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FEATURES

- Bulk Trades Outlook
- Dutch Ports Focus
- Bulk Vessel Forecast
- German Regional Report
- Continuous Ship Unloaders

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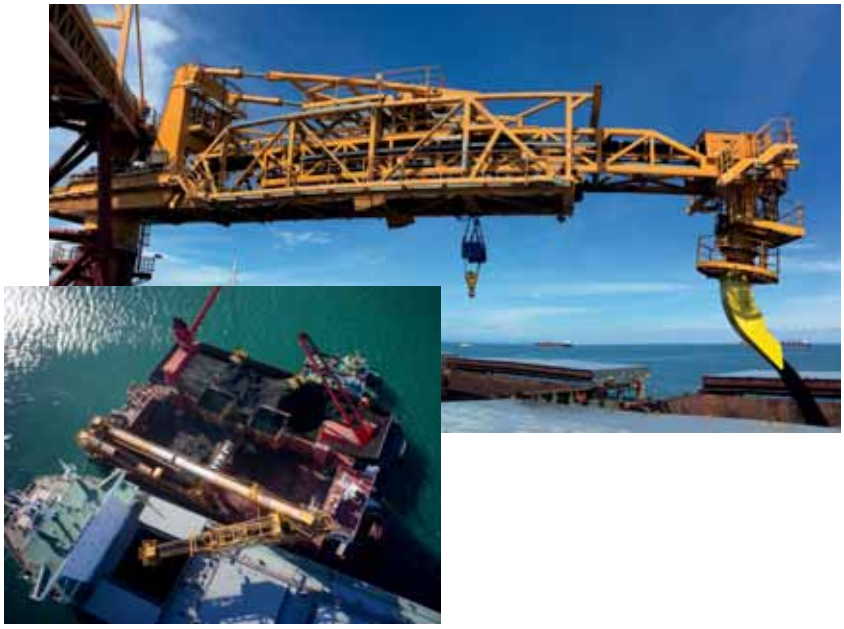

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Coeclerici's Floating Transfer Station Bulk Celebes *during operations. The FTS is part of a fleet of four units working for PT Berau Coal to perform coal loading operations at Muara Pantai anchorage in Indonesia. Thanks to her specific loading equipment on board, FTS* Bulk Celebes *is able to perform blending operations.*

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Contrasting patterns in grain and soya trade

Commodity movements around the world showed signs of reviving growth during the past twelve months. Although adverse influences remained prominent, global seaborne dry bulk trade apparently increased slowly in 2016. A continuation of this trend may be seen over the year ahead.

The subdued pace of economic activity is providing only limited support for trade. Average world GDP growth last year is estimated to have been below the previous year's 3.1% rise. and forecasts for 2017 suggest just a limited improvement to 3.3% (based on OECD figures). China's economy is expected to decelerate further, while most of the contrasting slight pick up elsewhere probably will occur in the USA.

Grain

Prospects for grain trade (wheat, plus corn and other coarse grains) in the current 2016/17 crop year ending June have brightened, compared with earlier expectations, but a small 2% decline to 338mt (million tonnes) is still indicated. As shown by table 1, a summary of recent International Grains Council calculations, lower imports into the Asian region are the main reason. In particular, China's grain imports seem set to continue falling amid attempts to reduce excessive domestic corn stocks.

A different pattern is occurring in the soya trade segment. According to US Dept of Agriculture estimates, global soyabeans and meal movements are likely to maintain an upwards trend in marketing year 2016/17 ending September. The total is expected to exceed the symbolic 200mt level for the first time, reaching 202mt, a 4% increase. Imports of beans into China are forecast to grow by 3%, to 86mt.

Iron ore

After regaining growth momentum last year, is another large increase in world iron ore trade foreseeable in 2017? In other commodity sectors attention immediately focuses on China, which usually has the greatest potential for large annual changes in import cargo volumes. Assessing iron ore movements is similar. Among the main iron ore importing countries, Japan, European Union members as a group, and South Korea appear to have experienced flat or decreasing volumes in the past twelve months. By contrast China, the dominant importer, sharply increased its 2016 quantity to over 1 billion tonnes. During the next twelve months Chinese buyers may again raise their purchases, as further substitution of domestic supplies occurs. Other key buyers may see flat volumes or limited growth.

Coal

Changes in global coal trade are no longer mainly dependent on commercial factors such as economic activity, energy consumption, inter-fuel competition and relative prices. Environmental influences have become much more instrumental in shaping trade flows, and these influences are largely determined by national government and international policies, which in turn reflect political decisions.

Forecasting global coal trade consequently is now more subjective. Last year saw another decrease in the total, based on preliminary figures. But the downwards trend was greatly restrained by an upturn in China's imports, after the preceding rapid reduction. Following another large decline in 2015 to 204mt (including lignite), China's coal purchases last year are estimated to have risen by over one-fifth. Some forecasts suggest that this revival could be maintained in the year ahead.

Minor bulks

A sizeable part of minor bulk trade consists of fertilizers, comprising raw materials and semi-finished products. World seaborne movements of urea, sulphur, potash and phosphates appear to have exceeded 150mt last year, a similar volume to that seen in the preceding twelve months, and may remain fairly stable.

Bulk carrier fleet

During 2016 the world fleet of Handysize (10–40,000dwt) bulk carriers evidently grew at a similar rate to that seen in the two previous years. Newbuilding deliveries were lower last year, but scrapping also declined as shown by table 2. In 2017 this pattern of slow growth could persist, based on highly tentative calculations.

TABLE 1: GLOBAL WHEAT & COARSE GRAINS IMPORTS (MILLION TONNES)

	2011/12	2012/13	2013/14	2014/15	2015/16*	2016/17*
Asia (excluding Japan)	58.4	58.6	73.6	89.0	95.1	87.3
Japan	23.0	24.3	23.4	21.9	22.1	23.1
Middle East	46.0	48.4	54.0	56.7	54.8	53.4
Africa	59.0	56.3	65.3	67.1	75.7	74.4
Others	84.6	83.1	94.0	87.5	96.0	99.4
World total	**271.0**	**270.7**	**310.3**	**322.2**	**343.7**	**337.6**

source: International Grains Council, 24 November 2016 **forecast* *July/June crop years*

TABLE 2: HANDYSIZE 10–39,999DWT BULK CARRIER FLEET (MILLION DEADWEIGHT TONNES)

	2011	2012	2013	2014	2015	2016*
Newbuilding deliveries	10.3	10.4	6.3	5.4	6.6	5.0
Scrapping (sales)	5.3	8.3	6.7	4.2	5.2	4.0
Losses	0.2	0.1	0.1	0.0	0.0	0.0
Plus/minus adjustments	-0.9	-0.6	-0.1	0.0	-0.1	0.0
World fleet at end of year	**89.2**	**90.6**	**90.0**	**91.2**	**92.5**	**93.5**
% change from previous year-end	+4.6	+1.6	-0.7	+1.3	+1.5	+1.1

source: Clarksons (historical data) & Bulk Shipping Analysis 2016 forecast **forecast*

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Adani acquires Abbot Point Bulkcoal


Abbot Point Coal Terminal.

In Australia, Adani Ports and Special Economic Zone (APSEZ), which is a subsidiary of its Indian parent company, has signed an accord to purchase Abbot Point Bulkcoal (APB), which operates Abbot Point Coal Terminal, in the state of Queensland.

As part of the deal, Abbot Point Operations (APO) will acquire 100% of the equity in APB. This is currently held by Glencore Coal Queensland. However, the deal can only go ahead if certain approvals are forthcoming.

The Port of Abbot Point currently features just a single coal terminal: Adani Abbot Point Terminal. This handles around 50mt (million tonnes) of coal annually, either as firm take or pay contract.

The Adani Group acquired APB on 1 June 2011 on a 99-year lease from the government of Queensland.

A release by the company noted, "The acquisition of APB gives APSEZ an access to operate 50mt per annum capacity in a developed economy on a cost plus basis with no capital investment. APO would operate as a stand-alone entity from AAPT and Adani Mining."

Barry Cross

Conuma Coal re-opens another coal mine

On 2 January this year, Conuma Coal Resources restarted the Wolverine Mine near Tumbler Ridge in British Columbia, Canada.

Energy and Mines Minster Bill Bennet made the official announcement. "Restarting the Wolverine Mine is tremendous news for families living in and around Tumbler Ridge," said Bennett. "This mine will create approximately 220 new good-paying jobs in the region on top of the 170 jobs created when Conuma Coal reopened Brule Mine in September [2016]. The restart of these two mines is a significant boost to the economy in the Peace Region."

The Wolverine Mine, located approximately 15 kilometres west of Tumbler Ridge, was purchased earlier in 2016 from Walter Canada, along with the nearby Brule and Willow Creek coal mines, by Conuma Coal.

The hiring process for Wolverine has already started.


Conuma Coal reopened Brule Mine in September 2016.

Conuma Coal plans to have the mine fully staffed and operating at full production levels by 1 April this year. The company estimates it will produce 1.5 million tonnes of metallurgical coal annually from the Wolverine Mine.

Ministry of Energy and Mines staff are also reviewing Conuma Coal's proposal to possibly restart production at the Willow Creek Mine in July 2017. Timing for the restart of the Willow Creek Mine is dependent upon Conuma Coal's ability to complete the necessary work to satisfy all its permit requirements, as well as its internal planning work and decisions to proceed with the future operations expansion.

Building momentum: Australian exporters optimistic about future after tough times

INCREASED DEMAND FOR MINING EQUIPMENT IS AN INDICATOR THAT AUSTRALIA'S RAW MATERIALS PRODUCERS ARE GEARING UP FOR BETTER TIMES

The spectacular bust that followed the boom in commodity markets for the better part of the 2000s placed a significant strain on the Australian economy, in the process forcing mining companies to fundamentally rethink their businesses, *writes Ari Marjamaa, Vice President, Head of Global Market Intelligence, Wallenius Wilhelmsen Logistics.*

After some very meagre years for commodity producers, the fundamentals appear to show the worst is over. Commodity prices have started to recover, and the era of capital investment austerity appears to be a thing of the past as miners look to increase capital expenditures going forward.

China continues to be the main buyer of Australian resource exports, and although its growth is lower than before, the absolute levels of imports remain significant. And data on equipment deliveries during 2016 show increases that suggest that Australian demand for mining machinery could be about to pick up.

From boom to bust

The global commodity boom benefited Australia's resource-rich regions more than most. The number of people employed in coal mining alone rose from 15,000 to 60,000 between 2001 and 2014. More than 20 years of growth in the mining industry was driven largely by China's insatiable desire for the raw materials needed to drive its 'manufacturing miracle', relentless infrastructure development and urbanization.

But as China's economic growth began its overdue slowdown and evolution from an investment-led to a consumption-led economy, the growth in the demand for raw materials dropped, slamming the brakes on the Australian mining industry. The impact was immediately felt both by equipment manufacturers as well as across the supply chain. Current shipments of mining equipment to Australia are on levels last seen in the late 1990s.

However, there is reason to be optimistic. Mine owners have undergone serious restructuring: reducing debt and leverage, cutting costs and investments, and ridding themselves of assets bought in the good times. As such, they are now very different beasts than they were five years ago. With cashflow back in positive territory, slowly their appetite for investments is coming back.

On borrowed time

In fact the miners were faced with little choice but to 'gear up'. As capital expenditures, and with them investments in machinery, were slashed during the slump, a fundamental imbalance started to build up.

As they looked to get as much return on their existing investments as possible, miners boosted production and worked assets harder to bring production levels up. A focus on efficiencies extended the operational life of excavators and loaders, running them harder and longer than ever before.

It's been said that some miners have found ways to reduce idle time by as much as 20%. Similarly, the average lifespan of machines operated in Australia has increased.

Forecasts for Australian resource production point to continued growth from today's record-high levels. This production consumes machines that at some point have to be replaced and at the current low level of shipments, it is quite clear that this replacement is not yet happening at a sustainable level. At some point something has to give. The existing equipment cannot be used forever, and replacement activity will have to increase.

More to come from the Chinese economy

A common misconception when discussing China's economy is that its demand for raw materials is waning. While it's true that growth has slowed, the economy and demand for raw materials from China will continue to grow in absolute terms for a long time to come. Mining behemoth Rio Tinto foresees annual global growth in demand for iron ore of around 2% until 2030, with China still making up the bulk of this demand.

With a population of more than 1.3 billion people, of whom tens if not hundreds of millions more are expected to move into cities over the coming decade, there's no reason to think China's investment in infrastructure — and therefore demand for metals — will go into reverse.

Of course, Australia is not 100% reliant on China. Other countries will also drive demand. As India further industrializes, it will become an even bigger player in the world metal markets, increasingly picking up the baton after China in the years to come.

Experts in agreement

The final piece of evidence is from the Parker Bay Company's quarterly Surface Mining Equipment Index which shows that equipment deliveries in the third quarter of 2016 increased 13% over the second quarter, with particular growth in shipments of smaller machines.

Although it estimates that total 2016 shipments will be down on 2015, Parker Bay states that over the next five years, more than 10,000 trucks and 2,000 excavators/loaders are needed to replace machines deemed unfit for continued operations due to age and wear.

So, while at first glance the thought of a recovery in the Australian mining equipment demand might seem outlandish, the fundamentals suggest we are about to turn a corner. The nation's future strategy for a continued high level of commodity exports will mean further investment is needed on the ground to support this valuable supply chain.

India has overtaken China to become the world's number one steam coal importer.

Dry bulk trade growth regaining momentum

Richard Scott, Bulk Shipping Analysis

Prospects for global dry bulk trade's growth are still a cause of anxiety. But there were some slightly more encouraging signs during 2016, after seaborne commodity movements almost ceased growing in the previous twelve months. An unexpectedly robust performance by China's mineral imports contributed greatly.

Last year's dry bulk trade advance was relatively slow, based on provisional figures, compared with the recent historical average annual rate of expansion. Nevertheless, the pick up from the 2015 growth collapse demonstrated that potential for sizeable positive changes has not been entirely eliminated. Too much pessimism about the trend may prove unrealistic, despite clear indications of restraining influences.

Until 2015, dry bulk trade expansion was robust over a number of years. Three years in which strong 5–6% annual increases occurred were followed by a deceleration to 4% in 2014. Lack of any meaningful growth in the next twelve months was not widely foreseen and was therefore a very negative surprise, leading to a reassessment of longer-term prospects.

Currently there is no clear evidence pointing to a return to the earlier robust upwards trend. Key influences enabling rapid trade advances have receded and seem unlikely to be repeated, at least in the foreseeable future. New sources of large additional volumes are still awaited. Consequently the outlook is only moderately positive.

The better global dry bulk trade performance last year largely

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TABLE 1: GDP GROWTH IN KEY ECONOMIES (% CHANGE FROM PREVIOUS YEAR)

	2012	2013	2014	2015*	2016*	2017*
USA	2.2	1.5	2.4	2.6	1.5	2.3
Eurozone	-0.8	-0.3	1.2	1.5	1.7	1.6
Japan	1.7	1.6	0.0	0.6	0.8	1.0
OECD area#	1.3	1.2	1.9	2.1	1.7	2.0
China	7.7	7.7	7.3	6.9	6.7	6.4

source: OECD Economic Outlook, 28 November 2016 ** forecast* *# mainly USA, Europe, Japan and Korea*

reflected two changes. First, iron ore trade grew more strongly, as a result of China's huge rise in imports. Second, coal trade apparently saw a much smaller reduction, benefiting from a bounce-back in China's import demand which increased rapidly after the previous year's large decline.

World economy background

During the past couple of years the world economy has under-performed. Industrial activity in many countries affected by this pattern experienced weak growth or stagnation which, in turn, had implications for a number of dry bulk commodity trades. A trend of slowing growth in China continued and was especially significant, while among the advanced countries — mainly USA, European Union, Japan and Korea — economic progress remained subdued.

Recently published estimates by the OECD organization, showing gross domestic product (GDP), a measure of goods and services output, are summarized in table 1. These calculations put the world GDP growth rate for 2016 slightly below the previous year's figure, at 2.9%. In the OECD area group of advanced countries a much lower 1.7% is estimated, well below the 2015 increase. China's relatively fast expansion is still slowing, to an estimated 6.7% last year.

How will these economies perform in 2017? Only the USA among the advanced countries is expected by the OECD to achieve a noticeable acceleration, raising this group's GDP increase to 2% and assisting the world growth rate to strengthen by almost a half percentage point to 3.3%. Further slackening in China to 6.4% is predicted, acting as a prolonged restraint on global progress.

According to OECD economists the world economy remains stuck in a 'low growth trap' with no obvious means of escape unless economic policies are changed to provide more support. The slowdown in investment spending is highlighted: weak business capital investment and weakening public spending on investment projects. These trends have a direct impact on industries and activities closely related to use of imported dry bulk commodities.

