A Middle Eastern cement company asked Bedeschi SpA to propose a multi-fuel handling system for its facility which is capable of handling a diverse array of fuels. The system comprises a receiving feeder, storage facilities and a bulk handling system complete with dust suppression.

The fuels to be handled are: coal, petcoke, oil shale and olive residue.

The alternative fuels arrive via semi-truck and are loaded onto a surface feeder to an optional double roller crusher for sizing of the fuels, if required. From there, the fuels travel via belt conveyor to a tripper/stacker to properly build the nine piles of fuel. In total, 50,000 tonnes of fuel are housed within the storage hall.

Given the diversity of moisture within the fuels, a bucket-type portal reclaimer was determined to be the most effective for the duty. As is standard, Bedeschi prefers to utilize a bucket-type reclaimer when the moisture is in excess of 12%. In the case of this project, the fuels require minimal mixing and Bedeschi's reclaimer affords quick pile changes.

Bedeschi supply to include:

- CNT 14/2500 surface feeder;
- RL 450/1500 double roller crusher (optional);
- STK 22/800 stacker;
- BEL P 250/30+4 reclaimer;
- NG: 800/584 , 800/507, 650/104, 650/269 belt conveyors;
- Bag Filter (ATEX): 120 BV 100, 120 BV 64, 120 BV 64; and
- electrical, automation and controls.

3: Leidos, Inc. website pages.

GOB AS A FUEL

GOB is a waste coal that is the low-energy discards of the coal mining industry. These waste coal piles accumulated mostly between 1900 and 1970 in western Pennsylvania, West Virginia and Kentucky.[4] These piles can contain millions of tonnes of low calorific value fuel that can potentially be recovered and processed in coal-fired power plants or other energy intensive pyro-processing systems.

The Virginia City Hybrid Energy Center is just one example. The 585 megawatt coal-fired power plant will be generating electricity from millions of tonnes of waste coal that was not previously marketable.[5]

This project proved how just important the material assessment is. From the table below, one can see that the material as described by two of the owner's engineers seems reasonably benign. Based upon this, the decision to provide a blade-type reclaimer was taken. Commissioning issues quickly led to a further and more complete investigation into the true nature of the material.

The investigation revealed that the material being received at the plant contained a much as 32% clay. The clay tended to be non-flowing, highly compactible and exhibited angles of repose between 75° and 90°. The clay prohibited the coal from flowing from the secondary 'pusher' boom to the primary reclaim boom. In addition, the compact clay forced the reclaim blades in to a more aggressive digging-mode, which exerted additional stresses and ultimately caused cracking in the blades.

Ultimately, Bedeschi proposed a fix for the blades and the customer has more proactively managed its fuel resources. Given a proper evaluation of the materials, Bedeschi's equipment choice would have been a bucket-type reclaimer, and these issues would not have arisen.

Bedeschi America's scope includes:

- STK 31/1200 dual stacker with tripper;
- PAL P 260/22+12 dual portal reclaimers;
- cabin with control panel; and
- electrical, automation and controls.

4. Energy Justice Network, website pages

5. Bristol Herald Courier, *Gobco mining coal waste piles, turning gob into cash. website, posted March 7, 2010*

VIRGINIA CITY PROJECT DATA

Material:	Coal GOB
Bulk density:	50–65pcf
Material size:	2in
Moisture content:	9%
Angle of repose:	38°
Total volume stored:	72,000 tonnes
Number of piles:	2
Section of piles:	3,035ft^2
Total length of piles:	1,253ft
Width of piles:	125ft
Height of piles:	48.5ft
Max. stacking capacity:	950 short tph
Max. reclaiming capacity:	950 short tph

SUMMARY

Today's focus on environmentally fuels and raw materials means that it is necessary to overcome ever-increasing challenges in the field of material handling. For over 100 years, Bedeschi has been handling sticky and high moisture clays for the tile and brick industries and continues to invest in product development to increase efficiency and enhance its product line for its customers worldwide. The global needs for common fuels of today and the anticipated fuels for tomorrow requires an ever diligent company like Bedeschi to keep abreast of difficult material handling issues.

Hycontrol blocked chute detection systems ensure it's 'all systems flow' at biomass power station

High-temperature Microsense blocked chute detection systems supplied by Hycontrol are playing a crucial role at a large UK biomass power station, which is fuelled by poultry litter. The installation of the microwave-based systems followed successful trials on one of the six chutes feeding the poultry litter biomass into the main furnace.

Given the sticky characteristics of this type of biomass and high operating temperature environment, which can reach of 220°C, measuring flow in the chutes poses a number of challenges. The original paddle switches tasked with this job were located inside the chutes in direct contact with the biomass. This resulted in the paddle blades regularly becoming coated in material, making them unreliable and prone to malfunction. As a direct consequence there were frequent blockages causing serious disruption to the power generation process. Any unchecked blockage could take several hours to clean up, at an approximate cost of £1 per second — nearly £4,000 an hour!

The plant operator required a measurement system that could monitor 'flow-no flow' conditions in the chute and would also give them warning of an imminent blocked chute. Hycontrol has extensive experience in difficult blocked chute applications using its Microsense microwave-based technology and were confident they could provide a long term reliable solution. To validate its claims, Hycontrol proposed a trial of its equipment on one of the chutes.

A key advantage of this low power microwave technology is that neither the transmit or receive sensors have to be mounted directly in the chute and so do not come into contact with the material. The sensors can be mounted opposite each other behind sacrificial microwave-transparent windows fitted into the sides of the chutes. These do not obstruct the material flow and the sensors continue to operate even when there is a build-up of material on the sides of the chute. During operation the transmitter emits a continuous, low power, microwave beam to the receiver and an output relay is energized or de-energized when this beam is obstructed by the material being monitored.

For this high-temperature application, PTFE windows were used, providing a maximum operating temperature of 240°C. The windows can easily be replaced if they become damaged or worn. Unlike expensive nucleonic technology used for blocked chute detection, the low power microwaves pose no danger to plant personnel. Systems are extremely easy to fit and have an operating range of up to 40 metres.

Hycontrol's UK Sales Manager David Wadsworth is clear on the benefits the Microsense systems have brought for the day-to-day operation of the power station: "During the trial, the chute with the microwave switches and a neighbouring chute both experienced blockages. The chute with the Hycontrol switches took the customer less than ten minutes to unblock, whilst the chute that was relying on the old paddle switch took over an hour because the delay in triggering an alarm had allowed the blockage to escalate.

As a direct consequence Hycontrol systems were purchased for use on the remaining five chutes. The complete system has now been integrated with the site PLC, and is configured so that in addition to an alarm highlighting the detection of a blockage, the 'no flow' detection will also trigger an alert indicating there may be material bridging further up the chute preventing material flow. This is just one of many examples across a wide range of industries, which illustrates the flexibility and durability of our microwave technology."

RBL-REI biomass offers turnkey biomass storage and handling plants

French bulk handling specialist RBL-REI has a range of installations in all parts of the world, including projects for the handling of biomass cargoes.

RBL-REI has succeeded in transforming itself into a turnkey supplier of bulk handling equipment, supplying machinery for all parts of the supply chain — from the quarry to the port. RBL-REI supplies a large proportion of all harbour equipment in France, and maintains a strong position in its field.

Recent biomass contracts

A recent contract for RBL-REI is a turnkey installation at a port in Martinique – Fort de France. It includes the supply of a ship reception system including a 35m³ de-dusting mobile hopper, belt conveyor transfer to the 20,000m³ biomass storage plant, including elevator and tower truck-loaders. The plant is operated by an electricity producer. The power station (40MW), the first 100% biomass cogeneration plant in Martinique, will supply 15% of the island's total electricity consumption.

RBL-REI has used its expertise and experience to develop this handling system, which includes studies and calculations, manufacture of the equipment, on-site transport as well as assembly of all equipment.

This contract is nearing completion, and, at the time of writing, RBL-REI is finalizing assembly and plans to run cold tests at the end of this month (May).

RBL-REI had to meet stringent environmental regulations, including: noise reduction achieved by double-skin cladding; ATEX requirements; and the entire system is equipped with dust-control equipment and a firefighting system. In addition, the installation had to meet seismic standards and be able to withstand cyclones.

RBL-REI has adapted its equipment to meet all of these challenges.

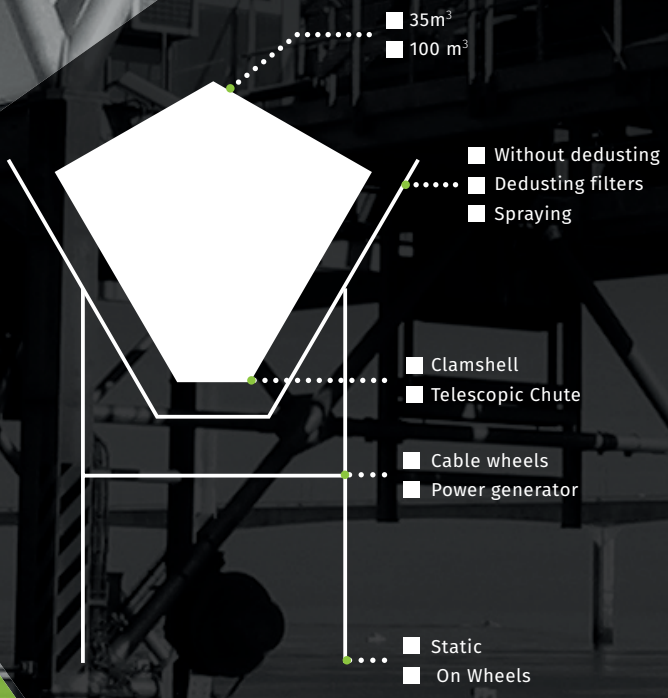
RBL-REI has also recently handed over a turnkey installation feeding a new biomass boiler in Gardanne, France, to create a total electrical power of 150MWhe. This system will store 30,000m³ of biomass (class A and B), and create a storage facility with a log storage capacity of 73,000m³.

This turnkey system will be separated into two units: the power plant with the woodchip handling and storage system; and the 'La Mounine' site with the log storage facility and crushing unit. This installation can receive

RBL REI

BULK UNDER CONTROL

MULTI-BULK HOPPER



GENERAL CHARACTERISTIC		
Util capacity	35m³	100m³
Feeding height without dedusting filters or with spraying	10m	11.5m
Feeding height with dedusting filters	12m	13m
Opening diameter without dedusting filters or with spraying	7m	9.5m
Opening diameter with dedusting filters	5.5m	8m

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24 trucks per hour for class A biomass and four trucks per hour for class B biomass. The storage capacity has a flow rate of 3,200m³/h, and feeds the boiler at speeds of up to 900m³/h.

For this installation, RBL-REI had to include the supply of civil works; electricity and automation; dust removal; sampling unit; and a fire-detection and -fighting unit to cover the entire installation.

In order to ensure the primary aim of supplying biomass to the boiler continuously to ensure electrical production, RBL-REI faced a wide range of challenges, all of which it met while developing the complete installation.

In the field of energy, RBL-REI has also been involved in the development of a system to produce second-generation biofuel made from biomass and pellets.

RBL-REI has participated in the engineering, supply and construction of two pilot units, the first of which is used for the torrefaction of the raw material (straw granules, wood chips and all types of cellulose-based products).

Straw bales and woodchips are processed automatically, from unloading, defibration, granulation, torrefaction, stocking to truck loading.

The second unit is directly connected to the first, and the product is transported between the two sites by trucks.

This unit receives the trucks through an RBL-REI-designed off-ground broadband unloader, handling various loads such as products from the first site as well as fossil products (petcoke and coal).