Europe's GDP growth is forecast to remain well below 2% in 2017, despite the added support from loose monetary policy and accompanying low interest rates. Both economic and political problems are prominent. Domestic demand — consumer and business spending — is being restrained by high unemployment and high debt levels in some countries.

In Japan, economic growth seems to have settled into a pattern of annual increases of not more than 1%. Although the government has been actively attempting for some time to raise this sluggish pace with both fiscal and monetary policy changes, effects so far have been modest,

Attention is focused on China because this economy has such an enormous impact on global dry bulk trade. A sustained slowing is in line with predictions, and is an intentional result of Chinese government policy aims. Shifting the balance away from investment spending and exports, towards consumer spending, is expected to cause further slackening to approach 6% annual GDP growth. But last year additional policy stimulus measures were introduced to prevent growth decelerating too sharply.

Steel industry trends

Demand for steel and production volumes are affected by patterns of spending contributing to economic activity. Changes in steel production, in turn, determine raw materials consumption and also influence import demand, mainly for iron ore and coking coal, in countries depending on foreign supplies. A large proportion of global seaborne dry bulk trade is comprised of these commodities.

In most of the main countries importing raw materials — China, the European Union, Japan and South Korea — steel demand and production experienced weak market conditions in the past twelve months. Further decreases or only minimal growth was seen. These developments were highlighted in the World Steel Association's recent estimates of annual steel demand changes, which are not always exactly parallel with actual production variations.

The WSA expected demand for steel in 2016 as a whole to prove marginally higher within the EU, growing by just under 1% compared with the previous twelve months. Similarly, marginal 1% growth was estimated for Korea. But elsewhere negative changes were prominent.

Japan's steel demand was forecast to remain about flat in 2016, decreasing by a minimal amount of less than half of one percent, although that represented a distinct stabilization after

TABLE 2: WORLD SEABORNE DRY BULK COMMODITY TRADE (MILLION TONNES)

	2011	2012	2013	2014	2015	2016*
Iron ore	1,048	1,105	1,183	1,330	1,355	1,415
Coal	1,014	1,111	1,191	1,172	1,117	1,100
Grain (including soyabeans)	343	361	390	428	452	462
Other dry bulk commodities	1,630	1,670	1,760	1,780	1,810	1,820
Total dry bulk trade	**4,035**	**4,247**	**4,524**	**4,710**	**4,734**	**4,797**
% growth from previous year	6.5	5.3	6.5	4.1	0.5	1.3

source: Bulk Shipping Analysis, December 2016 **estimate*

the severe 7% decline seen in the previous twelve months. In China a 1% decrease was foreseen, sharply reduced from the 5% fall seen previously.

Indications for 2017 suggested that a mixed picture is likely to evolve. Japan could see a limited 1.4% increase in steel demand, accompanied by similar 1.4% growth in Europe. By contrast, China may experience another decrease, of 2%, while in Korea a 3% reduction is envisaged.

Trade in steel raw materials

Iron ore and coking coal movements comprise about one-third of all global seaborne dry bulk commodity trade. Last year iron ore trade apparently was over 4% higher, based on tentative calculations, reaching more than 1,400mt (million tonnes), as shown by table 2. Conversely, coking coal trade may have been 2% lower at around 290mt.

Global import demand prospects for steel industry raw materials during the twelve months ahead seem positive. However, the potential for growth seems to be mainly concentrated in iron ore movements, and mostly in China's imports. In other countries — Japan, Korea, EU members — a modestly improved economic performance may be seen but advantages for steel demand and production, and raw materials usage, are likely to prove limited.

China's imports comprise over two-thirds of the global iron ore trade total after vast expansion in the past decade. Until two years ago the upwards trend was driven by both expanding steel production and an enlarging proportion of foreign iron ore used (amid a reducing proportion of domestic ore). In 2015 a change occurred when steel production declined, followed by a small rise last year. Iron ore imports growth continued, accelerating greatly in the past twelve months.

The 2016 China iron ore imports volume is estimated to have exceeded the symbolic 1 billion tonnes mark, possibly reaching about 1,020mt, a 7% increase. This large extra volume has led to predictions of further rises, despite recovering international prices. If high-cost Chinese domestic mines, many of which produce relatively low-quality material, implement further output cuts, additional supplies from Australia, Brazil and other countries may be needed. This substitution could continue boosting imports even if steel production weakens. But uncertainties are prominent.

Global coking coal trade, unlike iron ore, is not dominated by China. Another contrast is that the total world volume is much smaller, around one-fifth of the iron ore quantity. Although Chinese imports are a sizeable component, several other countries or groups are of similar significance as coking coal buyers.

Based on provisional calculations, Japan, India and China increased coking coal imports last year, amid maintained or increased steel production volumes. Meanwhile the EU's purchases from foreign origins seem to have fallen, as a result of lower steel production caused by weak domestic demand and tougher competition from imported steel products.

Signs pointing to growth in coking coal movements during 2016 are currently limited. An upwards trend in India's steel production could assist, boosted by the robustly performing economy. Although India has large domestic coal resources, coking coal quality available is generally inferior and quantity is inadequate, ensuring greater dependence on external supplies.

Steam coal trade

Seaborne steam (or thermal) coal comprises the largest part of global coal trade, with over three-quarters of the total. The principal importers, in many countries, are power stations but cement producers and other industrial users are also prominent.

Following an extended upwards trend, a weakening phase has unfolded over the past three years, including a sharp fall in 2015 and an estimated further but smaller decline last year. World seaborne steam coal trade appears to have decreased by 1–2% in 2016, to around 810mt. Although China's imports rebounded in the past twelve months, lower volumes are estimated in the European Union and India.

Environmental influences on coal consumption and trade have become a prominent determining factor. Pressure to cease, or at least heavily curtail, coal burning is having a major impact on import demand. In many importing countries, especially China and within Europe, switching towards cleaner fuels or renewable energy sources, or both, is well under way. This pattern is not universal, however. In other countries, mostly in Asia, the compelling economic advantages of coal are likely to persist.

Several factors are providing sustained support for steam coal consumption and trade. In some countries, long term plans indicate that rapidly rising electricity demand is likely to be satisfied by coal-fired power plants. Construction programmes boosting coal-fired generation capacity are advancing. Growing reliance on imported supplies of coal is often envisaged, even where there is domestic material available.

Among major steam coal importers, Japan is one of the largest. There is uncertainty about future volumes, mainly because nuclear generating is difficult to predict. The nuclear sector, which previously provided almost one-third of electricity requirements in Japan, has been virtually suspended since a severe power plant disaster a few years ago. But a process of gradually allowing these power stations to operate again has begun, implying some negative effects on coal import demand, which benefited from nuclear closures.

India has overtaken China to become the world's number one steam coal importer. During the past two years, however, India's foreign purchases have weakened. Estimates suggest that in 2016 the total may have declined by about 7% from the previous year, to around 160mt. Although a huge coal-fired power plant building programme is progressing, amid a strong upwards power usage trend, domestic coal production has been evolving more strongly, reducing pressure to import coal.

China's steam coal imports fell steeply for two years, and another decline was widely expected to occur in 2016. Instead, shortages resulted in the volume rebounding sharply. A sustained emphasis on cleaner energy sources and specific measures to curb coal use and imports were having a massive impact but, in the past twelve months, domestic coal production was reduced too drastically, causing imports to revive strongly. Domestic output controls are now being relaxed, raising supplies, and much greater uncertainty about future import volumes is evident.

Trade in cereals and oilseeds

Global seaborne trade in grain, soya, plus other oilseeds and meals is greatly influenced, at least in the short term, by the impact of varying weather patterns. These weather variations, typically unpredicted, affect both domestic crops in importing countries (with implications for import volumes) and also determine harvests in exporting countries. Fluctuations in consumption trends are influential as well.

Agricultural commodity trade statistics are usually compiled on a 'split year' basis, labelled as crop, marketing or trade years. This technique reflects the pattern of harvests around the world. Production occurs in 'batches' at set times, rather than as a continuous process throughout any period.

In the grain (wheat plus corn and other coarse grains) segment, figures calculated by the International Grains Council show that global trade in crop year 2015/16 ending June 2016 grew robustly by 7%, reaching 344mt, a record high total. Larger imports by a number of Asian and European countries were notable,

By contrast, during the current 2016/17 year ending June 2017, world wheat and coarse grains trade is expected to be about 2% below the previous year's volume at 338mt, according to recent IGC estimates. Reduced imports into China are likely to be the biggest negative change, partly offset by higher shipments into Europe.

Variations envisaged currently illustrate how changing weather patterns affecting harvests result in import increases or decreases. The weaker imports into China forecast reflect a sequence of good domestic grain crops in the past few years. A build up of stocks (particularly corn) has occurred, which the government is aiming to reduce. In Europe, adverse weather caused a large reduction in the mid-2016 harvest, resulting in additional import requirements.

Trade within the soya sub-sector appears to be maintaining a solid upwards trend. Using a marketing year ending in September, global soyabeans and meal trade in 2015/16 expanded by 6%, reaching 194mt, based on US Department of Agriculture data. In the current 2016/17 marketing year a further 4% increase is forecast, raising the annual total to 202mt.

A huge impetus for the global soya trade uptrend during the past decade has been derived from rapidly expanding soyabeans imports into China. These imports, which totalled 83mt in 2015/16, now comprise over two-fifths of the world volume and are the dominant influence. Purchases by other Asian countries and elsewhere have also grown vigorously.

During the present year, a slower 3% rise in China's soyabeans imports is envisaged by USDA analysts, resulting in an 86mt total. The country's dependence on foreign supplies reflects relatively low domestic soyabeans production by Chinese farmers, coupled with strongly increasing consumption of soya meal and oil. Soyameal is a key ingredient of livestock feed, while soyaoil is used extensively in food manufacturing and domestic cooking.

Looking ahead to the crop year 2017/18 first half, beginning mid 2017, prospects for grain and soya trade are very hazy. Forecasts currently are largely guesses, as predictions of changing and inherently unpredictable weather patterns and their effects on grain and soya production and import demand are not yet plausible. When a more accurate picture is available of mid-2017 domestic harvests in northern hemisphere grain importing countries, calculations will become more useful.

Minor bulks trade: a major element

The minor bulks sector is extensive, including trade in many commodities, some of which are not minor but very voluminous. Consequently this category in total amounts to huge quantities. The diverse range of commodities comprises cargoes related to industrial and construction activity, and also agricultural cargo movements. Altogether this group is estimated to contribute over one-third of global seaborne dry bulk trade.

Steel products and forest products are the most prominent individual elements within the 'industrial' sub-group. Other large components are bauxite/alumina, iron and steel scrap, cement, salt, petcoke plus nickel and other ores. Among 'agricultural' minor bulk commodities are sugar, rice, oilseed meals, phosphate rock, other fertilizer raw materials and semi-processed fertilizer products.

Based on highly tentative calculations, last year's world seaborne trade growth in the entire minor bulks group may have been marginal at around 1%, raising the total to 1,820mt, as shown in table 2. Further expansion could occur in 2017, although at present there is an absence of clear signs pointing to a stronger growth performance.

Key influences on individual minor bulk commodity trades vary widely, and some are specific to one or more movements. But a common factor is slow or slowing economic activity in many importing countries, affecting construction and manufacturing. This pattern appears to have been restricting global Import demand for numerous industrial minor bulk commodities.

A sizeable proportion of the world total is comprised of China's minor bulk commodity imports. These apparently totalled over 270mt in 2015 and may have remained at a similar level last year. The largest elements are forest products and bauxite/alumina. Slowing economic activity and industrial output in China had implications for imports of a number of commodities in this group.

Potential for future growth

Last year's modest pick up in global seaborne dry bulk trade, after growth almost disappeared in the previous twelve months, partly restores confidence in predicting more expansion in the future. Some of the negative influences, which are still visible, may not prove quite as unfavourable as earlier signs may have suggested. Yet there is little evidence to justify expectations of a return to greatly higher overall expansion rates. Currently, only a restrained upwards trend seems likely to resume.

Brazil anticipates positive exports 2017

With prices and demand on the rise, Brazil's commodity exports will benefit greatly in 2017

It is expected that 2017 will be a very good year for the export of the commodities which are of key importance to Brazil's economy, at a time when economic growth at home remains anaemic, *writes Patrick Knight.* The world price of most commodities has been on the rise in recent months, while Brazilian goods have been made more competitive by the sharp fall in the value of the country's currency.

Prospects are particularly favourable for iron ore, as well as for both soya and maize. The start-up of new mills will give a boost to Brazil's pulp industry this year as well.

With imports more expensive, the steel industry hopes to see a recovery on the domestic market, and is eying president Trump's plans for re-building US infrastructure. The US is the leading export market for Brazil's steel, with many US mills importing Brazilian slabs for further processing.

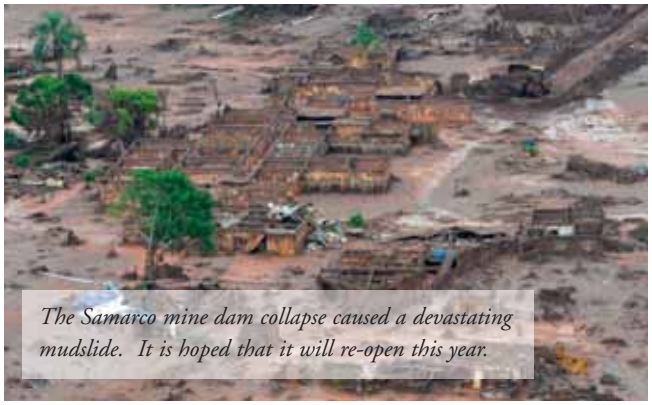
Only cement, hard hit by a sharp downturn in construction in Brazil, expects the situation to be worse in 2017 than it was last year. The industry has the capacity to make 100mt (million tonnes), but only 52mt were made in 2016, so a wave of mergers is expected.

After slipping badly in 2015, the price of iron ore rose by about 60% last year, to end 2016 at close to $80 a tonne. Following new efforts to stimulate the economy of China, now the destination of about half the 400mt of ore exported by Brazil, the world output of steel continues to grow, if slightly.

Vale had anticipated being forced to sell more assets and slow investments. But with revenues $10 billion greater last year than expected, further disposals may not be needed. In common with the world's other giants, BHP and Anglo American, Vale's low production costs give it an edge against most competitors.

It is hoped that the Samarco mine, closed since the end of 2015 following the escape into the River Doce of 30mt of toxic waste after a dam collapsed, may resume production by the end of this year. This would allow pelletization plants in Espirito Santo state to re-open as well. Efforts have been made to ensure that residues left along river banks when the dam burst, are not washed into the river during the current rainy season.

Adverse weather meant that 2015/16 was a relatively poor year for Brazilian soya and maize, so about 5% less grains were exported in 2016 than was the previous year. Attracted by high prices and buoyant demand, farmers have planted more for the 2016/17 crop. A record grains crop of 215mt is now hoped for in 2017, almost 30mt more than last year's crop. 102mt of soya could be available this year, compared with 95.5mt in 2016. The extra will be available for export. A maize crop of 83.5mt is expected this year, compared with 66.5mt in 2016. Last year's very poor maize crop obliged Brazil's massive feed industry to import about 4mt of maize last year, from the United States and Argentina.



The Samarco mine dam collapse caused a devastating mudslide. It is hoped that it will re-open this year.

Brazil's farmers have been encouraged by news that China, the main market for their soya, and now a major market for maize as well, and which imported about 90mt of soya last year, will need to import 110mt by 2022. Most of the extra will come from Brazil.

A new 1.1mt a year-capacity pulp mill built by the giant Klabin company is due to reach full capacity in mid 2017. A new 1.95mt mill being built by the world's largest producer of short fibre pulp, Fibria, is also due to start up by the end of the year. Brazil is now on course to overtake both Canada and China in the next few months to become the world's second-largest producer of pulp, after the United States. Output will soon rise from the present 17.4mt a year to almost 21mt.

With only 10mt of paper made in Brazil, virtually all the extra pulp will be exported. China bought 37% of the pulp exported from Brazil last year, compared with only 14% ten years ago. One concern is that the massive Asian Pulp and Paper company is part way through an expansion programme which will eventually add about 3mt to capacity. About 1mt additional pulp is needed each year worldwide to meet the increase in demand. But numerous high-cost mills in Europe and North America are expected to close in the next few years, leaving space for the lower cost South American and Asian mills.

The large Eldorado company had been expected to start building a second line at its mill in Mato Grosso state soon. But the company's parent, the world's leading meat producer, JBS, has become entangled in the 'car wash' corruption scandal, which helped cause the impeachment of Brazil's last president, Dilma Rousseff. The National Development Bank, the leading source of finance for Brazil's pulp industry, has suspended credit to Eldorado, while the pension funds of two large state owned companies have also withdrawn funds from the company.