The products are transported to the storage cells thanks to RBL-REI 's 'ZZbelt' sandwich belt conveyor. Each product is then transferred to the micronization unit and then to a dedicated storage cell via a pneumatic conveyor.

Before sending to the gasifier, the product is mixed to create a recipe defined by the researchers attached to this unit of production.

AGI reports on latest biomass-handling contracts

Ag Growth International (AGI) is a major manufacturer of grain and fertilizer handling, conditioning and storage equipment. In addition to grain handling, AGI participates extensively in processing industries such as milling, oil seeds, ethanol, biomass and industrial applications and applies many traditional grain handling techniques to this industry.

AGI's company approach is driven by strong global agricultural fundamentals and its brands are amongst the most recognized in global agriculture in both commercial and farm sectors. Its vast and growing product catalogue includes augers, belt conveyors, grain storage bins, grain handling accessories, grain aeration equipment, grain drying systems, and fertilizer handling and storage systems. AGI has manufacturing facilities in Canada, the United States, Brazil and Italy and distributes its products globally.

In 2016, AGI saw several projects relating to the biomass industry. This included one notable project contacted by a US pellet producing company called Colombo Energy out of Greenwood, SC, site engineering by Prodesa. The Colombo site is a wood pellet manufacturing plant that has the manufacturing capacity to produce 460,000 metric tonnes of pellets annually and is set to be one of the largest wood pellet mills in the US, and is scheduled to open this autumn.

The site features several TRAMCO pieces including; two bucket elevators; four Bulk Flo chain conveyors; five Model RB chain conveyors; and 19 Model G conveyors. The purpose of the conveyors on this site is to handle woodchips, wood fibre and wood pellets. As well, the site includes; three Airlanco AVR receivers, one Cyclone used to handle air/dust at the wood chip and pellet storage location of the plant and a Westfield Portable Auger used for reclaiming wood fibre and pellets.

New technological developments include a project done using the Tramco Bulkflo line. A single conveyor was implemented in place of a more traditional conveyor for bucket elevator to conveyor operation. The simplified design allowed more efficient handling of woodchips and wood fibre. The Tramco Bulkflo conveyors moved woodchips to Hammermills. The wood fibre was then moved from the Hammermills to the storage bins and finally to the pellet mills.

Aside from Colombo Energy, AGI has had activity this year with several other businesses including; Georgia Biomass, ICM Inc., Drax, Bruks and Green Plains Renewable Energy. DCi

Building his own story

Five Rivers Distribution expands bulk material storage capacity with Legacy fabric buildings

Marty Shell isn't one to simply sit back and enjoy success. As with many second-generation operators of family-owned businesses, there's a point of pride in not only continuing what the first generation established, but also making it bigger and better — and Shell certainly fits that mould.

His father, the late Buck Shell, started in the port/terminal business in 1969 as manager of the Pine Bluff Fort before quickly moving up the Arkansas River in 1970 to start the Fort of Port Smith. In 1982, he was named vice president of Pine Bluff Warehouse Company, where he oversaw seven Arkansas ports. And then in 1996, Buck ventured out to found his own company.

Five Rivers Distribution was established as an intermodal warehouse facility with locations in Van Buren and Fort Smith, Arkansas. Conveniently positioned for the Arkansas River System, the company today has a total of five handling docks for unloading barges, and is also served by the Union Pacific and A&M Railroads.

Within close proximity of Interstates 40 and 540, Five Rivers also runs its own trucking company, completing a trifecta of transportation options coming into and going out of its US. Customs bonded warehouse. All totalled, the operation stakes claim to about 300,000ft^2 of storage space for warehousing and bulk materials.

Marty Shell has been anything but a complacent president as the company enters its third decade of operation. A few years ago, the need for additional warehouse space — along with a desire to invest in capital improvements that would enhance Five Rivers as a whole — prompted Shell to add a 10,000ft^2 fabric building right near an existing 16,000ft^2 tension fabric structure at the Van Buren site that had been constructed about six years previously.

Due to the natural corrosion resistance of the fabric material, the buildings are primarily used for storage of salt and other corrosive materials, but are also housing any and all other commodities.

"Before we got the first one, the idea of a fabric warehouse sacred me to death," said Shell. "But they've stood the test of time against wind, snow, hail, sunlight. I'm a believer now that it's clearly the right building material for the application."

It wasn't long before Shell was again looking to add a new fabric structure. Satisfied with his prior purchases but also curious about other options, he consulted with friends upriver at the Port of Catoosa in Tulsa, Oklahoma, where a massive fabric salt storage building had been installed a couple years earlier by Legacy Building Solutions.

"They were very pleased with the Legacy building," said Shell.

"And I knew they had really done their homework before deciding to go with them. I trust their knowledge, so I took the recommendation and gave Legacy a call."

Having already purchased two fabric structures in the past, Shell was familiar with the construction process and knew he would be acting as a general contractor, subbing out the dirt work and concrete himself. All that was left was to establish a comfort level with the building manufacturer that had been suggested.

"I spoke to Paul Smith at Legacy, and he was a very nice, knowledgeable man," said Shell. "He really sold his company well. We obviously had contracts, but the overall feel was kind of like the olden days, where you felt you could just take somebody at their word. Everything that Legacy said they were going to do, they did."

While the business relationship may have made Shell nostalgic for the old days of handshake deals, he knew the product he was buying was undoubtedly a step toward the future. While his two existing tension fabric structures were traditional hoop-shaped buildings with web truss framing, Legacy buildings instead use an innovative solid beam engineering concept where the fabric roof attaches to structural steel I-beams.

"Price is a major factor in any purchase decision," said Shell. "But we didn't blink at having to pay a little more for the Legacy structure. Sometimes you have to spend more to get a higher quality building."

The completed building measures 75ft by 200ft with over 30ft of clearance at the peak. The 15,000ft^2 is enough to contain about 3,000 tonnes (or 140 truckloads) of bulk material. The structure is cladded in white 15-ounce polyethylene fabric with blue trim to match the other fabric buildings at Five Rivers, which had been supplied by Cover-All and ClearSpan.

The structure sits atop a concrete-in-place foundation seven feet above grade, and is engineered withstand a 90mph wind load. It also holds snow loads of 10 pounds per square foot and is designed to meet seismic zone 'C' design codes. A framed and wrapped doorway measures 16ft by 16ft, and all steel members are hot dip galvanized to protect against corrosive elements.

"The installation was very smooth," said Shell. "Legacy's in-house crew worked in cold winter conditions, and they erected the building within five days. They were a very professional group, and I'd highly recommend them."

Shell was equally impressed with the building itself once it became fully operational. The rigid-frame design, in particular, immediately stood out to crew members working inside.

"We like the side columns going straight up instead of curving down like in our hoop buildings," said Shell. "First off, we can put more product in there. And our front end loaders can get much closer to the walls and drive straight down the sides. It gives us more working room and increases our efficiency."

Fiver Rivers also observed better air movement through the building, thanks to ten Schaefer RV-3000 ridge vents and 18-inch overhangs with additional mesh vents. "The ventilation systems on the sides draw air through nicely," said Shell. "And the vents at the top definitely perform better than the sidewall louvres on our older fabric structures. When you're handling bulk products, that really does help. In the long run I think it will be a building that requires less maintenance."

After hearing from customers who were interested in his new storage space, Shell wasted almost no time in making plans to build yet another fabric structure to add even more bulk storage capacity in Van Buren.

"Legacy was so outstanding to work with that I didn't even bother looking at pricing elsewhere," said Shell. "We had a few months to see that the building was exceeding our expectations, so we went straight back to them."

The contract for the next building was nearly identical to the first Legacy building, with all the same construction and accessory features. The only difference was an extra 4,200ft^2. The latest building measures 120ft by 160ft, in order to capture the largest possible footprint permitted by the city and to avoid wasting space in that section of the site, where all four fabric buildings are lined up in close proximity.

"I wanted to put all of these buildings close together, so we have all our bulk products in one area," said Shell. "That way we're not running manpower and equipment across the property to move from one warehouse to the next. We may have to add more fabric storage elsewhere down the road, but for now it's very convenient going door to door."

Five Rivers Distribution has always been about convenience. Its first fabric buildings were doing the trick to a certain extent, but by proactively investing in higher quality storage facilities, Marty Shell is doing more than adding space for bulk material. He is taking some important steps toward building a better future for his company. DCi

Digital Evolution

Software & Automation

"The Conti MultiProtect monitoring system helps to detect splice faults on the conveyor belt or damage such as longitudinal slitting at an early stage during operation and repair the damage in good time. This helps us to avoid extended downtimes," explains ContiTech application engineer Patrick Raffler. (photo: ContiTech)

The Flexowell system can transport goods at inclines of up to 90°. (photo: ContiTech)

Jay Venter

ContiTech presents digital solutions for the conveyor industry

ContiTech offers smart system solutions — far beyond just conveyor belt production
Innovative digital monitoring system reduces downtimes and maintenance costs
Versatile conveyor belt systems for steep and vertical conveying

International technology company ContiTech is expanding its portfolio of industrial applications for the conveyor belt industry. Alongside conveyor belts, the company is working hard on smart systems and expanding its range of services. This allows the industrial partner to offer its customers holistic solutions that go far beyond the conveyor belt product. "We primarily focus on new digital offers that create clear added value for our customers," says Dr. Michael Hofmann, who heads the ContiTech segment Industrial Belting Solutions within the Continental corporation. At the Schüttgut trade fair from 10–11 May in Dortmund, ContiTech presented its many innovations, including belt monitoring.

Preventative protection with monitoring systems

Smooth running of these belts is crucial for the cost efficiency of conveyor belt systems. To allow them to run free of faults for a long time, even when subjected to high loads, the operators are focusing more and more on prevention. Innovative electronic monitoring systems make it possible to identify the exact condition of the conveyor belts at any time. The newly developed monitoring system Conti MultiProtect helps to detect splice faults during operation and damage such as longitudinal slitting in good time. Rip inserts (rip detection inserts) are embedded in the conveyor belt. They produce a characteristic magnetic field that is used for monitoring.

In addition, Conti MultiProtect is based on software developed in-house, into which the long-standing expertise of specialists in conveyor belts has been incorporated. "The new system permits even more accurate monitoring of steel cord conveyor belts," says application engineer Patrick Raffler. "It gives us a detailed picture of the status of the conveyor belts at all times without having to interrupt operations."

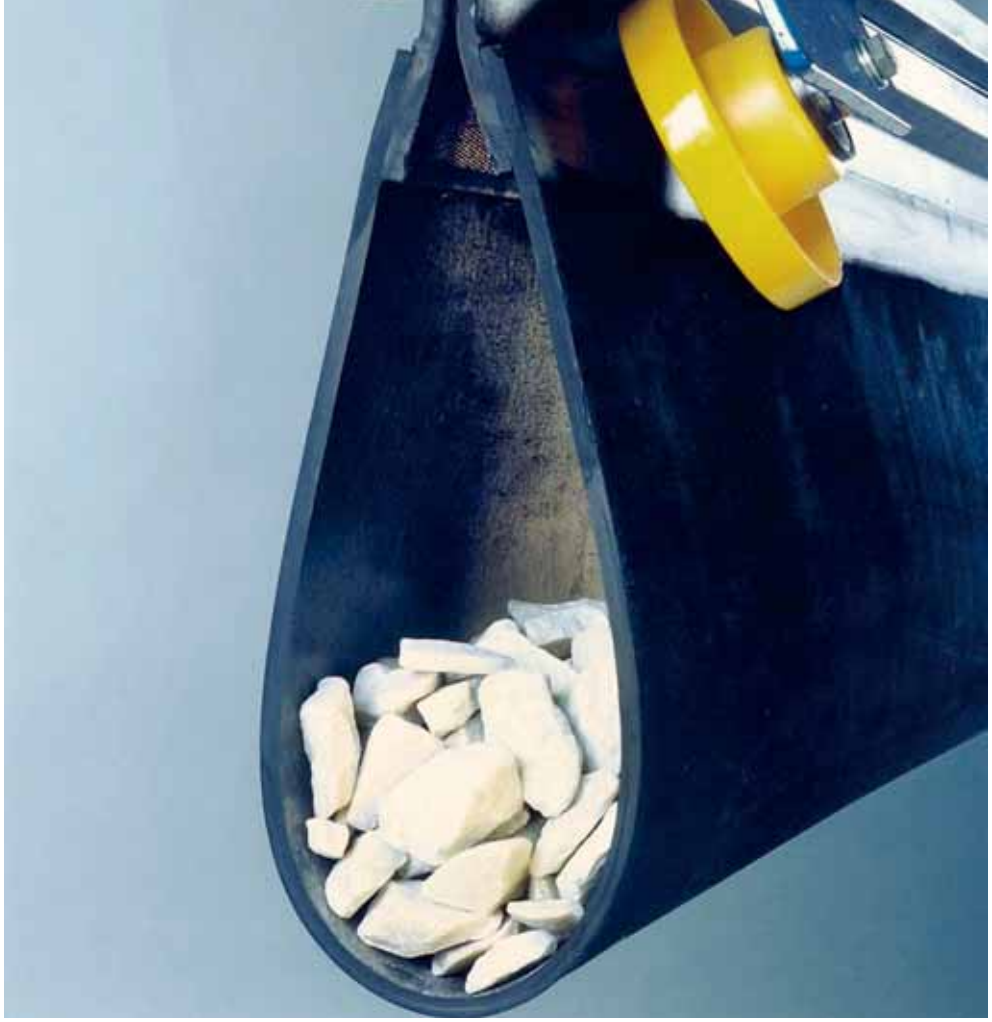
Intelligent solutions for steep angles

Extreme gradients are a challenge for bulk haulage operations. Using special-purpose conveyor belt systems, ContiTech has created solutions that even enable vertical transport. The Flexowell® system can transport goods at inclines of up to 90°. It enables low-noise and environmentally friendly operations with capacities of up to 6,000tph (tonnes per hour). With this system, even multiple shifts from horizontal to vertical are possible with just one conveyor belt. System operators save in the long term as a result of the energy savings and long service lives in particular.

The Sicon ContiTech conveyor belt system is a real all-round talent: with its closed form, it is particularly suited to transporting sensitive goods. It is capable of negotiating small-radius bends easily, thereby rendering transfer stations superfluous. Chevron profiles are also reliable assistants in steep-incline conveying. ContiTech offers a range of different cover qualities for different uses – including flame resistant, chemical and oil-resistant varieties. All covers are characterized by their wear-resistant quality.

Versatile application opportunities

For a variety of light and moderately heavy uses, lightweight ContiTech conveyor belts offer a broad range of opportunities.



They are manufactured specially for the respective application in line with customer requirements. Whether length and width, materials, profile or colour: the lightweight conveyor belt can be perfectly designed from the variety of possibilities.

Thanks to the patented Triple-Warp technology, the lightweight conveyor belts are exceptionally robust and durable. Innovative thermoplastic compounds offer many advantages for use in areas such as the food industry, baggage handling, warehousing and distribution and in conveying small parts. For example, the conveyor belts are easy to clean. It is also possible to equip them with oil, grease and chemical resistant covers, with heat resistant models also available.

With its closed form, the Sicon conveyor belt system by ContiTech is particularly suited to transporting sensitive goods. (photo: ContiTech)

Consolidated Grain and Barge Co. announces paperless signing for customers

Consolidated Grain and Barge Co. (CGB), active in the grain and transportation industries since 1970, is pleased to announce that it will begin offering paperless signing service for its customers, *writes Kelly Buchanan*.

This service, made possible by CGB and E-Sign Live, went live in March and is available free of charge.

"We continually strive to not only meet, but to exceed customer expectations and remain on the forefront of technological advances to pass along to our producers. We expect this service will be huge asset to our customer base and is a much-needed response to the vast inefficiencies of dealing with physical signatures," said Kelly Buchanan, Marketing and Communications Manager, Grain Division.

In order to sign up for this free s-signature service, customers must have an active CGBonLine account. As contracts are agreed upon, contract confirmations will be sent for signature through email for digital signing.

Customers can access and sign from literally anywhere they have internet access, straight from their desktop, tablet, or smartphone. These contracts can also be saved and printed, giving the customer flexibility in how he/she prefers to manage paperwork.

About CGB Enterprises, Inc.

CGB Enterprises, Inc., headquartered in Mandeville, LA, USA, operates 97 grain facilities across the Midwest. In addition to grain facilities, the company has dedicated operations in logistics and transportation, fertilizer, crop insurance, agri-finance, soybean processing, producer risk management, and other related businesses.

DBIS changes name to TBA Doncaster

DBIS, which provides the CommTrac Terminal Operating System to bulk and general cargo terminals around the world, is to change its name to TBA Doncaster.

For a number of years, DBIS has been a sister company of both CS&A Ltd — based in Leicester UK — and TBA BV — based in Delft, the Netherlands. During that time, the organizations have begun to work more closely together in providing design, software and automation systems to its clients and having three different names has made this difficult to explain to its customers.

It therefore has decided that a single brand would be easier for the market to understand and is moving through the process of changing its name to TBA Doncaster Ltd. CS&A Ltd will become TBA Leicester Ltd.

The company's organizational structure, shareholding and capability shall remain as before, but it is looking forward to aligning to provide more integrated services and products to its customers.

ABB launches digital solutions offering, ABB Ability™

ABB commercially launched ABB Ability, its industry-leading portfolio of digital solutions, at ABB Customer World in Houston.

With the commercial launch of more than 180 solutions and services today, ABB is unlocking value for customers in the Fourth Industrial Revolution. By combining ABB's deep domain expertise with network connectivity and the latest digital technologies and innovations, ABB Ability creates powerful solutions and services that solve real business problems and produce tangible business opportunities.

ABB Ability helps customers in utilities, industry, transport and infrastructure develop new processes and advance existing ones by providing insights and optimizing planning and controls for real-time operations. The results can then be fed into control systems to improve key metrics such as factory uptime, speed and yield.

The offering builds on ABB's pioneering technology and more than four decades of industrial digital leadership. It will enhance customers' ability to innovate and compete in the emerging digital-industrial marketplace.

"With an installed base of more than 70 million connected devices and 70,000 control systems, ABB is uniquely positioned to support its customers' digital transformation," said ABB CEO Ulrich Spiesshofer. "With ABB Ability, we are combining ABB's entire portfolio of digital solutions and services. We are creating additional customer value by bringing together ABB's domain expertise, advanced connectivity and the latest digital technologies. With this, our customers can achieve unprecedented improvements in operational performance and productivity."

Digital offerings provided by ABB Ability include performance management solutions for asset-intensive industries; control systems for process industries; remote monitoring services for robots, motors and machinery; and control solutions for buildings, electric-vehicle charging networks and offshore platforms. Some of the more specialized offerings address energy management for data centers and navigation optimization for maritime shipping fleets, among many others.

Customers who are already using the portfolio of digital solutions that are now part of ABB Ability include some of the world's leading utilities, manufacturers and service providers, among them Shell Oil, CenterPoint Energy, Con Edison, BASF, Royal Caribbean, Cargill, Volvo, BMW and many others.

ABB Ability's next-generation digital solutions and services are being developed and built on Microsoft's leading Azure cloud platform, based on a strategic partnership with the software company.

"Building our solutions on the Azure platform means we can take advantage of all of its capabilities and add value with our domain-specific offering," said ABB Chief Digital Officer Guido Jouret. "In effect, we are turning ABB's decades of industrial domain expertise into software offerings that our customers can access through the world's largest and most advanced digital platform. From being a hidden digital champion, we are becoming the partner of choice for customers embarking on a digital transformation. They can now know more, do more, do better, together. We can help them assess, automate, optimize and collaborate."

Among the new ABB Ability innovations showcased in Houston are:

ABB Ability System 800xA — one of the solutions provided by ABB Ability builds on the market-leading automation platform System 800xA. Select I/O, a new addition to System 800xA, is a redundant, Ethernet-based, single-channel I/O system. It supports ABB's next-generation project execution model, Intelligent Projects, which offers a range of efficiency improvements for automation projects. With Select I/O, customers can undertake major projects on a faster schedule with fewer cost overruns. It uses standardized cabinets that allow installers to digitally marshal signals instead of using labour-intensive marshalling panels.

ABB Ability Asset Health Center — among the first ABB Ability solutions to be launched on Azure is ABB's next-generation asset performance management solution, Asset Health Center 3.0. Available since January 2017, it uses predictive and prescriptive analytics and customized models to identify and prioritize emerging maintenance needs based on probability of failure and asset criticality.

ABB Ability Collaborative Operations — this powerful solution, now being brought to scale across industries, helps customers collaborate more effectively. It allows experts to work together across organization boundaries, using the same data and analytics platforms. It focuses on such outcomes as improving productivity, reducing equipment failures, lowering the cost of asset maintenance and transforming overall business performance. This is done while maximizing security and protecting data, people and assets at every level of integration.

ABB Ability Digital Substation — ABB's digital substation provides customers in the utility sector with unmatched control and efficiency. The digital substation incorporates fibre-optic current sensors and disconnecting circuit breakers to reduce maintenance requirements and the need for miles of conventional cabling. ABB Ability takes these advances several steps further by combining the latest electrical gear with digital sensors and cloud computing. The result is that grid operators can make decisions based on comprehensive, up-to-the-moment information, while predictive algorithms can improve maintenance practices and asset management.

ABB Ability Smart Sensor — this smart sensor solution, unveiled last year, connects low-voltage electric motors to the Industrial Internet, allowing them to be monitored continuously. The solution, which can be easily affixed to a motor, transmits data on vibration, temperature, loads and power consumption to the cloud. Alerts are generated as soon as any of the parameters deviates from the norm, allowing the operator to take preventive action before the motor malfunctions. Early indications are that the smart sensor solution leads to a reduction in downtime of motors by up to 70% and extends their lifespan by up to 30%. Acting on the data to optimize the motor's performance reduces energy consumption by as much as 10%.

The list of innovative and versatile solutions associated with ABB Ability continues, with such offerings as ABB Ability Asset Insight, ABB Ability Ellipse Enterprise Asset Management software, and the ABB Ability Data Center Automation infrastructure management software. With solutions like these and many more, ABB Ability will serve customers in utilities, industry, and transport and infrastructure. It will leverage the power of the digital revolution by enabling reduced maintenance costs, longer asset life, more efficient operations, reduced environmental impacts and improved worker safety. DCi

Hard and fast rules for cement handling

The lower silo cannons strategically placed around the 60º incline.

Louise Dodds-Ely

Resolving material accumulation in cement plant limestone silo

Seasonal weather is somewhat predictable based upon historical data, but forecasting moisture levels from year to year is tricky, *writes Chris Schmelzer, Director of Wear Components Business Group, Martin Engineering*. In parts of the US, weather systems like *El Niño* or *La Niña* can radically change forecasting models. Experienced cement plant operators often keep an eye out for these patterns, because they know that excessive moisture can significantly affect the flow of bulk materials through the different phases of cement production, with limestone being particularly sticky. When crushed to the size needed for cement meal, damp limestone can adhere to belts, chute surfaces and silo walls, accumulating until it eventually creates clogs and forces unscheduled downtime.