Brazil's sugar industry has suffered badly from a lack of investment in the past few years. Because of that, and despite switching emphasis from making ethanol fuel, to making more sugar from the 400mt of cane grown in the country, output has stagnated. Brazil is expected to export only about 1mt more sugar this year than the 25mt of sugar shipped in 2016, despite the difficulties faced by its two leading competitors, India and Thailand and rising prices. An interesting new development is the growing output of 'energy cane' in Brazil. Energy cane varieties contain much more fibre than the traditional ones, which means much more energy can be obtained from burning the cane in modern furnaces than when traditional cane is used. Mills will also be able to made more of what is described as 'second-generation' ethanol, from the extra leaves and tips, than is possible with normal cane. Slightly more sugar can also be produced from each hectare of 'energy cane' plantation than of traditional cane as well. More will be heard of this crop, as it gains adherents. Although Brazil's sugar industry has been through bad times, foreign investors are still being attracted. One of the latest is the Chinese state owned Cofco food company, which has bought four mills in Sao Paulo state, with capacity to crush 15mt of cane. With so many companies in difficulty, Cofco paid only $50–70 for each tonne of the crushing capacity it bought. The price averaged $100 per tonne a few years ago.

Is China playing fair on steel?

Chinese steel 'washing' the market skews global trade

Kunal Bose

Trade measures needed to provide Indian steelmakers with a level playing field

Capacity much in excess of demand — even after accounting for additional steel use in the next few years and rampant exports of underpriced steel products — are the two principal reasons for the woes of the global ferrous metal industry. It was then a 'no-brainer' that the highly excessive steel capacity and production in China, which accounts for half the global steel output and its unfairly priced exports most of the times taking the form of tidal waves washing the markets of receiving countries, would be at the top of the agenda for deliberations at the recently held annual general meeting of the World Steel Association (WSA) in Dubai. If the plaintiffs, in this instance the importing countries hosting injured steelmakers, expectedly peppered their submissions with strongest possible words, the defendant China, however weak might be its case, made attempts to raise the bogey of protectionism and building walls against free movement of goods.

China, which alone had a share of 804mt (million tonnes) of world steel production of nearly 1.6bt (billion tonnes) in 2015, had to export 111.6mt last year — higher than Japan's production of 105.152mt — as domestic use at 672.3mt showed a fall of 5.4% over the previous year. The world outside China was proved wrong in expecting that paying heed to a growing crescendo of protests, Beijing would exercise its powers to rein in production and exports this year. WSA data show China's steel production in the first nine months of 2016 was up 0.4% to 603.780mt on a year-on-year basis. Remarkably China's steel production in September advanced 3.9% to 68.2mt over the same month in 2015 and in October it was up 4% to 68.5mt on a year on year basis. The move to lift production of this order has got much to do with benchmark steel rebar prices on the Shanghai Futures Exchange averaging the highest in July to September of any quarter since the first three months of 2015.

The shared concern of WSA members as was amply evident in their speeches was China raising steel exports by 2.4% to 85.1mt between January and September, the highest ever for the period. A peek into the kind of sneering that was part of Dubai proceedings could be had from interviews given to the media by some participants on the sidelines of the WSA meeting. For example, Nucor chairman and CEO John Ferriola who was elected president of WSA for 2016/17 made scathing comments in an interview with S&P Global Platts in reference to the positive outcome of the series of US trade action against steel imports from China. He said: "Have we seen benefits from it? Certainly. The flat-rolled sheet cases — hot-band, cold rolled and galvanized — have been successful, and we've seen a reduction in the import of subsidized products in those areas. And we're pursuing trade cases now on plate; rebar is coming up again — we hope have the same kind of results there."

While these are statements of facts that apply to other regions and countries also such the European Union and India, Ferriola made some testy (repeat testy) remarks that must have infuriated China to no end. He made no bones about the fact that "so many cases are being filed and that they're being so successfully prosecuted are testimony to just how blatant the cheating has become... It's about time we're taking action... We have laws in place. When people break them, they need to be held accountable for breaking the law." Tata Steel managing director TV Narendran, who also headed WSA economics

committee pointing to the logic of Indian trade action said the "industry that has invested, you don't want to see it suffer because of unfair trade." A year and a half ago, India's steel import duty rates were negligible that made the country a net importer of steel by a long margin last year. But when New Delhi took a series of steps such as minimum import price and anti-dumping duty on several steel products, some reactions were inevitable. According to Narendran, the Indian industry is prepared to deal with any such reactions.

Some weeks after the WSA meeting, Aditya Mittal, chief financial officer of ArcelorMittal, said while announcing the company's third quarter (July to September) results spoke about a "comprehensive trade solution" to unrestrained steel exports by China and some other countries. What Mittal obviously had in mind was broader and more stringent import tariffs by countries affected by arrivals of foreign-origin subsidized steel in large volumes. In the meantime, the US commerce department has launched an investigation into whether Chinese steelmakers are transporting steel through Vietnam to evade US import tariffs.

Don't expect China to be silenced by the rising crescendo of protests by countries suffering because of steel imports. In a well-calibrated response, China Iron & Steel Association secretary general Liu Zhen Jiang claimed, which, however, the rest of the world would not buy, that his country had made "great efforts" to address the overcapacity issue in the industry. In contrast, industry spokespersons from many other countries "spoke volumes criticizing China but they had little to show when it comes to capacity phasing out in their own lands," Liu said. The fact, however, remains the industry in the US and EU in particular have over the years scrapped many high-cost and environment-damaging mills. A few iconic names in the industry in the two regions have disappeared from the map, many mergers and takeovers have taken place and production in developed Western countries has shrunk. For example, US steel production between 2000 and 2015 fell from 102mt to 79mt.

Protection from imports, specially if these are found to be backed by subsidies of kinds militating against free trade is important for the Indian steel industry, which must remain on course to build capacity of 300mt by 2030 against about 120mt now. The enormity of investment and mobilization of all other resources, including skilled manpower needed to achieve the targeted capacity in less than 15 years will not be missed by any. This besides, the domestic steel market must stay in good shape on a sustainable basis to justify investments in new greenfield or brownfield capacity development and modernization of mills in operation. Building a greenfield steel mill will cost around Rs6,000 crore per 1mt capacity.

Because of years of unprofitable working, steel companies owe more than Rs3 lakh crore to various banks making the sector one of the largest contributors to non-performing assets. The government is doing its part to secure better steel prices through its trade actions and raise steel demand by launching a series of infrastructure related projects and supporting house building on a large scale so that the steel industry is able to come out of the debt trap before long. Simultaneously, the banks as they are putting pressure on borrowing steel groups to start servicing loans also remain engaged in restructuring loans. Nothing much has come out of the suggestion that steel groups in distress and in need of further funding get a strategic partner ready to put in money in the businesses and draw recovery roadmaps and participate in their implementation.

The global recovery in steel is a recent phenomenon linked principally to Beijing pepping up infrastructure and house building development. Consider this observation by *The Economist* (repeat *The Economist*): "As the past decade has shown, the ups and down of China's housing market are of global significance. Totting up the property sector's impact on investment and consumption (all the furniture and gizmos that fill new homes), it accounts for about a quarter of Chinese GDP." No doubt the Beijing decision to shore up the housing market had helped the country's GDP growth to stabilize around 6.7%. This is more than what most experts thought would be the case. But is not a property bubble building up in China, which may burst at some stage? Opinions differ and steelmakers around the world are keeping their fingers crossed.

Causes for concern are: Chinese land prices this year, according to an index of leading 100 leading cities, are up 66%; nearly one-fifth of house purchases are for investment and not for owner occupation. While this is national average, investment buying is three times more in leading districts of mid-sized cities; and the same with Chinese house prices — the average rise in prices in the past year is 16% but in major Chinese cities house price inflation was up to three times more. A property bubble building or not, countries hurt by Chinese steel exports must go on putting pressure on Beijing to honour its commitment to cut 150mt capacity in the next five years. The Chinese steel industry with capacity of at least 1.2bt is highly bloated with many mills using old technology and belching huge amounts of smoke polluting the environment. President Xi Jinping's commitment to trimming steel and coal capacity is not to be doubted. But over the decades, the local authorities have managed to subvert central economic directives whose implementation would lead to revenue losses and jobs shrinkage at the provincial level. This may happen with steel also.

Results of leading steel companies in India and elsewhere in Asia in the quarter ended September 2016 are seen as a pointer that the industry has finally reached a turning point for the better. But questions remain as to the sustainability of improvement in steel margins. In an interview with *Metal Bulletin,* Edwin Basson, secretary general of WSA, said: "I am relatively confident that we (the steel industry) have negotiated the turning point. The question is now about future growth. I don't think it will be robust because there is no region at the moment that is strong enough."

Whatever that may be, India hopefully will continue to remain an exception. In its latest short range outlook for the metal, WSA says Indian steel demand after having grown 5.3% to 80.1mt in 2015 will rise 5.4% to 84.4mt this year and then by 5.7% to 89.1mt in 2017. Indian demand growth stands out as the global steel use will be up only 0.2% to 1.501bt this year and then by 0.5% to 1.51bt in 2017. And this is to happen on a low demand base of 1.499bt shrunk by a 3% fall in world steel use in 2015. Nearly 50% rise in steel prices this year is to be considered in the context of recent phenomenal rise in prices of metallurgical coke, which accounts for at least 40% of steel production cost.

Steel Authority of India Limited chairman PK Singh says the world will have to contend with oversupply of steel in the "near future." This means sustainability in steel fortunes cannot be taken for granted in any geography. The situation as it obtains warrants, according to Singh, "protracted trade measures to provide Indian steelmakers with a level playing field." New Delhi sees the logic of Singh's argument as is evident from the recent imposition of anti-dumping duty on imports of wire roads of alloy and non-alloy steel from China. DCi

Traffic boost for Mozambique's Northern Corridor

Port of Nacala.

In Mozambique, the amount of coal being moved by the so-called Northern Corridor will greatly increase as of 2018. The aim is to increase the current annual movement of 8mt (million tonnes) to 22mt.

This will be achievable thanks to the signing of three contracts amendments covering both the North Logistics Corridor (CLN) and the North Development Corridor (CDN). These new agreements, which were signed between the government, the Brazilian operator Vale and Mozambique Ports & Railways authority, will ensure that investments made by concessionaires will become viable. A total of $3 billion is being invested in the Northern Corridor.

In future, Vale will be exclusively responsible for securing finance to guarantee operations on the rail link between the mines at Moatize and the Port of Nacala. Henceforth, all international movements of coal along this line will become more competitive. Above all, Malawi will become a direct beneficiary of the upgrade, given that coal trains from Moatize need to cross its territory in order to reach the coast. These make use of a 1,000km line that was built by the operating consortium.

Barry Cross

Opportunities for GAC arising from market disruption

Major shipping, logistics and marine services group GAC is pushing for greater innovation and flexibility in dealing with turbulent global markets, according to GAC Group President Bengt Ekstrand.

Dubai-headquartered GAC has maintained a solid balance sheet despite slumps in key markets such as shipping and oil & gas. Ekstrand used a conference of GAC company managers in Dubai in mid-November last year to outline the approach that the group would be taking over the next five years.

"Disruptive forces are reshaping our markets almost on a weekly basis but in the process, new opportunities for growth are coming into view," he says.

"Companies that are willing to rethink their business models, put their customers first, and take advantage of new technologies will find ways to prosper in these turbulent times.

"The challenge is to evolve in a smart way and not throw out important values that have served GAC for 60 years."

GAC has continued to invest in capital assets such as vessels and warehouses in key locations around the world despite the difficult conditions. In 2016, total investment commitments have reached more than US$65 million.

"We need to keep our focus on the long term," says Ekstrand. "It's important not to get swept away by the disruptive forces in our markets and start making wholesale changes just for short-term effects."

"Here in Dubai, we've broken ground on a new distribution centre and similar developments are under way in Indonesia and Thailand.

"We've entered a joint venture for operating a container terminal in Cyprus, and we have ordered five new vessels for our Marine fleet."

Ekstrand explained that the biggest challenge was to ensure the skills, values and attitudes of GAC management and staff were kept strong and responsive to changing market conditions.

"GAC is known worldwide for going the extra mile for customers and for maintaining strong and clear ethical and compliance practices," he says. "We have to keep our 'can-do' attitude to the fore while exploring ways to ramp up our use of smart technologies that deliver increased efficiency to our people and increased value to our customers."

About GAC Group

GAC is a global provider of integrated shipping, logistics and marine services. Emphasizing world-class performance, a long-term approach, innovation, ethics and a strong human touch, GAC delivers a flexible and value-adding portfolio to help customers achieve their strategic goals. Established since 1956, the privately-owned group employs over 9,000 people in more than 300 offices worldwide.

Inchcape Shipping Services celebrates new London head office

Leading maritime and logistics service provider Inchcape Shipping Services (ISS), has celebrated the official opening of its new head office in London.

Based in Fenchurch Street in the heart of the City, the new office for ISS' leadership team has been opened to bring it closer to key customers' London offices and more accessible for customers and staff visiting from overseas. Other core functions now based in London include innovation, marketing, sales support and accounts.

Guests joining ISS at the official opening celebrations represented a number of ISS' key customers, trade journalists and other industry contacts.

Chris Whiteside, CEO, at the official opening of ISS' new head office in London.

Chris Whiteside, Chief Executive Officer, ISS said: "Our focus on customer engagement highlighted a need to be located closer to our key principals and London is a key maritime market.

"Feedback on our new London base has been extremely positive from customers, employees and other stakeholders alike and we were delighted to have so many guests join us to mark our official opening."

ISS' office in Chafford Hundred, Essex, remains open for operational teams including Hub Agency Services, Information Technology and the ISS UK operations team.

About Inchcape Shipping Services

Inchcape Shipping Services a major maritime and logistics service provider. With over 300 proprietary offices in 70 countries and a 4,000-strong workforce, the company's diverse global customer base includes owners and charterers in the oil, cruise, container and bulk commodity sectors as well as naval, government and inter-governmental organizations.

ISS provides landside commercial and humanitarian logistics, transit, offshore support, information and data as well as a range of associated maritime services and innovative voyage-management technology. The company additionally offers a growing range of outsourcing services including global crew and marine spares logistics, port hub agency management and sophisticated Enterprise Resource Planning solutions through its subsidiary ShipNet.

Upgrade of Soo Locks would boost economy, says federal report

A federal report lists upgrades to the Soo Locks among 40 proposed projects nationwide to boost the economy.

The locks network at Sault Ste. Marie, Michigan, enables vessels to move between Lake Superior and the other Great Lakes.

The report says more than 60% of the ships in the US and Canadian fleet are so large that they can fit through only one of the locks.

The report says building a second Poe-sized lock would pump up to $1.7 billion into the economy — about three times more than it would cost.

The project was authorized in 1986 but hasn't been funded.

TRACE and RightShip partner to support anti-bribery compliance

TRACE International, the globally recognized anti-bribery organization, has announced a partnership with RightShip, provider of comprehensive online maritime safety and environmental risk management system, to support anti-bribery compliance in the maritime industry through TRACEcertification of vessel owners.

TRACEcertification is a comprehensive due diligence review, analysis and approval process which is based on internationally accepted standards and administered by TRACE. Completion of the certification process underscores a vessel owner's commitment to commercial transparency, reducing risk to charterers.

RightShip's enhanced vetting platform, RightShip Qi, harnesses big data, predictive analysis and real-time risk assessments which allow charterers to make well-informed decisions about the vessels they choose to engage. Risk ratings and credentials for vessels are displayed on the RightShip Qi dashboard alongside the TRACE Compliance Rating (CR), however the CR does not form part of the RightShip risk assessment.

Vessel owners who have completed TRACEcertification receive a rating of CR-1, CR-2, CR-3 or CR-3s. The lower the number, the lower the level of bribery risk associated with that vessel owner. Upon viewing a vessel owner's CR, the charterer is strongly advised to contact them directly to obtain and review a full copy of the TRACEcertification Due Diligence Report regardless of the risk level.

TRACEcertification reduces the cost of compliance throughout the shipping supply chain; vessel owners save time and budget by not having to complete due diligence reviews for multiple charterers, and charterers have pre-vetted entities available to them.

"Shipping is considered a high-risk industry and we are pleased to partner with RightShip to increase commercial transparency in a traditionally opaque industry," said TRACE President Alexandra Wrage. "Completing TRACE Certified Due Diligence is a practical way for vessel owners to demonstrate their commitment to international anti-bribery standards while keeping compliance costs low."

"Shipping carries 90% of the world's trade and RightShip Qi works to improve maritime safety and efficiency," said Warwick Norman, CEO of RightShip. "The TRACE Compliance Rating is an excellent addition to the new platform, promoting transparency and assisting charterers to select the right vessel and the right owner."

This partnership is part of TRACE International's Shipping and Maritime Initiative, established to raise awareness of anti-bribery compliance in shipping with the goal of substantially reducing corruption in the shipping supply chain.

About TRACE

TRACE International and TRACE Incorporated are two distinct entities with a common mission to advance commercial transparency worldwide by supporting the compliance efforts of multinational companies and their third party intermediaries.

TRACE International is a non-profit business association that pools resources to provide members with anti-bribery compliance support while TRACE Incorporated offers both members and non-members customizable risk-based due diligence, anti-bribery training and advisory services.

Working alongside one another, TRACE International and TRACE Incorporated offer an end-to-end, cost-effective and innovative solution for anti-bribery and third party compliance.

About RightShip

RightShip is a leading maritime risk management and environmental assessment organization. RightShip Qi is the organization's comprehensive online risk management platform. Qi brings all the benefits of big data and predictive analytics to maritime risk management, providing users with sophisticated, real-time vetting insights and enhanced reporting capabilities.

RightShip's Greenhouse Gas (GHG) Emissions Rating enables customers to include the growing importance of supply-chain carbon emissions in their vessel selection process. It is now used as a vessel selection tool for 1 in every five ships chartered, equating to over two billion dwt per annum.

We must future-proof industry, says InterManager

InterManager, the third party and in-house ship management association, has urged the maritime industry not to neglect its duty in ensuring a sustainable future.

At the CrewConnect Global event in November last year, InterManager's President Bjørn Jebsen and Secretary-General Capt Kuba Szymanski spoke of the need to work closely with key decision makers to maintain a resilient industry.

Addressing delegates, Jebsen said: "If we look at the overall shipping industry we can assume that the world fleet will continue to grow, which means an increased requirement for skilled and competent seafarers. This may present itself with a few problems, though. With the downturn in the industry, shipping companies are cutting costs and may not make the required investment in manpower for the future.

"This is being seen through maritime schools, which are struggling to provide the education to give young people the training they need to develop the skills and competence our industry requires. We must work together to address a maritime education system that is struggling to meet even the existing requirements."

The notion of ensuring a sustainable future was further heighten by Capt Kuba Szymanski, who chaired a panel on the findings of Project MARTHA; a fatigue study co-ordinated between InterManager and other industry bodies. "We cannot ignore the findings, so what ship managers do next is crucial; whether that be reducing bureaucracy or listening to vessel's staff comments and suggestions," Capt Szymanski said.

"If fatigue is not addressed soon, seafaring could be in jeopardy of becoming an out-of-touch profession. It is vital the whole industry works together, starting today," he added.

New ISO 19030 will have $30bn impact on industry, says Jotun

The International Organization for Standardization (ISO) has now published the long-awaited ISO 19030, a new standard conceived to measure changes in ship-specific hull and propeller performance.

According to Jotun, which has led the industry in the standard's development, the move has the potential to reduce the industry's green house gas emissions by 10%, while saving operators up to US$30 billion in annual energy costs.

Geir Axel Oftedahl, Jotun Business Development Director, Hull Performance Solutions.

ISO 19030 has been more than three years in the making. It's seen a collaboration of 53 expert stakeholders from throughout the industry working together to develop a uniform framework for measuring the efficacy of solutions improving hull and propeller performance. Jotun, a global provider of marine antifouling coatings, has been central to the process, with Geir Axel Oftedahl, Jotun Business Development Director, Hull Performance Solutions, managing the project for its entire duration on behalf of ISO.

"This is a day of celebration for all stakeholders in, and connected to, the global shipping industry," he comments. "Poor hull and propeller performance accounts for around 10% of the world fleet's energy costs [US$30 billion] and greenhouse gas [GHG] emissions. With this standard we can finally quantify how solutions, such as advanced antifouling coatings, can tackle that issue — providing accountability and ROI [return on investment] for shipowners, while detailing the enormous potential for GHG and cost reductions.

"The standard provides a transparency that has been lacking in the industry and will be a central driver for enhancing environmental performance and vessel efficiency. I'd like to congratulate all the key players involved in this process, especially Svend Søyland, formerly of Bellona and now with Nordic Energy Research, who has convened the ISO working group, Standards Norway, including Knut Aune, who has served as the secretariat for ISO 19030, and, of course, ISO itself.

"This is a huge leap forward for shipping and the environment, and it would not have been possible without an extraordinary spirit of collaboration and consensus."

The standard offers a two tier methodological approach: ISO 19030-2, the default measurement method, with the most exacting requirements and greatest measurement accuracy; and ISO 19030-3, allowing for 'alternative methods' and included in order to increase the applicability of the standard.

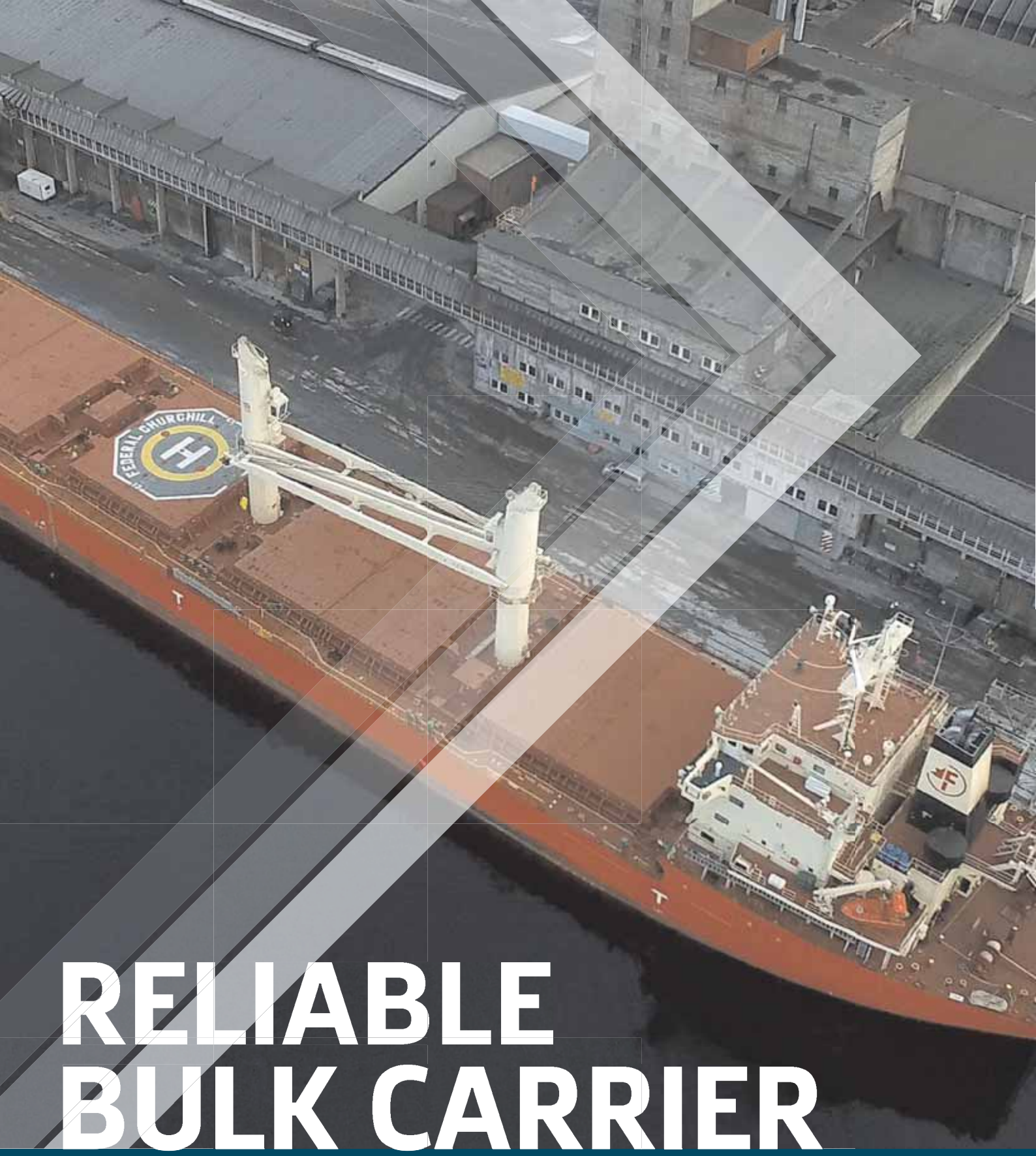
"Jotun, for its part, already adheres to the most stringent demands of ISO 19030-2," notes Stein Kjølberg, Jotun's Global Sales Director, Hull Performance Solutions. "We use it as the foundation for the High Performance guarantee on our Hull Performance Solution (HPS) offering. As the guarantee concerns a very small speed loss, under 1.5%, only the most precise measurement criteria will suffice. For less-demanding performance levels ISO 19030-3 is acceptable.

"We believe this kind of guarantee provides the perfect illustration of how ISO 19030 provides complete transparency and accountability for shipowners."

In developing the standard, the ISO working group met across more than three years and spent over 12,000 hours refining the methodology for publication.

Jotun's HPS, combining advanced SeaQuantum X200 silyl methacrylate antifouling and a full suite of sensors attached to vessel hulls, launched to the market in 2011. It has since proved its ability to deliver long-term efficiency and performance gains. In March last year, the firm released data for the first ever five year dry-docking of a vessel treated with the solution — Gearbulk's *Penguin Arrow*. This documented that HPS, by successfully limiting the growth of organisms on the hull, enabled a fuel saving of US$1.5 million, cutting CO_2 emissions by some 12,055 tonnes, across the 60-month period.

Jotun is a renowned manufacturer of decorative paints, marine, protective and powder coatings. The group has 64 companies and 37 production facilities on all continents, and more than 9,800 employees. Jotun products are available in more than 100 countries through own subsidiaries, joint ventures, agents, branch offices and distributors. The Jotun Group's sales in 2015 were NOK 16.3 billion. The Jotun Group is organized into four segments and seven geographical regions, and has its head office in Sandefjord, Norway.



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Thordon Bearings showcases its tough bearings and seals for river work

Thordon Bearings presented its environmentally safe and long-life RiverTough tailshaft bearings and TG100 shaft seals, which were developed specially for workboats, at the International Workboat Show, which took place in New Orleans, USA, in November/December last year.

The water-lubricated bearing pioneer exhibited its RiverTough tailshaft bearings and TG100 shaft seal, both of which are capable of meeting the tough operating conditions workboats encounter in river and coastal waters.

"Our RiverTough water-lubricated tailshaft bearing system is proven to deliver exceptional performance in abrasive waters, such as those with a high content of sand," said Thordon Bearings Business Development Manager Scott Groves.

Taking stock. RiverTough Bearings prior to delivery.

Referring to Inland Barge Service's push boat *Ramona*, which has been operating with RiverTough since 2007, Groves said: "After nine years of operation in the harsh, abrasive waters of Alaska's Yukon River, Ramona's RiverTough water-lubricated tailshaft bearing emerged completely free of wear and tear.

"When the owner drydocked the vessel to carry out hull repairs, the RiverTough bearing and sleeves had no appreciable wear and tear, which was amazing considering the environment in which Ramona operates."

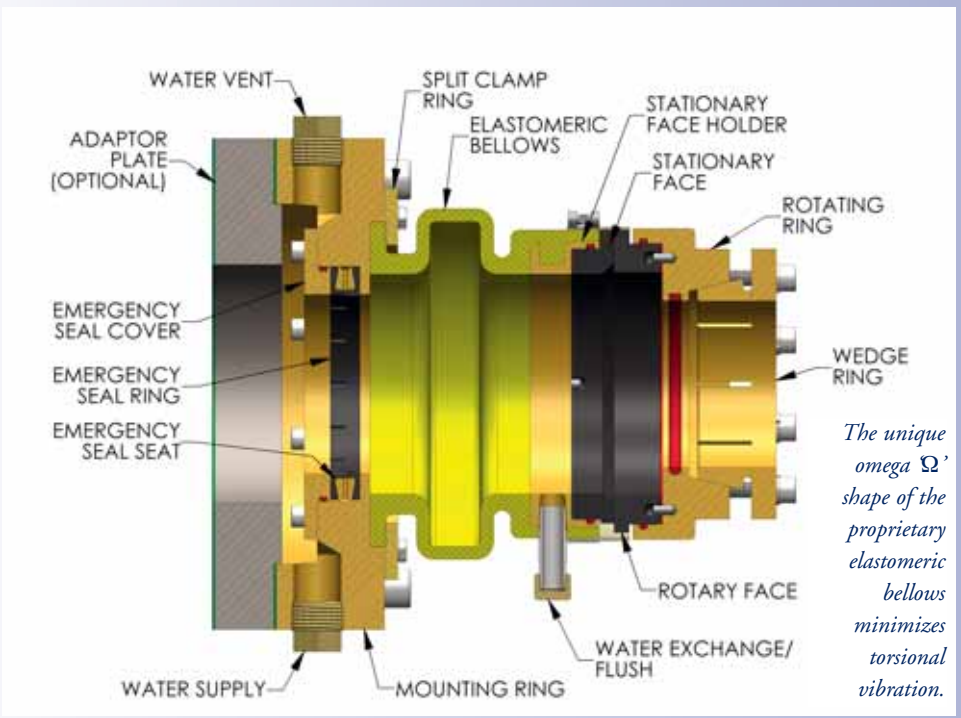
Groves said that Thordon Bearings also has data from workboats operating on the Mississippi showing typical RiverTough bearing wear rates of 0.075mm to 0.100mm (0.003" to 0.004") in 6,000 to 7,000 hours of annual use.

"This provides clear evidence of RiverTough's superior wear life in very abrasive water conditions. They routinely outlast rubber bearings by a factor of two or more," he said.

Thordon showcased its TG100 Shaft Seal at the International Workboat Show. Since its market introduction, Thordon Bearings has supplied more than 180 TG100 seals to operators of a wide range of vessels, including workboats, naval patrol vessels, ferries, yachts, tugs and tow boats.

A unique feature of the TG100 is the emergency seal that permits stand-alone operation to allow the vessel to safely return to the nearest port, preventing permanent seal damage. The unique omega 'Ω' shape of the proprietary elastomeric bellows minimizes torsional vibration and maintains the required spring force throughout the allowable range of axial shaft movement. This elastomeric bellows has no shelf life and no scheduled replacement.

"While the TG100 seal is effective as a stand-alone installation, the optimum solution is in combination with our water-lubricated RiverTough tailshaft bearings, which have now been installed to more than 400 vessels," said Groves.



The unique omega 'Ω' shape of the proprietary elastomeric bellows minimizes torsional vibration.

About Thordon Bearings

A global leader in polymer bearing technologies systems with over 35 years' experience in this technology, Thordon Bearings designs and manufactures a complete range of non-metallic sleeve bearing solutions for marine, clean power generation, pump, offshore oil, and other industrial markets. The polymer bearings operate pollution-free without oil or grease. Thordon Bearings is the only manufacturer of propeller shaft bearings to guarantee its award-winning COMPAC seawater lubricated propeller shaft system for a 15-year wear life.

A bulk carrier market revival beginning?

In the Capesize vessels segment, fleet expansion has been just under 2%.

Richard Scott, Bulk Shipping Analysis

Another distressing period for shipowners operating bulk carriers was endured over the past twelve months. Last year started extremely badly, from an owner's viewpoint, with record low freight rates in the first quarter. But it ended rather less badly, with much higher although still very subdued and unprofitable rates. Tentative signs pointed to a recovery possibly extending through 2017.

The freight market revival seen during 2016 reflected positive contributions from both the demand and supply sides of the market balance. Global dry bulk trade growth picked up, aided by expansion of both coal and iron ore imports into China. Meanwhile slow growth in the world bulk carrier fleet was sustained, assisted by heavy scrapping which offset a large proportion of new tonnage being introduced.

As the year-end approached, optimists began to sense that the prolonged stormy weather might be abating. Nevertheless, views expressed in public mostly remained cautious, since there are few obvious reasons for expecting a strong market recovery. Great uncertainty about several key influences also reinforces ideas that a sustained improvement could prove slow to evolve.

Looking ahead at the beginning of 2017, it seems quite likely that growth in the bulk carrier fleet will continue slackening over the next twelve months, while dry bulk trade could continue growing at a modest pace. These indicators are not always entirely accurate guides to the balance between ship supply and demand, but imply a further move towards a reduced freight market imbalance.

Slowly growing fleet

During 2016 slow fleet growth was again a feature. The world bulk carrier fleet is estimated to have increased in deadweight capacity at a similar rate to the 2.4% increase seen in 2015. Both newbuilding deliveries and scrapping last year were apparently slightly lower than seen in the preceding twelve months.