The Drake Cement facility ten miles north of Paulden, AZ, experienced the issue firsthand during the winter of 2015 and 2016. In this historically dry state, moisture had only been an issue during snowy winters and monsoon weather in July and August, which sometimes delivered sudden torrential rains. But the long drought in the region gave way to drastically wetter *El Niño* conditions, affecting how raw cargo normally flowed through Drake's material handling system. Operators found that the problem was acute in the silo storing limestone for the raw mill.

"This plant is one of the most state-of-the-art operations of its kind, with advanced operating and pollution controls found in only a few other facilities in the world," explained Jose Venegas, Maintenance Manager at Drake Cement. "Our cement plant has a rated capacity of 660,000 tons (598,741 metric tonnes) of high-quality Portland cement per year."

Dry process

The limestone is crushed to a size of 2-inch (50mm) minus, with the smallest particles about 1/16th of an inch (1.5mm) in diameter, and run through a conveying process to the limestone stockpile. During normal production, 60tph (54.4 metric tph) of low limestone is added to the raw grinding mill.

Along with the calcined limestone mixture, uncalcined gypsum is also added at the end of the process to create Drake's Type II/V (LA) Portland cement. The plant makes products that conform to the physical and chemical requirements of ASTM C-150 for Types II/V, low alkali cement.

Drastic measures

A key component of Drake's dry-process manufacturing is efficient material flow. Excessive rain in the months of January through March caused the limestone being extracted from the nearby quarry to have elevated moisture levels. Not only does the rain cause standing water, but the limestone is also wetter coming out of the ground.

Little of that water is lost in the crushing process, and dry material can absorb moisture as it is reduced in size. So in the winter months, by the time the material lands in the 536-ton (486 metric tonne) low limestone silo, it is nearly saturated. Prior to the winter of 2015, the silo had not experienced a single flow disruption, nor had it required cleaning due to the aid of two Martin® XHV air cannons. Positioned perpendicular to

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the material flow, the units delivered a strong shot of compressed air across the vessel to dislodge stuck material. Adequate in previous years to keep material flowing at required volumes through all seasons, the air cannons were unable to prevent clogging at such high moisture levels.

The new weather situation caused the silo to clog every week. Fed by a 42-inch (1,066mm) conveyor moving material at 400fpm (feet per minute — 2mps [metres per second]), the limestone stuck to the lower slope of the hopper. Highly compacted material quickly moved up the inner shell of the circular 50.7ft (15.4m) tall, 18ft (5.4m) wide silo, forming 8ft (2.4m) thick walls around the mouth and allowing only a narrow rathole that eventually clogged at the silo's 2ft (0.6m) wide shaft leading to the weigh feeder. This required workers to spend up to 12 hours to clean it out using compressed air and other tools. As the winter got worse, so did the clogging problem, and soon the large structure would only take two hours to fill. To remedy this, operators used CO_2 blasting tubes every 15 to 30 minutes.

Contractors installing the pipe nozzles at a 30º angle to promote material flow.

Martin® XHV air cannons in their original perpendicular firing configuration.

Limestone snowballs

"I had a Martin representative coming out to look at another part of the plant, but when the silo clogged, that took immediate priority," said Venegas. "The problem had become disruptive, expensive and hazardous. We needed it solved once and for all."

When Martin Engineering National Business Development Manager Doug Brown arrived at the plant, he found a silo so compactly clogged that it had halted the entire production process. "Inspecting the silo for a solution, we realized that the limestone could be packed like snowballs, dense enough to stick to the wall when thrown," said Brown. "This demonstrated just how serious the problem was. We luckily had a silo cleaning crew that had just finished a job in Tucson, AZ, so they were quickly dispatched north to the plant."

The experienced two-man crew immediately set up a Martin® Heavy Duty Whip. Powered by compressed air, the device can be equipped with a variety of flails and cutting edges to knock down accumulated material without damaging the silo's walls or support structure. Requiring no confined space entry, the device was set above the manhole opening at the top of the vessel and manoeuvred by remote control.

The coiled modular boom extends up to 28ft (8.5m) and can clean vessels as wide as 60ft (18m) in diameter and 225ft (68.5m) tall. Operating from the bottom of the silo up, the pneumatic cutting head delivered a powerful whip action, allowing the team to completely clean out the densely clogged silo in only 11 hours while the plant resumed production.

"Working together with the electrical and maintenance departments, we were able to continue operations during the cleaning process," Venegas said. "This really helped us avoid what could have been some costly downtime."

Long-term prevention

Once the silo had been completely evacuated, Brown — a flow aid specialist — realized that the ongoing problem could be remedied by utilizing Drake's current stockpile of air cannons. Using an innovative placement strategy, Brown was certain that the cannons could safely prevent build-up and promote efficient

The Martin® Heavy Duty Whip is set up above the access at the top of the silo and controlled remotely.

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high-volume material flow, no matter how moist or dense the limestone.

Rather than the two cannons at the bottom of the limestone silo firing across the cargo flow, five cannons were strategically placed around the vessel. Installed with a wide 4in (101mm) valve, three 70-litre (88 lb/40kg) Martin® Tornado Air Cannons were placed on the lower incline of the cone at a 30° downward angle against the 60° slope in the 6 and 12 o'clock positions (one side of the silo was inaccessible). In the 3 o'clock position, one air cannon was situated at the 2ft-wide shaft, and another was added to the upper silo to aid in loosening material.

Fitted with standard pipe nozzles, the cannons deliver a strong pressurized blast of air down the wall of the silo, which dislodges adhered material and introduces it back into the process flow. The nozzle assembly allows Drake to utilize its current supply of Martin XHV and Tornado cannons, and then upgrade to newer technology at a later date.

"This type of air cannon configuration has shown to be highly effective in promoting flow and preventing clogging," Brown pointed out. "It has the benefit of directing the air cannon's blast to dislodge the material, delivering a more powerful shot on accumulation that's stuck to the vessel wall."

Already fitted with 53 XHV and Tornado Air Cannons throughout the plant, a programmable logic control (PLC) system centrally placed in the facility coordinates and monitors the timing and firing sequence of each unit at all locations, including the limestone silo. This made expanding the system easier, since the cannons use a positive-acting valve that is triggered by a solenoid panel set a safe and convenient distance — up to 200ft (61m) — from the cannons. Connected to the plant's compressed air system, the improved air path of the Tornado fills the reservoir three to four times faster than typical designs. The positive-acting valve opens in response to a surge of air sent by the solenoid, amplifying the discharge force by 20% and reducing the chance of misfires.

During the wet winter and monsoon months, the cannons were activated approximately every hour, but throughout the rest of the year the system has a firing sequence of only four to five times per day. "We also added a layer of protection that the silo didn't have before by installing an automated weight sensor," Venegas explained. "If the silo exceeds 40 tonnes of downward pressure, logistical software detects the buildup and fires the cannons. This sequence can also be manually activated from the weigh feeder, at the solenoid panel or in the control room."

Results demonstrated by production gains

A two-man team did the air cannon installation over a two-day period, coinciding with other maintenance. Since installation, plant production has returned to normal levels. Material flow is ongoing, and the silo has not been shut down for cleaning.

There has been no unscheduled downtime due to clogging, which has greatly increased production, especially through heavy weather periods. The use of CO_2 tubes has been ceased altogether. When a build-up is detected, workers no longer are required to get close to the area to resolve it, increasing plant safety and reducing the number of man hours required to maintain the silo.

"This equipment upgrade has paid for itself many times over," Venegas said. "We are extremely happy with the results. The service was fast, responsive and well coordinated. During our next scheduled outage, we're going to have a Martin Engineering team out here to consult on other areas where we might need air cannons, so that we can maximize production. We look forward to an ongoing and productive relationship."

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Cement loading with Cleveland Cascades dust controlled loading chutes

Based in the UK, Cleveland Cascades company employs a team of experts in design, manufacture, assembly and commissioning of bespoke loading chutes for the handling of dry bulk materials, including cement.

Cleveland loading chutes are particularly well suited to handling cement, and the sector has always been a major part of the company's business. In 2016, it accounted for approximately 22% of sales and the systems were delivered worldwide to customers in North and South America, Asia, Australia as well as in Europe. The product types delivered last year in to the cement sector also varied widely, including cascade ship loaders, transfer chutes and free-fall vehicle loading chutes. Some of the company's clients include Tiam and Irish Cement, Bedeschi, Cemex, SMB and FL Smidth.

Notable cement projects include:

- **Titan Cement UK, based in Hull, UK:** Titan Cement invited Cleveland Cascades to commission two tanker loader systems purchased for King George Dock. The chutes load cement into tanker trucks with closed hatches at rates of up to 150tph (tonnes per hour). The cement is imported from around Europe on vessels, and is air-blown into Titan Cement's storage silo for truck-loading thereafter. The Cascade tanker units utilize a rubber seal at the outlet in order to create a perfect seal between the chute and the tanker hatch for much improved dust-free loading. The air displacement is controlled by an internal extraction system that works across both chutes and any product extracted is taken back into the silo for re-loading.
- **CRH US:** Cleveland Cascades recently gained an order in partnership with CRH US to supply 3 Cascade vehicle loading chutes to the Montana region.

  CRH US's brief was that it required three Cascade vehicle loading chutes, and above all, it was also important that loading had to be as dust free as possible hence the choice of Cleveland's incomparable Cascade chute.

  The supplied chutes are 4.75m long, been interfaced with the conveyor in order to effectively handle clinker, cement, at rates up to 390 metric tonnes per hour. The cones have been lined with ceramic to handle the abrasiveness of the material, along with a special adhesive to deal with the varying temperatures of the product. Electric slide valves have also been requested to assist in the control of the material.

  The unique Cascade chute arrangement, means that the cement, clinker which in itself is an extremely dusty but abrasive material could then be loaded in mass flow; this is the transfer of bulk material as a single mass moving at a low speed, but high volume. The Cascade chute has been proven to be the most effective loading chute for protecting against both dust emissions generation, and degradation of material particles. These two issues were at the forefront of thinking on this project, and resulted in the Cascade chute from Cleveland being chosen.

Cleveland Cascade origins

The Cleveland Cascade chute originated from an in-house project developed at a bulk handling facility on Teesside in the early 1990s. The facility had faced pressure from port operators and surrounding businesses relating to the safe and efficient loading of potash. The success of the system resulted in the idea being patented and sold worldwide, handling a vast variety of dry bulk materials, from large lump iron ore and, coke and coal, granular products including grains, through to fine powders such as cement, soda ash, phosphate and alumina.

The Cleveland system allows a controlled, yet efficient transfer of materials from conveyor to ship, silo or stockpile. The material is loaded at a low velocity, yet high volume and this means products can be transferred with minimized generation of dust emissions, and also minimized degradation and stockpile segregation of product. Such is the low

environmental impact of the Cascade chute, Cleveland is the only loading manufacturer in the world that offers a guarantee that less than 5mg per cubic metre of air is produced from the Cascade chute, something that is very important for the operators in the transfer of material like coal.

The unique Cascade chute achieves its performance by using a series of oppositely inclined cones, optimally sized and arranged at a specific spacing and inclination. When the correct Cascade arrangement is loaded with a specified tonnage feed of bulk material, the cone arrangement becomes back-filled or semi-choked to amass a body of material inside of each cone supported on its running surfaces. The material then slides on itself, reducing impact wear within the cones and liners to a minimum. The result is called 'mass flow' — a large volume of material loaded at a very low velocity, and the results from loading materials in mass flow are minimization of dust emissions, product degradation and stockpile segregation to the greatest possible extent.

The results of the Cascade chute have proven to be so good, the chutes do not require any dust extraction or suppression systems. This results in the overall loading systems having lower capital equipment costs, and lower maintenance costs over the working life of the operation.

Conventional chutes

Where stringent dust controls are not required by the operator, Cleveland offers design and manufacture of a more cost-effective conventional telescopic chutes, together with a range of smaller chutes for truck, tanker and rail loading operations. These chutes are robustly constructed, and well-engineered to withstand the day to day use in their respective environments. Materials of construction are bespoke to the application and special requirements are catered for. The design is such that these products will give many years of trouble-free service.

In addition, the company has also developed and supplied Cascade transfer chutes to solve the dust emissions problem created at conveyor transfer points. This represents a logical step for the business, as for years it has provided the means for materials loading from the conveyor to receptor, ship, rail wagon or tanker etc. And so now it is providing materials loading in the same controlled manner between two conveyor belts.

With over 665 systems operating worldwide with applications in ship, silo, road, rail and tanker loading, the company's key to success is its proven ability to provide a well-engineered solution with professional spares, commissioning services and committed support.

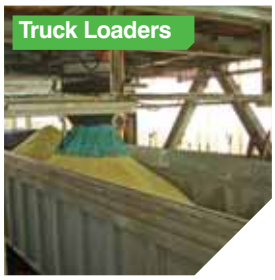
Moving forward, the challenge for Cleveland is no longer to prove the systems abilities with loading cement to achieve these desired results, but grow the system in size to accommodate larger handling rates. Cleveland has now extended its size range to accommodate loading rates from 50 cubic meters per hour up to 7,000 cubic meters per hour of all dry and free-flowing bulk materials, and bespoke chutes of 45 metres plus are now being requested.

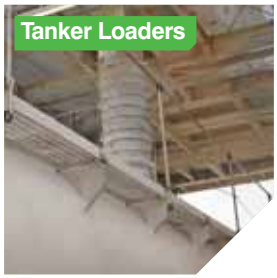
Having achieved Awards for Environmental Engineering, and the Queens Award for Environmental Achievement and Export Achievement, there is no doubt that Cleveland is proficient in bulk loading solutions, using its unique cascade system.

Cleveland Cascades Ltd continues to remains at the forefront of innovative design within the bulk industry, taking its technology and experience, and tailoring it to meet the demands of individual customer needs.

Cleveland Cascades Ltd

Global leader in bespoke dry bulk loading chutes





Cleveland Cascades are Specialists in the design and manufacture of bespoke dry bulk loading chutes.

Our bespoke solutions are designed to meet each customer's specific requirements from a tool kit of proven components, utilising the expertise of a team of specialist in house design engineers.

We lead the loading chute industry & set the standard for dust emissions and environmental pollution control in dry bulk handling.

Our worldwide reputation is built on high quality, well-engineered, robust, high performance chutes, backed up by excellent customer service and global lifetime product support.

Contact Cleveland Cascades Ltd

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Cementos Bio Bio's storage structures: in service for 20 years

Owner: Cementos Bio Bio SA
Location: Curicó, Chile
Project highlights:

- 120m longitudinal dome for limestone storage
- 175m longitudinal dome for pozzolana storage
- 54m space frame for palletized cement storage

Overview

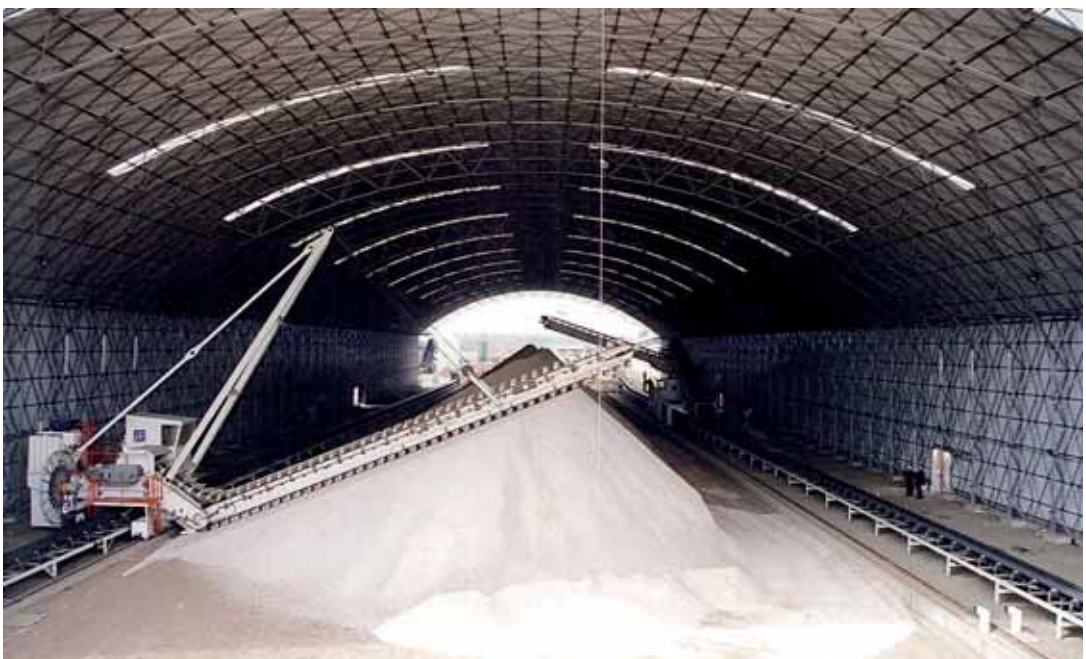
Founded in 1957, Cementos Bio Bio SA is one of Chile's largest companies involved in the production, distribution and sale of cement, lime, concrete, mortar and aggregates. Located approximately 215km south of Santiago, the Curicó plant was built alongside the Pan-American highway and designed to produce 1mtpa (million tonnes per annum) of cement.

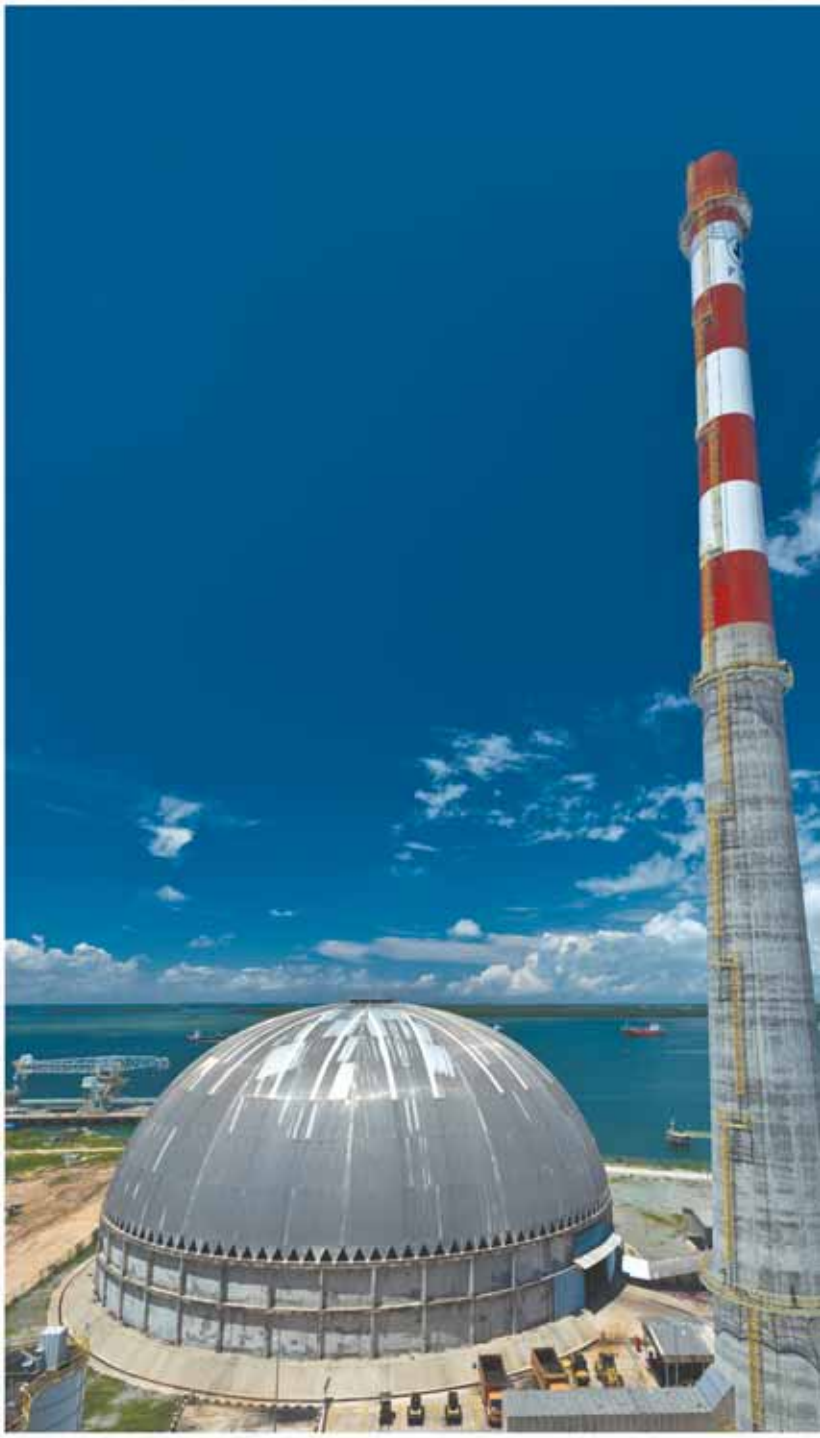
When built in 1996, the plant was required to comply with strict environmental regulations, which mandated covering areas used to store and pre-blend materials, such as limestone and pozzolana, used in the cement production process.

Design selection

Cementos Bio Bio contracted with a local engineering firm for the development of a conceptual storage solution. Because of the long spans required for the storage areas, it was concluded that the greatest cost efficiency would be gained with a lightweight structural system. This recommendation encompassed three storage structures for limestone, pozzolana, and cement bags to cover a total area of 17,000m^2 .

Based upon the conceptual recommendation, Cementos Bio Bio prepared technical specifications for the storage structures'





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GEOMETRICA'S STRUCTURES

	Limestone — longitudinal	Pozzolana — longitudinal	Palletized storage - space frame
Plan dimensions (m)	52 x 120	50 x 175	38 x 54
Height (m)	20	20	13
Material	galvanized steel	galvanized steel	galvanized steel
Openings	3 vehicle, 2 personnel	6 vehicle, 4 personnel	—
Structural bars (qty)	30,250	43,442	9,095
Hubs (qty)	10,000	14,423	2,422
Covered area (m^2)	6,498	8,978	2,052
Cladding area (m^2)	10,209	14,627	2,100

tender. Technical specifications included the geometric parameters to allow for the operability of the longitudinal stacking, blending and reclaiming processes. Two alternatives were considered: local design and fabrication — or, purchasing from a global supplier.

Ultimately, Geometrica won the contract. Cementos Bio Bio and Geometrica jointly completed the design requirements for the structures. Based upon these requirements, Geometrica designed the foundations and storage structures.

GEOMETRICA'S STRUCTURES

Geometrica supplied three bulk storage structures for limestone, pozzolana and palletized bags of cement.

The two bulk material storage enclosures consist of longitudinal structures constructed from circular arches supported on vertical walls. Both structures consist of triangular reinforced ribs spaced at 4.2m intervals with a reticular membrane infill. The ends of both structures are formed by attractive arched framed walls. Several openings are provided longitudinally for belt conveyors to go into and out of the stockpiles.