According to figures compiled by Clarksons Research, at the

In the Handymax group, growth has remained rapid at around 5%.

end of 2015 the world bulk carrier fleet of vessels from 10,000dwt upwards amounted to 777 million deadweight tonnes, comprised of 10,700 ships. By the end of 2016 this fleet probably reached about 794m dwt, based on estimates for the main influences.

Provisional calculations show that newbuilding deliveries last year were slightly below the total seen in the previous twelve months. This estimate may be revised, possibly substantially, as more complete information becomes available. At an estimated 48m dwt, new bulk carriers delivered in 2016 were 3% lower. Sales for scrapping also seem to have decreased, by about 4% to 29m dwt. Net deadweight capacity (newbuildings minus scrapping) added to the fleet last year consequently remained stable, resulting in a broadly unchanged growth rate.

Widely varying growth rates were seen in the past year among the main bulk carrier size groups — Capesize, Panamax, Handymax and Handysize. In the Capesize vessels segment (100,000dwt and larger), expansion appears to have been close to the entire fleet average, at just under 2%.

In the Handysize (10–40,000dwt) and Panamax (65–100,000dwt) categories, slower rises of just over 1% and well under 1% respectively were seen. By contrast in the Handymax (40–65,000 dwt) group, which includes the popular Ultramax bulkers now being built in large numbers, growth remained rapid at around 5%.

How do these deadweight growth figures translate into changes in actual transportation capacity available? Increases or decreases in capacity to move cargoes, within any period, depend greatly on how productively ships are employed. Ship speed, ballast voyage patterns, and duration of port visits including any delays, are crucial Influences affecting the supply of transport services. Statistical data on these aspects is often hard to obtain and therefore fleet deadweight is usually the chosen indicator.

Bulk carrier operation last year continued to feature 'slow-steaming', a service speed lower than 'normal' progress at sea. Relatively low bunker fuel costs eased pressure to proceed at the most economical, or slowest practicable, speed. But weak or extremely weak freight rates, depressing and often eliminating profits, or lack of urgency to deliver cargoes, prolonged slow-steaming. By lengthening voyage duration, this practice effectively removes a significant amount of transport capacity in any given period.

Recuperating trade pace

Over the past twelve months, global seaborne dry bulk trade growth regained some momentum and began to look slightly healthier, based on provisional calculations. More detail is provided in a separate article in this edition of *DCI* (see 'Dry bulk trade growth regaining momentum' from p5), so only a brief overview is included here.

Estimates suggest that the volume of dry bulk trade rose by 1–2% in 2016, a limited but distinct improvement after almost nil growth in the previous year. The world total may have reached around 4,900 million tonnes. These are historically low annual increases, contrasting sharply with much more robust expansion in preceding periods.

Overall trade evolution in 2016 benefited greatly from an acceleration in iron ore trade's growth rate, following the slow rate seen in the previous twelve months. Also contributing was a smaller decline in coal trade. In 2015 coal trade had become a major negative influence, when a huge reduction in this sector offset nearly all the increases in other bulk commodity trades. Last year's negative impact from coal diminished, while the grain and minor bulk trades provided extra volumes, adding to the iron ore pick up.

Substantial changes in China's import volumes heavily influenced events in the past twelve months. Purchases of iron ore for steel mills in China expanded robustly, greatly exceeding most expectations. Coal purchases for power stations and other industries, which had been expected to continue falling, actually increased strongly. This reversal of the trend offset a large part of the declining coal import volumes seen in other countries.

These trade changes are a useful indicator of demand for ships' capacity, although not always an entirely accurate representation. Transport distances also determine the carrying capacity required. When distances for ship's cargo-carrying voyages lengthen, and therefore take a longer time to complete (assuming unchanged speed), demand for shipping capacity rises in any given period of time even when there is no change in the commodity volume transported. When distances shorten, the reverse occurs.

The indicator reflecting both of the transport demand influences is the 'tonne-mile' unit, but statistics compiled on this basis involve complex calculations and assumptions and are not (usually) readily available or up-to-date. So the tonnage volume of cargoes shipped is still often the most useful guide.

Elusive demand/supply balance

Bulk carrier freight market rates during 2016 clearly were influenced by the changes in vessel demand and supply — often known as the 'fundamentals' — already mentioned. Comparing annual deadweight capacity growth in the bulk carrier fleet with annual growth in the volume of dry bulk cargo moved, provides a partial explanation, and sometimes most of the explanation, for freight rate variations. But, especially in the short term, rate fluctuations often reflect other drivers as well.

Among these additional drivers, cargo volumes loaded often vary from week-to-week, or month-to-month, within broader trends while geographical trade patterns also alter, partly for seasonal reasons. In some trades inventory building or destocking by importers has a noticeable impact. Port congestion and delays disrupt cargo flows. Market sentiment and expectations, as well as derivatives trading, are instrumental in driving short term physical freight market rate fluctuations.

Substantial surplus capacity has built up in the bulk carrier market, although estimates vary and the calculation is in any case partly theoretical. The capacity surplus had its origins in the 2008 freight market collapse, and results from many subsequent years when excessive fleet growth (compared with trade volume expansion) persisted. Consequently the market experienced varying degrees of weakness, interspersed with brief upturns which often gave false signals of a sustainable market balance returning.

A comparison of changes in the fundamentals in 2016 broadly aligns with the bulk carrier freight market rates trend. Fleet growth remained relatively slow, while trade volume growth improved. As the deterioration in the underlying balance appeared to be ending, and the approach of a gradually improving balance began to seem feasible, freight rates responded. But the pattern through the year was uneven.

Extreme market weakness, with record low freight rates, was seen in the early months of 2016. There were few signs then pointing towards a stronger trade performance for the year as a whole. Newbuilding bulk carriers were still entering the market at a brisk pace, enlarging capacity.

These circumstances, prompting generally depressed market sentiment, resulted in surging ship sales for demolition, which brought fleet growth down to a minimal amount in the year's first half. When evidence of a tonnage demand improvement progressively emerged, freight rates were pushed upwards from the very low levels prevailing earlier.

Freight market highlights

The Baltic Dry Index (BDI) reflects these changes. This index, compiled each day by the Baltic Exchange, is based on bulk carrier freight rates (mostly time charter hire rates) for a wide variety of ship sizes and employments. It can be regarded as a useful very broad indicator for the entire bulk carrier market.

Continuing a progressive decline in the final months of 2015, to low levels, further dramatic weakness in the BDI was seen in early 2016. This meltdown took the market to an all-time low of 290 index points in February but, in less than three months to the end of April, the index had climbed back up, doubling to 715 points. However, at these levels, bulk carrier charter rates mostly still yielded no profit above ship operating costs.

Over the next couple of months the BDI remained within a fairly narrow range before climbing again later to reach 1257 points in mid-November. From there a downwards movement towards the year-end was seen. Viewing the year as a whole, despite an upturn from extreme depression at the beginning, 2016 was a weak year for the bulk carrier freight market.

Future market vista

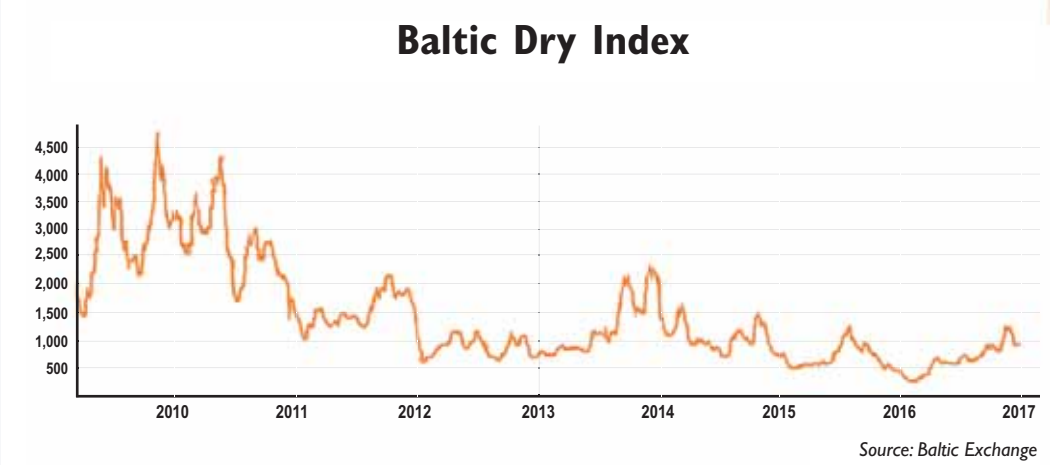
At the beginning of another year, prospects for the twelve months ahead are traditionally reassessed. How likely is a continued move towards a closer demand/supply balance in the bulk carrier market during 2017, implying higher freight rates? A sustained pickup in trade volume growth would certainly assist, especially if it was accompanied by very limited fleet enlargement.

The global seaborne trade outlook arguably seems positive, but great uncertainties are prominent. Politics as well as economics will have a large impact. Economic growth in the advanced countries group is showing no signs of strongly accelerating, suggesting that benefits for many industries such as steel, importing dry bulk commodities, will be modest. Environmental pressures affecting world coal trade are a clear negative factor. Any large rises or falls in China's imports of iron ore and coal will be very significant. These could be partly determined by economic policy changes (with implications for steel and energy demand), or more specific policies related to the coal sector.

A massively reduced world orderbook for bulk carriers, and much lower scheduled newbuilding completions this year, indicates that deliveries will fall sharply in 2017. Assuming that scrapping remains high, the fleet's growth rate could decelerate further. However, as demonstrated clearly over the past twelve months, recycling sales are hugely influenced by how the freight market is progressing and market sentiment about the future. Thus fleet growth predictions are also uncertain.

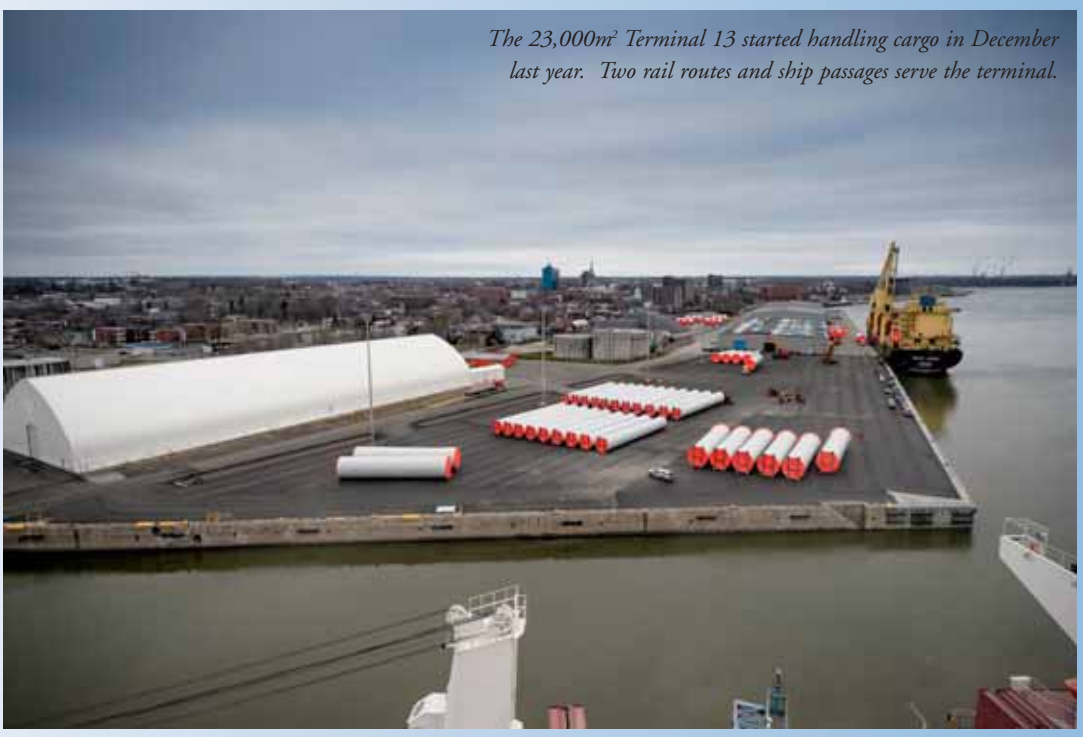
Other influences may have a noticeable impact on the market outcome. A change in the world fleet's average speed over a whole year, even a small change such as half a knot, could have a sizeable impact on carrying capacity, if it occurs. Variations in average voyage distances and port delays and congestion also affect capacity available. None of these factors is easy to predict.

Based on the broad indicators of how trade volumes and fleet capacity could evolve, a further advance during 2017 towards a stronger bulk carrier market could be seen. More consolidation of vessel ownership in this fragmented sector may assist the process. However, progress may be limited, and prove especially difficult to achieve if some of the rather prominent downside risks, affecting key influences, become reality.



Source: Baltic Exchange

Trois-Rivières opens modernized terminal ahead of schedule



The 23,000m² Terminal 13 started handling cargo in December last year. Two rail routes and ship passages serve the terminal.

Work on Dock 13 at the Port of Trois-Rivières in Canada was completed at the end of November last year, a month ahead of schedule and under budget. Since December 2016, vessels have been able to call at the quay, and cargo has been stored in a total area of around 23,500m² (5.81 acres).

Overall better access: new dock with a water depth of 11m

As they had become outdated, Docks 13 and 14 had to be condemned in recent years. "With these works, we are giving back to the port the capacity that was lost with these two docks. This new dock will fully meet the real needs of our users. The port will also provide better access for companies in the region to exterior markets, and will contribute to the creation of jobs. The works on Dock 13 constitute the final element of the Cap sur 2020 plan, which the Port of Trois-Rivières has completed three years ahead of schedule," Gaétan Boivin, president and director general of the Port of Trois-Rivières proudly said.

"We are happy to provide an infrastructure which better meets the real needs of exporters. The new dock will have a depth of 11m, compared with the 10.7m at our other docks. This new depth puts us in a privileged situation where we can handle ships that draw more water. The external storage facilities located adjacent to the dock are modern and offer a significant load bearing capacity," said Michel Parent, director of operations.

The construction works at Terminal 13 included the demolition of the hangar, the reconstruction of Dock 13, the consolidation of Dock 14 and the development of the external storage facilities situated along the docks in such a way as to maximize road and rail access to the infrastructure. This project has also necessitate the construction of Hangars 16, 24 and 25 to replace Hangar 13 which had come to the end of its useful life and had to be demolished to make place for the new terminal.

These projects represent an investment of $50m, financed jointly by the Canadian government ($16.2m), the Trois-Rivières Port Authority ($19m) and the private sector ($15m).

State-of-the-art warehouse for Puerto Ventanas

In Chile, port company Puerto Ventanas recently inaugurated its new La Greda dry bulk warehouse, as part of its Warehouse System Upgrade for Copper Concentrates programme. The 3,200m² facility has a capacity of 46,000 tonnes and is the closest warehouse to the surrounding residential community.

According to managing director Jorge Oyarce, Puerto Ventanas is the leading private port in central Chile. The new warehouse, he added, incorporates all the latest technology in the reception, storage and transfer of dry bulk. Above all, he highlighted the dust emissions capture and control system, which features high quality filters. These ensure that air quality in and around the warehouse can be maintained to a high level and allow Puerto Ventanas to boost its environmental credentials.

"In respect of worker safety, we have incorporated technology that allows operation with lower risk exposure, thanks to a system for remotely monitoring operations," he added.

The overall design of the warehouse allows the port to optimize the footprint of the building, which also incorporates energy efficient lighting.

Oyarce stresses that the warehouse will enable Puerto Ventanas to consolidate its position as the reference company in the movement and storage of bulk solids.

Puerto Ventanas prides itself on going further than necessary in environmental protection, being granted a favourable environmental qualification by the Sistema de Evaluación de Impacto Ambiental company.

Barry Cross

Belledune welcomes 'Tundra' with 2017 First Ship of the Year Award

The Canadian Port of Belledune has welcomed its first ship of the year, the *Tundra*, which called at the port on 5 January this year. The Belledune Port Authority (BPA) officially greeted Captain Sergiy Dolmatov, Master of the *Tundra*.

The *Tundra* is registered in Limassol, Cyprus and her last port of call before arriving in Belledune was Fortalexa, Brazil. The vessel's agent is Calypso Marine Agency (CMA), represented by Robert Lagace. The *Tundra* docked at the Port of Belledune on 5 January 2017, where the vessel loaded approximately 22,000 metric tonnes of wood pellets. The next stop for the vessel was Hull, UK.

The Director of Marketing & Business Development at the Belledune Port Authority (BPA), Jenna MacDonald, presented Captain Dolmatov with a commemorative gift at the Belledune Port Authority's Administrative offices.