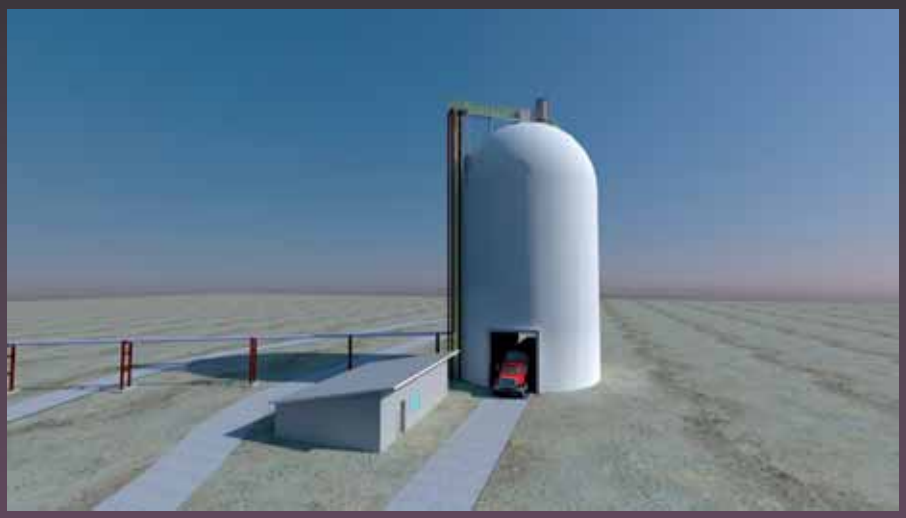
The third enclosure for palletized storage, consists of a reticulated roof structure with a 12% slope. The roof structure is supported on perimeter steel columns spaced at approximately 9m intervals.

All structures are made of galvanized steel tubular bars joined by high-strength cylindrical aluminium connectors. Cladding is made of galvanized and painted corrugated steel panels; translucent acrylic panels in a matching profile are used to allow natural light into the buildings.

Not only lightweight, galvanized steel also provides corrosion resistance for years of worry-free storage with minimal maintenance.

The domes were pre-fabricated in Geometrica's plant located in Monterrey, Mexico with a quality- and computer-controlled process (ISO 9001:2008 certification, EN 1090, and BS OHSAS

Dome Technology develops cost-competitive direct-load-out system for cement and fly ash



Dome Technology has developed its Drive-Thru DomeSilo™ for cement and fly-ash storage, allowing companies to fill truck or rail directly from the storage structure and speeding up the process of product reception to delivery, *writes Rebecca Long Pyper for Dome Technology*.

The Drive-Thru DomeSilo incorporates a fill pipe, storage vessel, ladder access, truck scale and appropriate foundation. Dome Technology sales manager Lane Roberts said, "Cement companies can save on building a single drive-through storage facility by eliminating the need for multiple mechanical systems, two operators and multiple structures," Roberts said, noting that the DomeSilo is less expensive to build than a silo of similar capacity.

The new model 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.

According to Weber, the drive-through model could be used for applications like grain in the future, but the extremely active cement market took priority because demand for terminal storage is high. "Cement receiving, whether from a barge, shipping vessel or train, can be unloaded into the dome and then directly loaded into trucks or rail cars. This system directly competes with bolted steel tanks and drive-through concrete silos. Due to the unique construction techniques, this storage vessel is quickly constructed and very competitive," Weber said.

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-through silo — it can store so much more than a typical steel day bin," 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."

Perhaps one point of interest is the range of benefits available with this model. According to Weber, the direct load-out system is cost competitive and reduces power consumption and overall maintenance as compared to a separate storage and load-out bin. Dome Technology has been building bulk-storage domes for more than 40 years, but "due to innovations in our construction process, it has now become possible to be competitive in the smaller-storage market," Bateman said, adding that improvements in construction equipment have also increased the company's ability to compete with storage of this scale. "With advances in technology and through our relationship with equipment manufacturers, we now have construction equipment that can be used to efficiently build this type of structure," he said.

According to Roberts, the Drive-Thru DomeSilo will compete with steel bins and surpass the protection they offer. Constructed of reinforced concrete, the dome's thermal mass will minimize condensation common with steel structures, so the product will develop fewer lumps. Also, steel bins sweat as temperatures change day to night. The DomeSilo will mitigate this concern based on mode of construction. A PVC membrane surrounding the entire dome prevents water and moisture from seeping in, blocking the introduction of outside water into the product. The dome's insulated nature reduces heating and cooling of the walls and air inside, preventing condensation from forming on the interior. The concrete provides humidity control and moderate externally generated temperature fluctuations. A dome provides ideal conditions for stored materials requiring a controlled environment, Roberts said.

The centrepiece of the drive-through model is the reinforced concrete DomeSilo based on the same innovations as other Dome Technology bulk-storage domes. This model has proven strong enough to weather extreme wind and seismic events and even projectile penetration. Based on its geometry, the dome can also support large loads at the apex, such as those present with headhouses and conveyor systems. The dome's geometry also allows the structure to be completely filled to maximize its storage capacity — something steel bins cannot do.

The Drive-Thru DomeSilo uses proven technology combined with new construction equipment providing an improved option for load-out systems. "We are using proven technology — combining them in a way that hasn't been done in the past," Bateman said.

18001 certification). Every single component was custom-made, marked, and then sorted into substructures in the exact order that the structures needed to get built. The modules were packaged into crates, then containerized and shipped to site.

Construction

Construction was carried out entirely with locally-sourced labour and supported with a site consultant from Geometrica. No welding was required since all of the structure's connections were joined with Geometrica's efficient, mechanical hubs.

For the limestone and pozzolana enclosures, the foundations consist of pad footings connected by longitudinal concrete grade beams. Each arch was assembled on the ground in two sections, lifted by cranes and joined at the apex. The reticular infill membrane was assembled in the air between arches. After erecting the complete structure, the galvanized steel and acrylic cladding panels were installed.

The foundation for the cement bag storage building used a similar systems of pad footings joined by grade beams The three-dimensional structure was fully assembled on the ground and lifted vertically into position.

Results

Cementos Bio Bio has continued to grow and improve its position in the cement sector throughout Chile. Following an expansion of the Curicó plant in 2008, the installed capacity is approximately 1,700,000mtpa of cement.

It seems like only yesterday when we installed these storage structures in Chile. And now, 20 years later, the bulk storage structures still contain the dust from stacking and blending of raw materials, helping meet the plant's environmental goals.

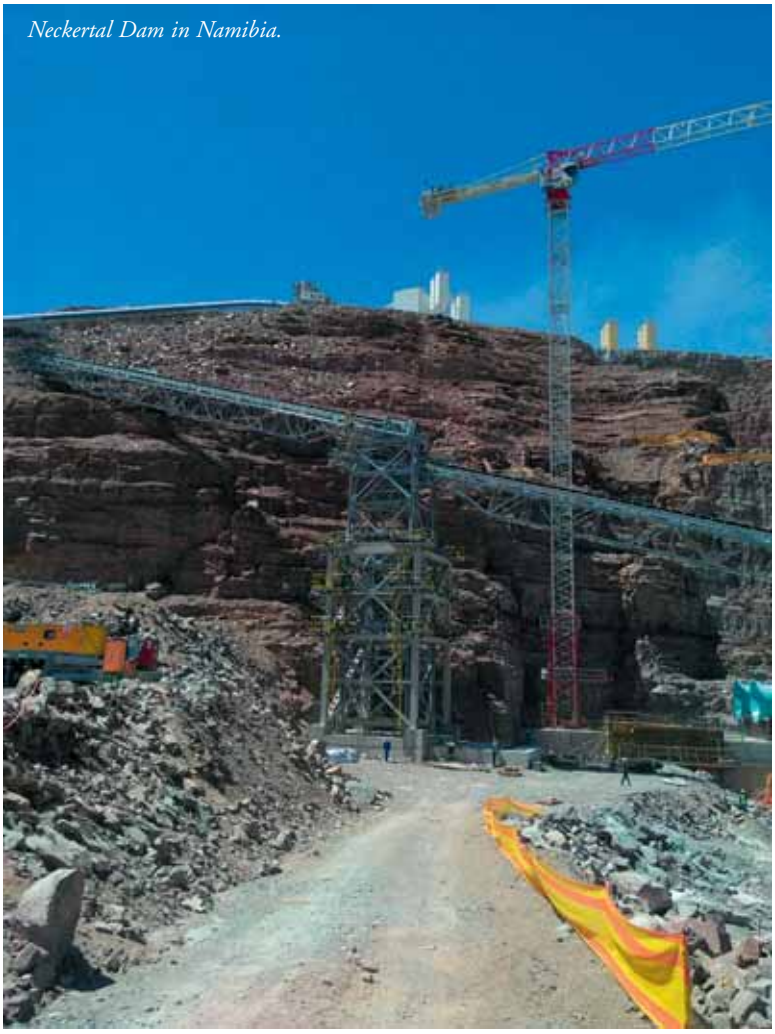
The environment, is also protected by Geometrica's structures. This three-structure project exemplifies the ability to promote environmental responsibility in an industrial setting.

Geometrica stands apart as one of the few companies with the breadth of experience and expertise to deliver such lightweight, durable — and equally beautiful — storage solutions.

STM: Italian expertise to support RCC concrete placing operations

Italian company STM specializes in the engineering and supply of belt conveyor systems for bulk materials handling facilities. STM offers its customers a full range of project services: engineering, fabrication and commissioning. At every step, it develops flexible, individual and effective solutions. Therefore, STM is able to create equipment of any size and complexity, which fully meets its customers' needs.

The whole supply process, from feasibility studies to final delivery and commissioning, is completely implemented in STM's factory, which is located at the company's headquarters in Tito Scalo (Potenza), in Italy. This makes it possible for STM to optimize the design, the industrialization time and the information exchange with the customer.



Neckertal Dam in Namibia.

STM: long experience in RCC dams

STM has wide experience in the dam market, and has fine-tuned its expertise during many projects worldwide (Namibia, Canada, Malaysia, Ethiopia, Morocco, Turkey, Sudan), enabling it to develop even more innovative solutions for bulk material handling in order to meet the needs of all its customers.

In particular, in the RCC (roller compacted concrete) dam field, STM has developed the whole material handling process — for moving the aggregates to the cooling and batching plant, and for the RCC concrete from the batching plant to the dam site.

STM works in strong partnership with the customer to develop the best solution for crushing plants, to provide an efficient and effective system to handle the material flows. The system engineered from STM in some plants for handling aggregates allows for only one overland conveyor for all the different lump sizes. A PLC system automatically manages the flow of different materials, with an easy and flexible logic.

RCC concrete placing solutions

STM developed a specific system for the concrete placement, both for conventional concrete and for RCC.

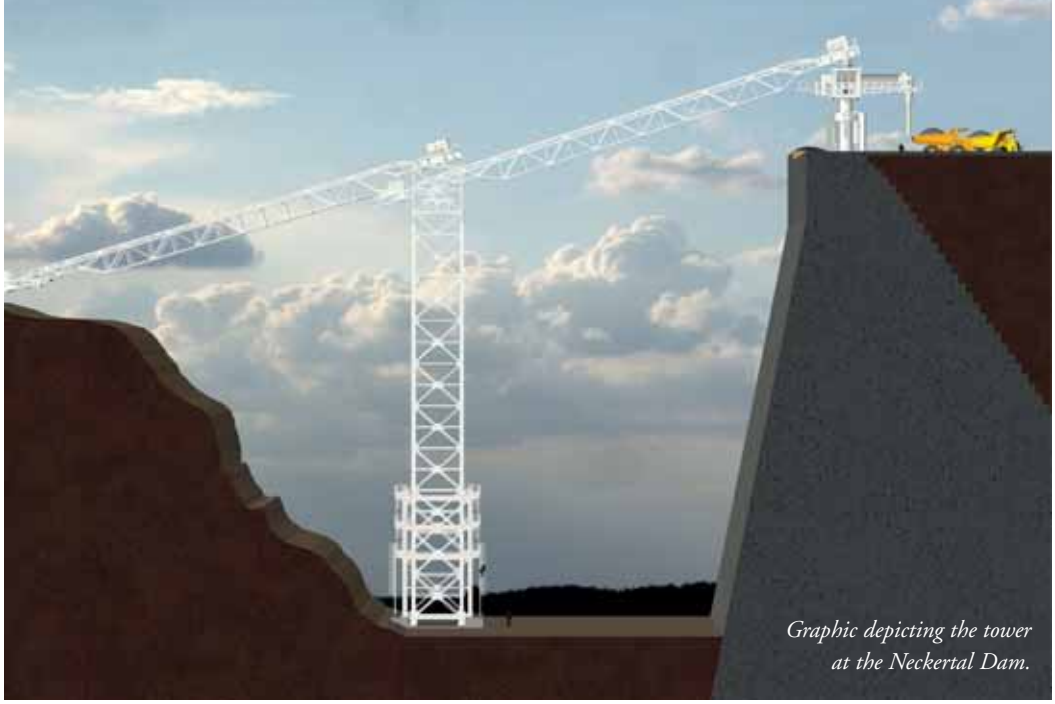
RCC concrete is mainly employed for gravity dams. Contractors are increasingly looking for equipment able to guarantee them continuous feeding with flexible use mode. This will enable them to reduce the entire duration of the construction site; and to meet operational, financial, environmental requirements and to deliver such important infrastructure to the local community as soon as possible. These features are provided by a conveyor line able to follow the dam as it grows, with special devices such as elevation tools for conveyors and distribution devices like swingers, crawler placers, tripper conveyors.

The new swinger conveyor, specially developed by STM, for the Neckertal Dam in Namibia.

Namibia – Neckartal Dam

At the moment, STM is working to install the belt conveyor package at Neckartal Dam, in the Karas region of Namibia. The Neckartal dam will be made from RCC concrete and will stand around 80 metres high. The volume of the RCC dam is 750,000m^3 with 450m of STM conveyors installed.

On this occasion, STM is providing a cutting-edge and complex plant that is able



Graphic depicting the tower at the Neckertal Dam.

to lift to follow the growth of the dam wall.

Of particular note, STM developed the new swinger conveyor — a special conveyor with main features of rotating (even up to 360°) and self-elevation — to meet the needs of the contractors, who want equipment that can ensure uninterrupted feeding.

Undoubtedly, the swinger is an effective solution to follow the elevation of the dam, but it is necessary to modify the height of the conveyor which feeds the swinger as well. To reach this goal the conveyor, with another upper conveyor which discharges the material in it, is located on a self-lifting 60-metre tower which is provided with a lifting system.

The tower is composed of an internal tower supported by an external one during the lifting phase. In the internal tower, there is a one-metre base to which additional modules are added and a last fixed module. This module is the place where the two conveyors are located: the upper one discharges the RCC in a lower conveyor which reaches the swinger.

Hydraulic cylinders are used to lift the external tower that has to sustain the fixed module; when this is raised it is possible to insert the additional modules. Each module is six metres high. This innovative lifting solution allows the belt conveyors to have a 3° inclination range, indeed it can have a minimum inclination of –20° and reach a maximum inclination of +20°.

Customers greatly appreciate this solution, because it satisfies one of the more compelling needs of contractors who use concrete as a construction material.

Malaysia – Susu Dam (Ulu Jelai Hydroelectric Project)

Another valuable example in this field is the Ulu Jelai Dam in Malaysia. STM was awarded a contract to supply the belt conveyor system. The project is located approximately 200km north of Kuala Lumpur in the state of Pahang. The main component is the construction of the dam on the Bertram River, more than 80 metres high and constructed entirely using the advanced technology of RCC. The volume of RCC dam is 750,000m^3 and has a total length of 850 metres of STM conveyor installed.

The RCC conveyor line is mainly composed of a stationary hopper, a special feed conveyor and five bridge conveyors, as well as the swinger conveyor. The stationary hopper is a useful piece of equipment that allows the conveyor line to have the necessary balance of output from batching plant with a consequent constant filling rate on conveyor and effective RCC placement. The bridge conveyors are placed down along the slope of the mountain and equipped with a self-supporting steel lattice structure, with a 50 metre free span.

STM has designed and developed an innovative swinger conveyor. It is a special conveyor capable of 360° rotation that follows the growth of the dam changing the slope of the conveyors (span = 50 metres) for the distribution of the concrete.

STM has been able to reach these outstanding achievements thanks to the company's focus on: expertise in every area of activity; strong attention to the customer; passion for innovation and improvement; and close attention to quality.

Ulu Jelai Dam in Malaysia.

Maximizing cement dust filtration efficiency with new technology

Blocked filter cartridge.

Particle filters are an essential component of a cement storage silo, providing safe ventilation of air without expelling product into the atmosphere. However, this leads to product being entrained in the filters, resulting in loss of efficiency and creating risk. UK-based silo pressure safety experts Hycontrol point out that during the pneumatic filling of storage silos excess pressure can become trapped inside. The dangers posed by over-pressurization of silos should not be taken lightly.

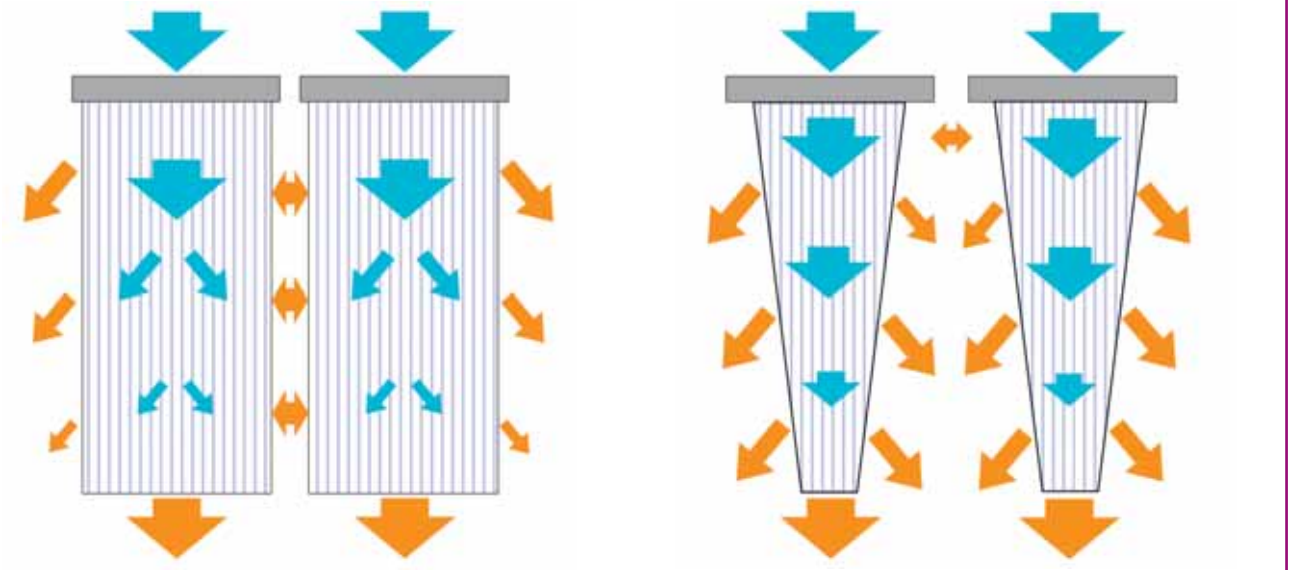
An efficient air filtration system is an essential part of a comprehensive silo protection system. Filter housings mounted at the top of silos are designed to vent air blown in during filling, whilst preventing cement dust particles from escaping into the atmosphere. Designs vary, but modern systems are usually based on filtration using either bag filters or cartridge filters which utilize porous media to trap dust particles. As the replaceable filter media becomes entrained with dust and filtration efficiency drops, users should be able to easily remove them to insert fresh filters. Normally filter housings are fitted with some form of self-cleaning system.

Blocked filters are a common contributor to silo protection problems. With time and regular filling/emptying of cement, eventually the cleaning system will not be able to remove powder entrained in the filter. If dusty air cannot be cleaned and escape through the filters then it will blow out through the pressure relief valve. This poses a significant risk as cement carried in the air-flow will harden when mixed with atmospheric moisture, leading to the PRV becoming blocked over time. This problem becomes acute during the filling process if increasing air pressure inside the silo cannot be safely vented. In the past, this has led to silos rupturing or the filter unit physically being ejected from the silo roof by pressure. Consequences of such an incident could include:

- serious, even fatal injury to workers or the public;
- catastrophic silo damage;
- loss of material and production;
- harmful environmental pollution; and
- damage to company reputation and significant Health & Safety fines.

Key to ensuring reliable filtration is the velocity of air flow within

Figure 1.



Traditional design **Hyvent design**

the filter unit casing between the cartridges. This is referred to as the 'can velocity'.

Can velocity must be consistent along the full length of the filter at a sufficient strength that allows the dust dislodged during pulse cleaning to escape from the cartridge surface and fall away into the vessel below. If the velocity is too low, the loss of pressure towards the bottom of the filter cartridges (furthest from the air jet nozzles) will not be enough to dislodge the dust particles resting in the filter. If the velocity is too high, dislodged dust is re-entrained in the air flow and is re-deposited on the cartridges — or dust is simply blasted from one filter cartridge into its neighbour.

The latest advances in filter technology, utilized in Hycontrol's Hyvent unit, allow for greatly increased airflow within the vent unit, whilst simultaneously reducing air velocity from below. This has been achieved by changing to a conical filter shape, as opposed to the old-style cylindrical cartridges.

By greatly increasing the space for free air flow from below the can velocities are reduced. Lower velocities of circulating air make it easier for dust particles to drop out of suspension back into the vessel below, thereby reducing re-entrainment into the cartridges. The increased space between the filters reduces the likelihood of dust being passed to neighbouring cartridges, particularly when the airborne dust is moving at a lower velocity. This will help quicken the rate at which the dust drops out of the filter. The less dust that is retained circulating in the filter unit, the less dust that will become re-entrained into the filter media, resulting in better performance and a longer lifespan for the filter cartridges.

Finally, the design results in greater cleaning efficiency by the compressed air jet. Figure 1 shows the flow of compressed air into the cartridge and the reduction in dust expulsion resulting from decreasing air pressure. Traditional cartridge filters (on the left) suffer from reduced air flow towards the bottom as pressure is lost.

Hycontrol's Hyvent unit.

Conical filters (shown on the right) offer an improvement by evenly distributing pressure down through the cartridge, maximizing product removal. The tapering of the inner core of the filter elements enhances the effectiveness of the compressed air jet, giving a more even clean over the length of the cartridge. Collectively these features mean the new-style filters have a longer functional life and offer a higher consistency of performance.

A modern, high-efficiency filter unit should fulfil several criteria:

- easy access to filter cartridges for maintenance and changing;
- correctly-calculated size to deal with the maximum volume of air-flow;
- efficient self-cleaning system (ideally reverse pulse air jets firing down into the filters); and
- latest enhanced filter cartridge design to ensure optimum performance.