The Director of Marketing & Business Development at the BPA, Jenna MacDonald, presented the Tundra*'s Captain Sergiy Dolmatov with a commemorative gift at the BPA's Administrative offices.*

"Wood pellets fall within our forestry sector which is a very important sector to the port as it contributes to the development of the operation," said Denis Caron, President & CEO at the BPA. "The forestry sector is one of our five key sectors. The other four sectors include energy, agriculture, mining & minerals, and the modular sector."

In 2016 the port received a total of nine vessels that served the forestry sector. Within that same year, the port handled 226,304 metric tonnes of forestry cargo.

The *Tundra* is the first vessel of many which are expected to lay anchor at the Port of Belledune this year. Last year, the port played host to 97 vessels, which is 26 more than it received in 2015. The port also handled approximately 2,027,431 metric tonnes of bulk cargo, which is up 14% from the previous year.

"Here at the Port of Belledune we are focused and we are seeing results," said Caron. "We will continue our efforts to enhance our capabilities, create new opportunities and encourage new development at the Port and in Northern New Brunswick."

The Port of Belledune therefore finished 2016 on a high note, increasing its vessel traffic and tonnage handled — the first ship of the year marks the beginning of yet another new chapter for the port, which looks forward to the year ahead and to welcoming captains and their crews from around the world.

'Sunda': first vessel of 2017 to call at Trois-Rivières

The *Sunda* is the first ocean-going vessel from an overseas port to dock at the Port of Trois-Rivières in 2017. It reached the port on 8 January, at 6:51pm, following an 11-day non-stop Atlantic crossing. It left the Port of Bilbao in Spain on 28 December last year.

During the 51st ceremony marking the arrival of the first vessel of the year at the Port of Trois-Rivières, the captain and the ship's chief engineer, Ioannis Sevastou and Delfin Mendoza Do Chavez were presented with a giclée reproduction of the painting À bon port, by Mauricie artist Caroline St-Pierre.

Cléo Marchand, Chairman of the Board of the Trois-Rivières Port Authority (TRPA), explains that a few other vessels have docked at the Port since 1 January, but none qualified for the title. Indeed, it must be an ocean-going vessel that departs from an overseas port, makes a non-stop crossing to Trois-Rivières and performs an unloading operation at the port."

The 51st ceremony marking the arrival of the first vessel of the year at the Port of Trois-Rivières.

About the 'Sunda'

The *Sunda* flies the Liberian flag. It is operated by Seastar Shipmanagement and chartered by Canfornav Ltd. During its stay in Trois-Rivières, it is represented by the Lower St-Lawrence Ocean Agencies Ltd., while the cargo loading is handled by G3.

The *Sunda* and its twenty Greek and Filipino crew members came to Trois-Rivières to load Canadian grain. The ship remained moored in section 16 during its three-day call. Built in 2010, the bulk cargo vessel is 186 metres in length and 23.75 metres in width with a load capacity of 29,800 metric tonnes.

How do ships navigate in the winter?

Gaétan Boivin, president and CEO of the TRPA, notes: "The crews accomplish amazing feats by navigating on the St. Lawrence River in the winter, even though the ships are equipped for this." The ships have a reinforced hull, an adapted engine that heats the water used by its cooling system (to prevent ice build-up) and are equipped with high-performance navigation systems, like radar, to detect the presence of ice. They must also lighten their cargo.

About the Port of Trois-Rivières

The Port of Trois-Rivières is a rapidly expanding strategic port, open year round, providing tailored solutions for the transshipment of bulk products and general cargo.

The port also has excellent railway and road connections linking it to all the main North American networks and enabling it to reach one of the largest markets in the world. It plays an important role in regional national and international economic development.

Transshipments at the Port of Gdansk exceed 2015's record

The finalized figures for 2016 are not yet available, but the volume of transshipments is already higher than in the previous record year, being currently estimated at more than 36.3mt (million tonnes). This is a result which, until recently, would have been out of reach for any Polish port, but today it has become reality. It puts Gdansk in sixth place among Baltic Sea ports, its highest position so far. This is what is shown by recently published data on the Baltic ports, with a summary of the first 11 months of this year.

In spite of the rather difficult market conditions and the increasingly strong competition, this has turned out to be yet another year — now the sixth in a row — of continuous growth in commodity turnover at the Port of Gdansk. Apart from the new record and the move up in the ranking of the largest Baltic ports, it also brought a record tonnage of general cargo, which will have the highest percentage share in Gdansk's commodity turnover for the first time since time immemorial. For many years, the dominant role has been played by liquid fuels, of which the port will handle a slightly reduced quantity this year — about 13mt.

The year 2016 will doubtless also be remembered as yet another period of growth in container turnover, with an increase of 16% over 2015 and 5% more than in the record year of 2014. It is already clear that this increase will be even greater when the figures for the year are finalized.

The year has also been particularly good when it comes to coal transshipments. At the end of December last year, total coal throughput was just 100,000 tonnes short of 5mt. In practice, this will mean the highest tonnage of coal at Gdansk in a decade. To date, the record year in this respect was 2013, when the port handled 4.6mt of that material.

Figures for 2016 are also very good in terms of what is called other bulk cargo turnover. Before the complete summary of December, the result here is estimated at 3.6 million tonnes (including transshipments of ore) and is the third best result in the last ten years.

To sum up, just like 2015, 2016 will go down in the history of the Port of Gdansk as an incredibly successful year, not only in terms of commodity turnover and further consistent enhancement of Gdansk's position on the maritime map of Europe, but also as a year of investments, very important for the future of the port — both those that have been completed and those that are just starting.

Port of Sept-Îles hands out 30th cane to year's first ship

The *AM Krakow*, a Marshall Islands-registered vessel, sailing from Ghent, Belgium, was the first ship to arrive in Sept-Îles this year, at 3:50 a.m. on 1 January 2017. The vessel arrived empty and docked on 8 January at IOC Rio Tinto dock N° 2. It set sail again on 9 January with 78,580 tonnes of iron ore destined for Ghent, Belgium.

During a short ceremony, Pierre D. Gagnon, President & CEO of the Port of Sept-Îles, as well as Thierry Martel, Chief Operations Officer of IOC Rio Tinto and Maurice McClure, Vice President, Finance and Strategy, presented Captain Maini Ashish with the prestigious cane bearing the Port of Sept-Îles insignia.

This tradition, now in its 30th year, marks the arrival of the first ship of the year to call the port and highlights the importance of the maritime industry for the region's economic activity. To be eligible, the vessel must come directly from a foreign port and be bound for a destination outside the country without making any other calls at a Canadian Port.

About the Port of Sept-Îles

Boasting diverse, state-of-the-art facilities, the Port of Sept-Îles is one of North America's largest ore-handling ports, with an annual volume of close to 25 million tonnes. The port facilities at Sept-Îles play a vital and strategic role in the economy of Eastern Canada. Annual economic impacts are estimated at nearly $1 billion and almost 4,000 direct and indirect jobs.

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A Dutch reckoning?

Netherlands ports implement strategies to offset reduced coal throughput

Louise Dodds-Ely

Ovet turns to new markets to boost cargo volumes

OVET B.V. is a renowned stevedore which operates in the ports of Terneuzen and Vlissingen in the Netherlands, where it handles a wide range of bulk cargo. As well as all manner of black goods — including coal, petroleum coke, coke, anthracite and brown coal (lignite), OVET handles a multitude of non-black goods, and is always on the lookout for new challenges and opportunities. It is this flexibility and forward-looking approach that will ensure that it thrives despite the recent fall in the throughput of coal.

OVET is equipped to handle any type of dry bulk product, and holds all the appropriate licences for a vast range of products. OVET not only offers open air storage, but also has suitable storage facilities for products that must remain dry, such as biomass and other types of dry bulk products. These products can be stored in its covered storage facilities.

In a nutshell, OVET is a bulk storage company with long-standing experience in the storage and transshipping of black and non-black goods.

OVET has four floating cranes, giving it the flexibility to operate at both of its terminals in Terneuzen and Vlissingen as well as on the river Scheldt and even in Ghent and Antwerp.

Winds of change

The table to the right indicates how cargo throughput has changed in the last year, reflecting the reduction in the amount of coal being shipped in Europe. OVET expects throughput in the next year to continue along the same lines. The percentage taken up by 'other' products, like agribulk and biomass, is expected to increase, while steam coal is expected to fall further.

Since OVET was founded in 1957, coal has been the main product handled at its terminals. However, as the market share of coal in Europe is decreasing, OVET faces many changes in the

OVET THROUGHPUT AT TERNEUZEN & VLISSINGEN

Products	2015	2016
Steam coal	36%	16%
Coking coal	34%	37%
Iron ore	11%	14%
Petcoke	7%	7%
Anthracite	2%	2%
Coke	4%	8%
Other products	4%	10%
Agribulk	1%	5%
Biomass	2%	2%

Amsterdam transshipment grows to 78.8mt

Transshipment at North Sea Canal Ports unchanged at 96.5 million tonnes in 2016

Transshipment in the sea ports of the North Sea Canal Area, which includes the ports of Amsterdam, IJmuiden, Beverwijk and Zaanstad, was unchanged in 2016 compared to 2015 at 96.5mt (million tonnes). According to provisional figures, Port of Amsterdam achieved an increase of 0.4% to 78.8mt last year, compared with 78.4mt in 2015. Finalized figures will be available from the port very shortly.

At IJmuiden, transhipment fell 3.4% to 16.8mt. Beverwijk saw its transshipment increase to 700,000 tonnes (+133%), while there was a decline in Zaanstad to approximately 200,000 tonnes (–33%).

Increase in liquid bulk cargo

The increase in Amsterdam was mainly due to a 5.8% rise in the transshipment of liquid bulk cargo products to 45.3mt. Petrol and diesel products were up 7.5% at 42.4mt.

Dry bulk throughput

Transhipment of coal at 7.5% showed less of a decline compared with the previous year, falling to 16.1mt. Transshipment of agribulk also declined by 14% to 6.4mt. Other dry bulk, including ores and fertilizers, was up 5% to 8.4mt.

Containers stay the same

The transhipment of containers was unchanged on the previous year at 600,000 tonnes in 2016 (TEU 51,475). Ro/Ro, cars and other mixed cargo declined by 14% in 2016 from 2.1mt to 1.9mt.

Land allocation

On balance, 11 hectares of land were allocated to businesses in 2016. Port of Amsterdam thus achieved its target.

Imports and exports

Imports at the Port of Amsterdam were down 3% to 63.1mt last year. Exports on the other hand were up by 7.9% at 33.4mt.

Cruise calls

A total of 122 cruise ships visited Amsterdam in 2016 (2015: 139), though passenger numbers remained mainly the same. The number of river cruise calls rose again, by 6% to 1,876.

CEO statement

Koen Overtoom, CEO of Port of Amsterdam: "The transhipment of oil products rose again, and we expect this to continue in the coming years. We remain fully committed to further strengthening the position of the Port of Amsterdam so that we continue to be the port of choice for customers and users. We will also continue our commitment to diversification into circular industry, off-shore, large-scale logistics and manufacturing."

About Port of Amsterdam

Port of Amsterdam is Western Europe's fourth-largest port and plays a large role in the transshipment and processing of energy products. The North Sea Canal Area transshipped approximately 96.5mt of goods in 2016, with Port of Amsterdam accounting for approximately 79mt of this amount. A total of 68,000 people work in the port region either at companies in the port or at port-related companies. Approximately 34,000 of these work in Amsterdam. Port of Amsterdam is committed to being a smart port and to adding value for customers and the environment in a sustainable and innovative manner. It seeks to promote growth at companies, while still taking a careful approach to the available space and the quality of water, soil and air. Port of Amsterdam works as port of partnerships intensively with partners in the business community (national and international), city and region.

supply of dry bulk cargo.

In Terneuzen, OVET was founded as a local transshipping company for the coke factory in Sluiskil. Nevertheless, when the factory closed its doors in 1999, OVET had already expanded its business, finding new clients with a diversity of products which gave OVET new reasons for existence.

Now OVET needs to deal with a similar situation at its terminal in Vlissingen. As the adjacent coal power plant EPZ was forced to shut down at the end of 2015, again diversification in products will be the key to survival. New products require new ways of transshipment and also new ways of storage. Therefore, OVET not only offers the standard open storage possibilities, but also covered storage in separated compartments, fully ventilated and GMP-certified.

Besides all these external changes, OVET also faces a big internal modification, as its managing director Johan Martin retired at the end of January 2016. Therefore, its new managing director Vincent Courtois faces some challenges in this changed market situation, which also creates great opportunities to go in new directions. In short: OVET faces a wind of change.

How a 'black' terminal can perfectly handle other products: even agribulk

As national governments in Western Europe are closing more

and more coal-fired power stations in order to fulfil the demands of the European Union concerning CO_2 emissions, dry bulk terminals need to fill the gap that has been left by the 'black gold'.

Diversification is the key word, but is that possible? In other words, can a 'coal' terminal be GMP-certified, transship and even store other products such as agribulk and biomass in a clean and safe way? The answer is yes! OVET, known as a dry bulk terminal located in the ARA (Antwerp–Rotterdam–Amsterdam) range with terminals in Vlissingen and Terneuzen, has already proven that it's possible. Originally founded as a coal terminal to supply coal to coke plants and coal-fired power stations, nowadays OVET is specialized in handling all kinds of cargoes. To avoid any kind of contamination and to deliver the best performance in transshipment, OVET treats every cargo in accordance to its specific needs.

As other dry bulk terminals based their strategy and equipment in the past upon the big bulk of coal, OVET has chosen to stay a terminal not just suitable for the big bulk of coal, but also for smaller quantities of special bulk products. In fact, OVET always had the strategy of diversification, but recent years more than ever.

At the open storage space of approximately 48ha, OVET stores different products strictly separated, without causing any contamination. This can only be done by keeping the terminal neat and by handling and storing the various products carefully and with respect to its characteristics.

Besides open storage, OVET offers also covered storage with separate compartments which are fully ventilated. This covered storage is GMP plus-certified and has the exact building specifications to store agribulk and biomass products in a perfect way. To avoid any possible contamination with 'black' products, the covered storage facilities are located at a separate part of the terminal, near a dedicated quay used only for these type of products.

As the demand for storing agribulk is increasing, OVET will extend the possibilities for covered storage by building a new shed. This will double the capacity for covered storage and enable OVET to intensify its strategy of diversification. Moreover, the fact that OVET knows well how to handle agribulk and biomass has already been proven by the many direct transshipments and even lightering operations that OVET has carried out handling these products.

So it is certainly possible to fill the 'black' gap with other products such as agribulk and biomass, but only by handling and storing these goods in a correct way and by adapting the terminal's equipment to the needs of the different products.

Other services

OVET also offers a range of other services, including expedition activities (chartering sea vessels and barges), storage facilities in the hinterland and organizing transports by train and truck to the hinterland.

Terminal Terneuzen (Massagoedharbour)

With its floating cranes, OVET is active throughout the entire area of the Western Scheldt, in Vlissingen, Terneuzen and Ghent, but also at anchorage berths on the Western Scheldt itself.

Terneuzen statistics

Maximum vessel size	Panamax: up to 90,000dwt
Maximum LOA:	265m
Maximum beam:	37m
Maximum draught:	12.50m fresh water

Storage	
Capacity:	600,000 tonness open storage
Paved terrain:	160,000m^2
Quay length:	1,400 m

Terminal Vlissingen (Kalootharbour)

Vlissingen statistics

Maximum vessel size:	Capesize: up to 180,000dwt
Maximum LOA:	310m
Maximum draught:	16.50m salt water

No locks = no risks

Storage

Capacity:	1,500,000 tonnes open storage
Covered storage:	45,000m³
Paved terrain:	300,000m²
Quay length:	1,000 m

Rail

Maximum train capacity:	2,500 t
Maximum train length:	700m
Track length:	1,200m
Track length double:	650m

Covered storage

Number of compartments:	6
Surface area per compartment:	1,000m²
Capacity per compartment:	7,500m³
Storage capacity warehouse:	45,000m³

OVET for lightering vessels on the Scheldt

About 100 vessels are lightered on the Western Scheldt every year, at the anchorage berths Terneuzen and Everingen Rede. The lightered vessels have Terneuzen, Ghent or Antwerp as their destination.

Capacity:	up to 20,000 tonnes per tide
Maximum draught:	16.50m (salt water)

Hinterland connections for the perfect access by rail, road or water transport

Rail transport

Since July 2013, OVET has had a completely renovated track and a new train loading system at the Vlissingen terminal. This ensures that OVET is able to provide an even better hinterland connection for its customers. OVET has successfully proven that a train can travel to and from the German Ruhr area within 24 hours. On top of that, both dry bulk terminals have a good connection to the European railway network with good access to the Betuwelijn and the Corridor C.

The length of the rail track is 1,200 metres, of which 650 metres is double track. This train loader enables OVET to load a train of circa 44 carriages (2,700 tonnes) at a speed of 1,500 tonnes per hour. It is equipped with an antifreeze installation, an iron-removal magnet and an automatic weighing system (accurate to the kilogram).

Road transport

OVET uses loaders to fill up trucks, which then pass a weighing platform to determine the exact weight.

Water transport (inland navigation/maritime shipping)

The OVET dry bulk terminals are connected to the most important waterways in Europe. Access to the Rhine in Germany is gained through modern channel connections. The proximity of the North Sea ensures that the OVET dry bulk terminals are very suitable for sea traffic. OVET is able to load and unload all inland navigation (lighters and tug-pushed barges) and maritime shipping (Coasters, Handysize, Panamax and Capesize). All possibilities are therefore open for its customers.

Future developments

As part of its efforts to handle different products, this year OVET will extend its covered shed at the Vlissingen terminal, which will increase its abilities to handle cargoes such as agribulk.

Damen fleet expansion continues at Fratelli Neri

Italian towing company Fratelli Neri S.p.A. has expanded its fleet with the delivery of three new Damen workboats. The trio of vessels will be based in the company's home port of Livorno, on the Tuscan coast. Damen delivered all the vessels from stock; completing the final outfitting works within a timescale of three and a half months.

This current delivery to Fratelli Neri consists of three different vessels. The first, an ASD 2913, was built at Damen Shipyards Galati. This vessel sailed from Romania to Italy on her own keel. The other two vessels – a Stan Launch 1305 and a Stan Tug 1606 – were being held on stock at Damen Shipyards Gorinchem in the Netherlands. Damen transported these two workboats to Livorno on a heavy-lift vessel.

The ASD 2913 Toscana.

Different vessels, different jobs

For its harbour assistance duties in Livorno port, the ASD 2913, called *Toscana*, has seen a number of modifications. These include the installation of FiFi1, oil recovery capability and an aft winch all in line with Italian flag regulations.

Fratelli Neri will mobilize the Stan Tug 1606, called *Pacini*, on shallow water operations in coastal and inland waters around Livorno. For such duties, this compact and sturdy Stan Tug design is an ideal match. As well as fire-fighting apparatus, the Italian-flagged *Pacini* is also equipped with an aft towing winch.

The Stan Launch 1305 was delivered to Labromare S.r.l.; one of Fratelli Neri's subsidiary companies. Labromare, which is 50% owned by Tripmare S.p.A., offers waste management and anti-pollution services to ports. The vessel, called *Santa Giulia*, will perform a range of environmental services in the region.

The Stan Tug 1606 Pacini.

Six in just over one year

With the sales contract between Damen and Fratelli Neri signed at the end of July 2016, this is another example of how Damen prides itself on meeting customers' tight delivery schedules. "This was certainly a challenging timeframe to work in, we knew it from the moment the contract was signed and required strong combined efforts at our building yards. Achieving the delivery dates on time was possible due to the great cooperation with Fratelli Neri – whose staff were all very helpful and pleasant to work with," comments Andrea Trevisan, Damen Sales Manager North, West and South Europe.

"We are very happy that Fratelli Neri have taken a further three Damen vessels to operate in beautiful Tuscany and we are happy to continue our cooperation with this prestigious Italian family-owned company hoping to serve Fratelli Neri again in the future ."

This three-vessel order brings the number of Damen vessels that the family-owned Fratelli Neri has purchased within a bit more than one year to six. Mid-2015, the company acquired two Stan Tugs 2608 from Damen Trading and also took delivery of a new ASD 3212 Tug which was named *Luisa Neri*.

Damen Shipyards Group

Damen Shipyards Group, headquartered in the Netherlands, operates 32 shipbuilding and repair yards, employing 9,000 people worldwide. Damen has delivered more than 6,000 vessels in more than 100 countries and delivers some 180 vessels annually to customers worldwide. Based on its unique, standardized ship-design concept Damen is able to guarantee consistent quality.

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

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

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 16 repair and conversion yards with dry docks ranging up to 420 x 80 metres. Conversion projects range from adapting vessels to today's requirements and regulations to the complete conversion of large offshore structures. DSC completes around 1,500 repair and maintenance jobs annually.

The Stan Launch 1305 Santa Giulia.

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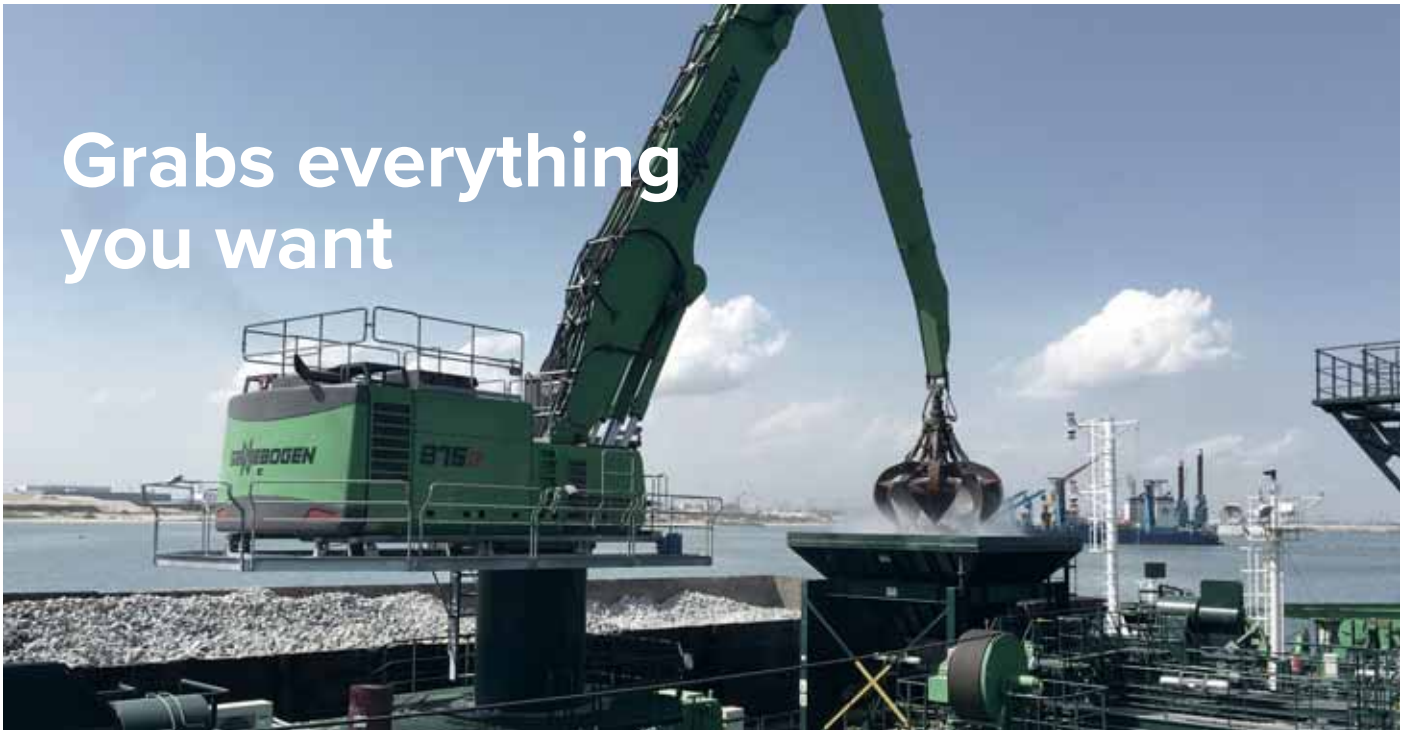

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We grab everything you want!

Zeeland Seaports: flexible, streamlined and efficient

Zeeland Seaports — the ports of Vlissingen (Flushing) and Terneuzen in the Netherlands — offers many advantages when it comes to handling various types of cargo: its location on the open sea; a draught of 16.5 metres; the congestion-free hinterland connections; and its specialized terminals. It also boasts a highly professional staff — of around 80 — who take pride in their work and their ports.

Zeeland Seaports offers excellent access from the North Sea. Also it has congestion-free links to the hinterland by rail, road, inland waterway, shortsea shipping and pipeline.

Zeeland Seaports is responsible for the sustainable development of logistics and industry in the Zeeland seaports in a dedicated and respectful manner. The company's core values are reliability, focus on results, co-operation, respect and dedication.

Zeeland Seaports handles a wide variety of cargoes, including: dry bulk, breakbulk, ro/ro cargoes, liquid bulk, and containerized cargoes. It is also very active in the offshore and food sectors.

Dry bulk

Zeeland Seaports offers an excellent service in the handling of dry bulk commodities. This includes spacious: docks with direct access to the open sea; stevedores and storage companies specializing in specific cargo flows such as coal, raw minerals and fertilizers; and rapid transport connections with the hinterland by rail, motorway and inland shipping.

New boosts

Work is also constantly under way, with the aim of optimizing accessibility and infrastructure. The opening of the Kaloothaven means that dry bulk carriers with a draught of up to 16.5 metres can access Vlissingen. A new loading station is a real boost for the rail connection to the German hinterland. The arrival of the Sluiskil Tunnel will speed up road traffic heading south.

Possibilities for growth

The storage of dry bulk generally requires a lot of space. Zeeland Seaports has this space. It also has the capability to guide the growth or establishment of production and stevedoring companies along short lines. All of this makes dry bulk and Zeeland Seaports a trusted combination with a future.

Terminals dedicated to dry bulk

- Ovet B.V.;
- Verbrugge Terminals B.V.; and
- Sagro.

Breakbulk

Breakbulk plays a key role in commercial activity within the Zeeland ports. Zeeland Seaports offers the flexibility to process a wide range of breakbulk cargo quickly, efficiently and at optimum costs. This is due not only to unhindered access from the sea and a trimodal connection to the hinterland, but definitely also due to the presence of specialist logistics service providers. Zeeland Seaports offers the flexibility to process a wide range of breakbulk cargo quickly, efficiently and at optimum costs. This is not only thanks to unhindered access from the sea and a trimodal connection to the hinterland, but definitely also due to the presence of specialist logistics service providers.

Strong clusters

Within Europe, Zeeland Seaports has earned a leading role as a storage and handling location for wood pulp and aluminium, for example. Partly as a result of this, the clusters forest products and metals are very well represented in the Zeeland ports. These clusters are only growing stronger because companies in the port dare to invest in expanding and modernizing their capacity.

Room for growth

Zeeland Seaports sees opportunities for growth when it comes to breakbulk. The leading role it already occupies in a number of market sectors serves as an example of how the Zeeland port can grow further in the storage and handling of other types of cargo, such as metals.

The developments in world trade and the changing logistical concepts demand more space in seaports. This also applies to a seaport that has efficient access by inland shipping, coastal shipping, rail and road transport. Zeeland Seaports can offer this space and these distribution possibilities. Furthermore, the shipping companies benefit from Zeeland's central location and the shorter sailing times.

Terminals dedicated to breakbulk:

- Mammoet Multipurpose Terminal Terneuzen;
- Pacorini Metals Vlissingen;
- Supermaritime Nederland;
- Verbrugge Terminals; and

❖ BOW Terminal.

Containers

Goods are increasingly being transported by container throughout the world. This growth is also expected to continue into the future. Naturally, Zeeland Seaports is responding to this trend. There are already container-handling facilities in the port. Thanks partly to the good connections by inland shipping, rail, short sea shipping and road, containers quickly find their way to the hinterland.

In the coming years, the facilities for handling containers in the Zeeland ports will expand considerably. Zeeland Seaports has plans for the arrival of modern, specialized container terminals, among other things. That offers plenty of opportunities for shipping companies, carriers, receivers and many other parties in the logistical chain to share in this growth.

Central location

Vlissingen is close to international sailing routes for container transport. The port lends itself very well to the import and export of containers without any form of congestion. It is logical, therefore, that Zeeland Seaports aims to grow into an important player in Northwest Europe when it comes to containers.

Offshore

Within the offshore market, Zeeland Seaports has been a reliable and sizeable player for many years, thanks to its strategic location *vis-à-vis* many offshore oil and gas rigs and wind farms in the North Sea, and also thanks to the excellent nautical access for installation vessels: no locks and hardly any waiting times. And all of this is combined with excellent access via inland shipping.

Industry

More than 250 logistics and industrial businesses together form the Zeeland ports. What spearheads Zeeland Seaports is the idea that companies can benefit from each other's strengths as much as possible. One way in which this occurs is through the formation of clusters. Valuepark Terneuzen, a successful cluster of companies in the chemical industry, has already been a good example of this for ten years.

ENIGMA+ streamlines operations

The recently introduced cross-border port information system ENIGMA+ system is working well for the Port of Ghent and Zeeland Seaports. Since the beginning of 2015, vessels as well as companies only have to use one single cross-border port information system for all arrivals at and departures from the ports of Ghent and Terneuzen. Until 2015 the Flemish port of Ghent and the Dutch Zeeland Seaports each had their own port information system. For vessels that had to sail on the Ghent–Terneuzen Canal, all vessel and maritime information had to be entered into two port information systems. In order to have this done in a more efficient way, the ports decided to jointly offer one single port information system. Ghent's ENIGMA (Electronic Network for Information in the Ghent Maritime Area) system was extended in order to meet the needs of Zeeland Seaports. For example, it can also be linked to the Port Base port information system that is used by different Dutch ports.

ENIGMA+ for maritime information and service rendering

The extended port information system ENIGMA+ (Electronic Network for Information in the Ghent–Zeeland Maritime Area) comprises among other things the follow-up of arrivals and departures, vessel berths in both ports and a view of the vessels that are on their way. ENIGMA+ is also linked with information systems of other maritime service providers. Moreover, it is also a communication platform for the various port users for ordering services like dockworkers for the loading and unloading of ships, boatmen for fastening ships and for tugs. Users can safely and smoothly log on to the system from around the world.

Unique cooperation: cross-border shipping assistance

One single and joint port information system for two ports situated along the border between Flanders and the Netherlands forms part of the unique cooperation between the ports of Ghent and Zeeland Seaports. In this way, the ports are already preparing themselves for the taking into use in 2021 of the larger new lock in the lock complex of the Dutch port of Terneuzen.

Ghent-Terneuzen Canal: one border-crossing economic area

The Flemish port of Ghent and the Dutch Zeeland Seaports are situated at the Ghent–Terneuzen Canal. This border-crossing economic zone is good for 60 million tonnes of cargo traffic by seagoing vessels, with which the ports together would from the seventh biggest port in Western Europe. The 32km-long canal (17km in the Netherlands and 15km in Flanders) represents 100,000 jobs, 425 companies and 80,000 inhabitants. The canal is not only important as gateway to both seaports but it also forms a major link in the European network of inland navigation

Fertilizer giant Yara is a major user of Zeeland Seaports.

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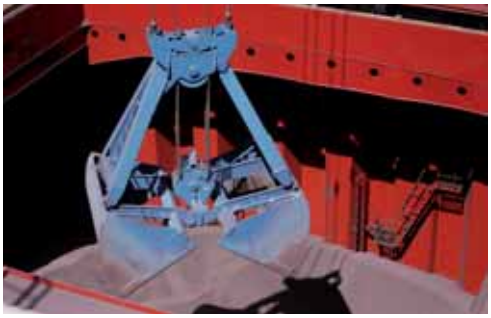

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Rotterdam Bulk Terminal: a traditional approach

Rotterdam Bulk Terminal operates as one of the most traditional bulk terminal facilities in the Port of Rotterdam, located at the Northbank of the river New Maas. The focus of Rotterdam Bulk Terminal is on the handling and storage of bulk commodities such as dry minerals, coal, agri- and biomass. Rotterdam Bulk Terminal is indeed a multi-purpose bulk terminal. The lay-out of the terminal, combined with the type of gantry-cranes, allows for the handling of a great variety of bulk products. Amongst these are coal, cokes, salt, china clay and fertilizers. In addition dry minerals are handled and stored such as bauxite, magnesite and bentonite.

Equipment

Cranes

Rotterdam Bulk Terminal is equipped with two gantry cranes. The lift capacity of the cranes is 16 metric tonnes. With a total span of 160m, the cranes can be used for board-board handling with vessels up to Panamax size, as well as for terminal unloading. Depending on the type of product and the handling method (board-board or terminal discharge), the average production per crane per hour amounts to 350–500tph (metric tonnes per hour).

In addition to the gantry-cranes, Rotterdam Bulk Terminal has access to a fleet of floating grab cranes for board-board handling.

Conveyor-belt system

A fixed 1,500m conveyor-belt system is part of Rotterdam Bulk Terminal's infrastructure to feed the six steel silos as well as the shed. Delivery of products from these storage accommodations runs through the same belt-system to the loading jetty (portnumber 602) at the southside of the terminal. The barge/coaster loader at the jetty has a capacity of approximately 500tph. The draught at the jetty is 6.00m.