Hycontrol recommends thorough service assessments of filter units be conducted every six to twelve months depending on the frequency of filling. DCi

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Big Bags

Bagging & FIBCs

Jay Venter

120 Big Bags per hour: high-speed packaging taken to a new level – STATEC BINDER sets international standards

STATEC BINDER is recognized for its high quality and precision in High Speed Packaging & Palletizing and at the end of 2016, the company has once again confirmed its reputation. A Big Bag station in Austria went into operation, which is capable of filling up to 120 bags of granulated fertilizer per hour. At 80 Big Bags per hour, the machines already count as being amongst the fastest in the industry — therefore the company confirmed quite impressively the position of STATEC BINDER as one of the world's leading suppliers of packaging machines.

Unique high speed technology

The product passes through a weighing container and filler neck into the 600kg capacity, woven polypropylene bags. The proven dosing and weighing system ensures maximum accuracy.

As soon as the employee attaches the empty bag to the filler neck and it is held by the pneumatic bag clamp, the inner bag of polyethylene is inflated by a fan and filled with the granulated fertilizer. A second employee then opens the bag clamp and closes the inner bag. Due to the integral strap on the Big Bag, up to three Big Bags can be threaded and removed by a fork lift truck at the end of the conveyor belt.

About STATEC BINDER

STATEC BINDER is a global specialist in providing flexible solutions for packaging and palletizing of bulk goods. Located near Graz in Austria the company has already supplied more than 1,100 machines all over the world.

Whether petrochemical, animal feed production, rice, seeds, sugar or fertilizer, the high quality product range offers customer-specified solutions for all industries. The packaging systems are offered for polyethylene (PE), polypropylene (PP) and paper bags with filling weights of 5kg up to 50kg and big bags.

With 40 years' experience STATEC BINDER is a worldwide market leader in high performance open-mouth bag packaging and stands for absolute reliability, innovation and precision.

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Mondi shows paper-based bag solutions at interpack that pack more than expected

At this year's interpack trade fair, held 4–10 May 2017, Mondi's Industrial Bags business presented paper-based bag solutions that protect sensitive powdery filling goods, prolong product shelf life, meet the highest safety and hygiene standards, and are easy to handle. In particular, the company showcased customer solutions for three industries in focus: food & beverages, home & personal care and building & construction.

Among Mondi's broad range of solutions for the featured customer industries, the following product highlights could be seen at interpack:

- Hot Lock Bag® for high hygiene and safety standards required by the food industry
- SPLASHBAG for protecting moisture-sensitive building and construction material from rain
- Eco bag series for sustainable solutions in the home and personal care industry

PE-inliner bags with Hot Lock Bag® sealing are Mondi's reliable solution for the particular needs of the food industry. Food producers require packaging that meets stringent health and hygiene standards. Produced under strict hygienic conditions, these open mouth bags combine functional features for easy closure, reliable storage and convenient opening.

- The PE-Inliner bag acts as a moisture barrier for hygienic and safe packaging and optimal protection. It can be sealed separately after filling for increased protection.
- The Hot Lock® sealing technology ensures reliable closing under strict hygiene standards.
- **Sustainable:** the PE inliner can be easily separated from the outer paper ply for optimal recyclability.

SPLASHBAG is a water-resistant paper bag that meets the needs of customers in the building and construction industry. It was developed in collaboration with cement producer LafargeHolcim. SPLASHBAG is particularly suitable for protecting moisture-sensitive filling goods. It is made from Mondi's wet-strengthened, machine-finished Advantage Protect sack kraft paper, and is formulated to maintain high tensile strength even in wet environments.

As a result, SPLASHBAG absorbs less moisture than conventional paper bags and maintains the integrity of the product quality, while at the same time matching the filling speed of standard paper bags. Even after two hours of direct exposure to rain, SPLASHBAG can still be moved, handled and emptied without difficulty. It significantly reduces bag breakage rates, leading to genuine cost savings through reduced waste, lower vehicle and site clean-up costs, fewer trips from warehouse to site and time savings for logistics and site managers.

Reusable PVC bulk bags are the Wright Choice

When it comes to baking and what goes into making high quality products, family-owned GR Wright's has learned a thing or two over its 150 year history. A tradition of quality, innovation, and best production practices have enabled the business to survive as London's only remaining miller and to expand its product range to include a range of baking ingredients and mixes.

"Over five generations, the Wright's name has been synonymous with superior quality" explains Richard Phipps, Factory Manager at Wright's Baking Ingredients division. "To meet the increasingly stringent standards expected in the food industry, it is very important that the very highest standards are maintained throughout the entire production cycle and that includes continuous investment in the facilities and plant."

So, when it came to choosing 150 new bulk storage bags for use in its state of the art production facility at the company's multi-million pound development at Delta Park, Enfield, Wright's turned to one of Europe's leading suppliers of flexible fabric products, Structure-flex.

Phipps continued: "The bulk storage of the ingredients that go to make up our speciality mixes is a crucial part of the production process and the one tonne bags are used during the manufacture of the mixes and for their temporary storage after they have been combined.

"The bags are moved through the facility as the manufacture process progresses and, depending on the ingredients, the final mixes are stored for anything up to two days in the factory whilst they are rested or packaged ready for shipping. It's vital, therefore, that the bags are strong, reliable, and reusable."

Experts in fabricating long life products from heavy-duty flexible reinforced fabrics, Structure-flex supplies and manufactures a range of bulk packaging systems from 500kg up to 24 tonnes in capacity — ideal for a wide variety of industries.

The concept of the bulk bag is a simple but effective one. Specifically designed and manufactured from reinforced thermoplastic-coated material, the bag is the ultimate reusable, multi-trip container for use in demanding applications and environments.

Structure-flex tailor produce the bags in a variety of colours, shapes, and sizes, with the option of applying specific lifting mechanisms such as straps or rings, or including drawstrings, special closures, skirts, or baffles to correspond with the required filling and discharging equipment.

This customization was another important feature for Wright's: "We blend a number of different products in the factory and each bulk bag needs to be re-used for the production of the same blend of ingredients. To meet with our rigorous control processes, a colour coding and numbering system is used so that every bag can be tracked through production and identified at each stage.

"Hygiene is also critical factor for us and all our products comply with strict health and safety regulations. Cleanliness and the ease of cleaning was an important consideration and, with the life expectancy of each bag being many years, they will have to undergo the cleaning process a large number of times during that period."

As Structure-flex's thermoplastic bulk bags are capable of a great number of uses and can last for many years, they are very cost effective and have a reduced environmental impact compared with disposable alternatives.

Phipps concluded: "The bulk bag technology has been the best solution for our needs and the flexibility of use and customization of the product has enabled them to dovetail in with our processes. Wright's has purchased bulk bags from Structure-flex for a number of years and never any issues with any of them."

The cement sack of the future at Chinaplas 2017

When it comes to safe and sustainable packaging for bulk goods, there is no overlooking the Starlinger AD*STAR® block bottom valve sack. Produced in a heat sealing process from coated polypropylene woven fabric, this sack outperforms all comparable products in terms of break resistance and durability and is also versatile, economical and environment-friendly.

The latter has been confirmed by a recent life cycle analysis, in which AD*STAR® sacks scored better than either sewn cement sacks made from polypropylene tape fabric or paper cement sacks. This study, which compared AD*STAR® cement sacks with cement sacks from China (sewn sacks made of recycled woven polypropylene tape fabric) and Saudi Arabia (paper sacks), shows that AD*STAR® sacks have the lowest greenhouse potential of them all. Also by other criteria such as acidification potential, ozone depletion potential, energy and water consumption, they were demonstrably the most eco-friendly. "A changeover to AD*STAR® sacks for cement packaging would be of special interest to China," says Hermann Adrigan, sales director of Starlinger, assessing the situation. "Not only would it ease the impact on the environment by considerably reducing CO_2 emissions, but using AD*STAR® sacks would enable the automation of the entire chain of cement filling and transport processes to a much higher degree. This would greatly benefit the ongoing modernization on the Chinese cement sector."

140 SACKS PER MINUTE AND MORE

AD*STAR® block bottom valve sacks are produced using a special heat sealing process on ad*starKON conversion lines from Starlinger. These lines achieve production speeds of 100 to 140 sacks per minute, operating on the basis of the heat sealing process patented by Starlinger. ad*starKON conversion lines feature a wide range of product options: In addition to block bottom sacks with or without valve, as well as lined and BOPP laminated block bottom sacks, they can produce AD*STAR® *carry bags and REICO*STAR® block bottom sacks made of spunbonded fabric. Quick, simple and almost entirely automated format changeover offers sack producers maximum flexibility for the production of varying sack sizes and designs.

Starlinger will be at Chinaplas, Guangzhou/China, May 16 – 19, 2017, Austrian Pavilion, W1B41

*Note: AD*STAR® and REICO*STAR® are registered trademarks. AD*STAR® and REICO*STAR® sacks are produced exclusively on Starlinger machines.*

interpack: Starlinger presents trendsetting woven packaging made of PP and rPET

In keeping with the motto "Sewing is the past", this year's exhibit by Starlinger & Co. Ges.m.b.H. at interpack in Duesseldorf featured live production of IC*STAR® *(I = Innovative, C = Closing)* sacks.

These are produced on the new conversion line multiKON KX, equipped with the sealTEC bottom closing module developed by Starlinger in co-operation with the Austrian packaging systems manufacturer Statec Binder. The IC*STAR® method involves the welding of a closure strip onto the sack bottom by means of hot air in a continuous process, without the need for glue. The sack mouth remains open and, after automated filling, can be either closed with another closure strip or sewn shut. "The big advantage of IC*STAR® sacks is that, unlike sewn sacks, they are sealed completely tight with the welded closure strip," explains Hermann Adrigan, sales director for Starlinger. "The IC*STAR® construction also practically eliminates the seam allowances required for sewn sacks, and greater strength in the sack bottom enables the use of lighter fabric. Both factors add up to cost savings in raw material – in this case polypropylene – and a reduction of the carbon footprint. Our customers are sensitive to these arguments." The new process lends itself to production of coated or uncoated IC*STAR® sacks, as well as sacks with gussets. Oil-free production makes them ideal for packaging food products such as rice, coffee, salt, sugar or flour in bulk quantities. Since the official market launch last October at the K exhibition in Duesseldorf, the first IC*STAR® conversion lines have already been delivered and installed.

FROM BOTTLE TO SACK – WOVEN PACKAGING FOR CONSUMER GOODS FROM rPET FLAKES

Another focus of the Starlinger exhibit was woven packaging from rPET flakes. This new technology developed by Starlinger is meeting with lively interest in the packaging sector: it uses material from used PET packaging such as bottles to produce tapes for weaving and, from these, big bags and sacks. Especially in consumer goods packaging, many stakeholders already place high priority on sustainability. "Sacks made from PET are noted for their specific characteristics such as stiffness, effective grease barrier and aroma protection. These make them the ideal packaging for all kinds of consumer goods," comments Stéphane Soudais, general manager of Starlinger's Consumer Bags Division. "PET is also one of the few types of plastic which enable closed loop production. With our technology we can make PET bottle flakes directly into woven tape fabric, which is then used in production of container bags or consumer goods packaging like the PP*STAR pinch bottom sack laminated with BOPET film. The rPET sacks are recyclable after use and can be used in the production of new sacks or for other applications."

*Note: PP*STAR® and IC*STAR® are registered trademarks. PP*STAR® and IC*STAR® sacks are produced exclusively on Starlinger machines.*

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