For various bulk handling operations at the terminal and inside the holds of vessels, Rotterdam Bulk Terminal operates a fleet of front-end and shrankloaders.

Full-service stevedoring from Maja Stuwadoors

Maja Stuwadoors is a stevedoring company headquartered in Amsterdam. The family business has been operating since 1972, and it offers services to customers in the major sea ports in the Netherlands.

Maja has a team of 35 well-trained and motivated employees.

Storage

Maja offers specific storage for each type of material. To preserve quality and safeguard safety, it is essential to have the appropriate storage facilities for each type of material. This applies to the storage of fertilizers, minerals, agricultural products and biomass.

Storage sheds

Maja has two storage sheds for the storage of bulk and/or mixed cargo, with four compartments in total, each measuring 3,750m^2. Each compartment can hold 10,000 to 15,000 tonnes. Specific services such as temperature and CO_2 content measurement for agricultural and biomass products can be tailored to the customer's requirements. The water depth at storage is 9.6m. The quay is 400 metres long and is especially suited for Handysize bulk vessels with a 28,000–30,000dwt.

Maja ensures that all goods are stored under the best possible conditions. It offers weighing facilities on location. There are several options that include sub-dividing the shed into smaller compartments and other customizations. Maja applies different protocols for the storage of bulk agricultural goods, minerals, fertilizer and biomass and/or mixed cargo.

Transshipment

Fast and efficient

Maya is specializes in the transshipment of bulk, but it also has plenty of experience with mixed cargo. Handling customers' goods quickly and efficiently is key. Maja has its own docks, floating and fixed loading and unloading cranes and other machinery and equipment, and experienced staff who can expertly deal with all cargoes. The company's flexibility allows it to respond quickly to any of its customers' requirements.

Bulk

Maja has been loading scrap for bulk carriers for years. It stands out by carrying out transshipments as damage-free as possible. In addition, it also works fast. Fertilizer is a unique product that has specific loading and unloading requirements, and Maja has extensive experience in this respect. It ensures closed grabs are used and unloads as accurately as possible to minimize spillage. Maja also transships minerals such as talc, dolomite and bentonite in large volumes, during which preventing damage and spillage plays a major role. Maja has a number of required permits for the storage of various types of bulk materials. It applies strict protocols for the storage, maintenance and cleaning of equipment, ensuring substances are never mixed. It also takes care of the transshipment and storage of agricultural products and minerals for animal consumption and is GMP-certified. Maja is at home in the market for the transshipment of coal and the storage and transshipment of biomass (e.g. wood pellets).

Mixed cargo

Maja knows all there is to know about the transshipment of mixed cargo, such as big bags, steel (including coils), paper, project cargo and so on. With its diverse fleet of self-propelled floating cranes and its experienced staff, here, too, it guarantees the quick and efficient loading and unloading of goods.

Maja is also able to process large items up to a maximum of 140 tonnes with its Liebherr LHM 550 crane, located in the Vlothaven terminal in Amsterdam. Maja is able to help customers looking for the storage or transshipment of heavier cargo at the Vlothaven in Amsterdam.

Rental

Maja rents out cranes for specific projects or lifting operations on an hourly basis. It encourages any customers with a particular lifting job that requires a floating crane to get in touch to discuss options.

Activities abroad

Maja rents out floating cranes with crew for unloading vessels and for projects abroad. It currently has several floating cranes operational abroad. Projects or solutions often have a long-term character. Operations may take place off the coast or in a port, depending on the weather, since the current and wave height must allow unloading.

Current projects include:

- **loading bauxite for China:** in the Caribbean Sea, Maja carries out transshipment operations for a bauxite mine in the Dominican Republic. The bulk carriers are loaded at the Dominican coast due to lack of port facilities for larger vessels with deeper draughts. The bauxite is loaded to barges at the coast, and the barges sail from the load location at sea to the bauxite storage facility. Maja loads Capesize bulk carriers from 120,000 to 180,000dwt with a 25-tonne floating lemniscates crane. On an annual basis, Maja transships approximately 2mt (million tonnes) of bauxite for the mine.
- **loading scrap using quay cranes and floating cranes:** Maja loads and unloads scrap for various companies. In Amsterdam, Maja is a specialist in the loading of scrap metal on to bulk carriers. It does this using both quay cranes and floating cranes, shipping from the shore and from vessels. Unloading must be done very carefully because of the risk of falling scrap and the possibility of damage. Loading must also be done carefully and includes measuring the radioactivity of the scrap.

Maja takes care of everything

Maja can provide its customers with barges and cargo storage space. It has been taking care of the storage and transshipment of bulk minerals for customers in the ports of Amsterdam and Rotterdam for many years. Maja works together with reliable suppliers of barges and tugs, allowing it to provide a fully customized service. Controlling this aspect of the supply chain means the customer can relax, and it also enables Maja to carry out all unloading operations smoothly without intermediaries.

EECV: major link in the metallurgical logistics chain

On behalf of its shareholders, thyssenkrupp Steel Europe AG and Hüttenwerke Krupp Mannesmann GmbH, Ertsoverslagbedrijf Europoort C.V. (EECV) operates one of Europe's largest and most modern bulk cargo transshipment facilities in the Europoort area of the port of Rotterdam. EECV operates a state-of-the-art terminal, one of the largest and most advanced in Europe.

On an area of more than 100 hectares, the terminal handles around 28mt (million tonnes) of iron ore and coal each year. Using ecologically friendly and up-to-date technologies EECV unloads seagoing vessels, stores and loads raw materials into push barges and barges for onward transport to German customers in the Ruhr area.

Ever since the deep-water harbour was opened in 1967, ships with tonnages of up to 365,000dwt have been unloaded around

the clock using state-of-the-art technology bringing in around 20mt a year of overseas iron ore and additives for use in steelmaking.

On a site covering an area of 47ha, up to 3.0mt of ore can be temporarily stored. EECV not only transships ores for the German steel producers situated at the Rhine and Ruhr-area, but also manages their largest stock of raw materials.

By just-in-time loading of the required quantities and types of iron ore into pushed barges, transported in groups of four to six units up the Rhine to Duisburg, EECV forms a vital link in the overall logistics chain by ensuring that supplies to steelworks are maintained.

Since 2003, thyssenkrupp Steel Europe AG and Hüttenwerke Krupp Mannesmann GmbH have also been supplied with coal via EECV to provide their blast furnaces and the coking plants that supply them. To enable this, a new terminal was constructed at a site adjacent to the EECV ore terminal, for the transshipment up to 8mt of coal. As the operations manager of this facility, which is equipped with the latest environmental protection technologies, EECV is responsible for unloading seagoing vessels, managing the stockyard and loading coal on to barges and trains.

EECV TERMINAL HANDLES ITS BILLIONTH TONNE

On the evening of Monday, 12 December 2016, EECV (Ertsoverslagbedrijf Europoort c.v.) recorded its billionth tonne of dry bulk put through at the company's sea quay in Rotterdam.

As well as its activities focusing on the transshipment of ore and coal, EECV served as the home base for the *Berge Stahl,* the

STATISTICS: EECV ORE AND COAL TERMINALS

Ore Terminal

Financial year	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
Seavessels	116	126	128	126	124
Total unloaded*	19.7	20.2	20.7	18.9	19.6
Barges	10.322	8.972	8.834	8.492	8.833
Total loaded*	20.9	20.6	20.4	18.9	19.6
Total treated*	40.6	40.8	41.1	37.8	39.2
Total unloaded since 1970*	854.7	874.9	895.7	914.6	934.2

Coal Terminal

Financial year	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
Seavessels	40	46	58	66	67
Total unloaded*	4.2	4.7	6.1	7.1	7.4
Barges	1.690	1.710	2.096	2.854	3.119
Coal Train	246	275	331	338	348
Total loaded*	4.2	4.7	5.7	7.1	7.7
Total treated*	8.4	9.4	11.8	14.2	15.1
Total unloaded since 1970*	34.3	39	45.1	52.2	59.6

** million tonnes*

ship that made its last call at the Port of Rotterdam in the middle of December last year, and that has transported close to 90 million tonnes of iron ore during its service.

thyssenkrupp Veerhaven

Most of the cargo unloaded at EECV is then forwarded to its destination by inland shipping. This is handled by the Brielle-based push towing company thyssenkrupp Veerhaven. Every day, the firm transports 60,000 to 80,000 tonnes of ore, coal and steel products to Duisburg, Germany. This is mainly done with the aid of six-unit pusher combinations.

Rail transport also deserves a mention: EECV operates a wagon loader that can automatically load trains with up to 44 cars.

Bulk throughput in Rotterdam

In 2015, the throughput of dry bulk in Rotterdam totalled 80mt (million tonnes). This breaks down into 34mt of iron ore/scrap, 23mt of coal, 11mt of agribulk and 12mt of other dry bulk. In 2015, the EECV facility handled 27mt. Together with the EMO terminal, EECV is Rotterdam's most important terminal for the throughput of dry bulk.

Organization

With reliability, flexibility and efficiency, EECV's 320 employees — about 70% of them work in shifts — guarantee the continuous and efficient transshipment of ores and coal around the clock.

As a team-oriented organization, EECV's planning, production

and maintenance personnel work to ensure that operations are smooth, from the unloading of ships to the loading of raw materials on to barges and trains.

Ore Terminal

The 1.1km-long sea quay offers berthing facilities for three ships. Thanks to its favourable location, with direct access to the North Sea and a depth of 18.5m to 23.7m, even the world's largest bulk ore carriers with tonnages of up to 365,000dwt can be unloaded at EECV.

Many ships have a shuttle service between Rotterdam and the main suppliers of raw materials, such as Brazil, Canada and Australia. Using four colossal grab cranes, which can each pick up 30 to 40 tonnes at a time, the various iron ores (pieces of ore, pellets, fine ore and concentrate) are unloaded and

transported via conveyor belts to the storage site.

Before stacker-reclaimers stack the ore according to its specification, the weight of the cargo is determined by using belt scales and representative samples are taken by fully automated sampling equipment. Up to 3.0mt and more than 30 different types of ore can be stored at several storage locations for EECV's steel making customers.

EECV is connected to a complex raw material planning system that controls the requested delivery of ores to Duisburg. The system ensures that specified ore types are reclaimed from the stockyard at the appropriate times and loaded on to barges and inland vessels on the 900m-long Dintelhaven inland quay. In units of four to six barges, the ores commence the final leg of their long journey, culminating in their use in the blast furnaces of Duisburg.

In recent years, EECV has stepped up its investment in the development and modernization of its operating processes, and is today capable of performing all activities semi automatically or fully automatically.

Coal Terminal

In the early years of its existence EECV only handled iron ore, but in 2003 it also started to handle coal shipments. In 2013, this operation was even expanded and nowadays EECV can handle approximately 8mt of coal per annum.

More than 15 different types of coal can be stored, up to a capacity of 1.3 mt. Besides the loading of coal into barges, EECV also have the possibility to load trains with 44 wagons, for which the system is fully automated.

Quality Management

Customer satisfaction, effective and efficient operation, continuous improvement of all services, workplace safety and environmental protection are all fundamental to EECV's quality management system. As a specialist in ore and coal transhipment, EECV is certified according to international standards like ISPS (the International Ship and Port Facility Security Code) and the BLU Code (Bulk Loading and Unloading Code).

Developments at the Port of Rotterdam

In common with other European ports, the Port of Rotterdam has been adversely affected by the reduction in coal volumes throughout Europe. Based on January to September figures, the port estimates a throughput of around 81.2mt (million tonnes) of dry bulk this year, which would be a drop of 7% compared to the 2015 result. For this year (2017), the port expects to see a modest growth of 1% to 82mt.

Agribulk

Agribulk throughput, mostly imports of grain (wheat, corn), soybeans and soymeal, is quite steady around 11mt per annum. Fluctuations in throughput are dependent on crop results and prices for domestic vs imported agricultural goods.

Production at the Abengoa biorefinery (with an annual capacity of 480 million litres ethanol for fuel use, and 360,000 tonnes of dried distilled grain) was halted due to financial problems with the parent company; however the refinery was taken over by the Alco Group. The temporary shutdown had a minor impact on the volume of feedstock (corn) used during 2016.

Iron ore & scrap

Throughput of iron ore was below the level of 2015. One of the reasons is the high level of steel imports into the EU. Although European demand for steel shows a modest increase, this is almost completely covered by imports from third countries (especially China). In the Port of Rotterdam's major market Germany, blast furnace iron production in the first nine months of last year was 2.1% below 2015. Also, refurbishing of blast furnaces in Saarland and Austria had an impact on the demand for iron ore.

The Port of Rotterdam did see an increase in scrap exports to Turkey, thanks to anti-dumping measures against Chinese steel.

DRY BULK THROUGHPUT AT ROTTERDAM

	2015	2016*	2017**	15–16	16–17
Agribulk	10,834	11,000	11,000	2%	0%
Iron ore & scrap	33,865	30,500	31,000	–10%	2%
Coal	30,691	27,500	26,500	–10%	–4%
Other	12,349	12,250	13,500	–1%	10%
Total	87,739	81,250	82,000	–7%	1%

Source: Port of Rotterdam Authority, 1,000 metric tonnes

** estimate ** forecast*

Coal

Two coal fired power stations were closed at the end of 2015, RWE Amer8 in Geertruidenburg and Engie in Nijmegen). On the other hand, two new coal plants from Uniper and Engie, started up at the Maasvlakte Rotterdam. Most of the coal arriving in Rotterdam is transported onwards to coal stations in Germany. The mild winter at the start of the year and good conditions for wind and solar, and the continuing increase of renewable energy had an impact on coal demand. Still, steam coal imports in Germany showed an increase (+3.8% in the first eight months of the year), because coal power remained competitive to gas during the year. However, because of very high coal stocks in Rotterdam (and other ARA [Amsterdam–Rotterdam–Antwerp] ports) coal plants were for a large part supplied with coal already stored at the coal terminals. Thus coal arrivals in Rotterdam remained behind the previous year.

Other dry bulk

The volume of other dry bulk handled in the port was just one percent below 2015. Other dry bulk consists of a broad range

Coal handling at the EMO terminal.

Grain silos at the European Bulk Services (EBS) Europoort site.

of commodities, from industrial minerals to sand and gravel. In general the throughput of other dry bulk is linked to the development of industrial production and construction activities in the port area and the hinterland of the port.

European Bulk services (part of the HES Group) expanded its covered storage capacity in the Botlek terminal. Supported by a long term contract for the storage of salt, the capacity will be enlarged by 60,000m³. The expansion involves the construction of a shed for various dry bulk products that need to be stored in covered storage.

Trends and opportunities

Dry bulk shipping and trade is going through a difficult period. European ports handling dry bulk commodities are experiencing a decline in demand in major markets like power and steel production, and the impact of climate policies on the demand for fossil fuels. Although in the short term a cold winter or successful anti-dumping measures can give a boost to dry bulk handling, the long-term trends do not look favourable. The PoR Authority together with the port community seeks to strengthen its position in this mature market and at the same time looks for new business opportunities. Two examples of new opportunities are:

Wood pellets for co-firing

The decline in coal could be an opportunity for (imported) biomass. The Netherlands energy agreement specifies 25PJ must come from biomass co-firing to meet its 2020 clean energy targets — equivalent to around 3.5mt/year of wood pellet demand. A new subsidy scheme (SDE+) was introduced to provide funding for renewable power generation in the Netherlands. Several power companies, with coal plants in the

The Europees Massagoed-Overslagbedrijf (EMO) B.V. terminal at the Port of Rotterdam.

Moving monopiles for offshore wind projects.

port (Engie, Uniper) or supplied through the port (RWE), have applied for subsidies. Successful projects are likely to take around 18 months to come online once financial close is reached. An exception is RWE's Amer 9 plant that could be sooner as it previously co-fired under the old subsidy scheme. The utilities are now working on the necessary investments in handling and storage facilities together with stevedoring companies and the Port Authority.

Monopiles for offshore wind

The development of offshore wind parks in the North Sea also provided an opportunity for the port. The Sif group selected a site, the Rotterdam Maasvlakte 2, at the start of 2015; the advantages that this location offers in terms of the production of monopiles, tubulars, and other components are clear. Sif can now produce monopiles up to 11 metres in diameter as well as coat its monopiles on location in Rotterdam.

The new location also has 40 hectares of storage capacity. With direct access to the North Sea, these parts can be shipped effectively. The site is accessible to even the largest installation vessels and seagoing barges without height and depth restrictions.

Background on the Port of Rotterdam

The Port of Rotterdam is the largest port in Europe. The port area includes 12,500 ha (land and water, of which approx 6,000 ha is business sites). The total length of the port area is more than 40km. Approximately 30,000 seagoing vessels and 110,000 inland vessels visit the port of Rotterdam every year.

An accessible port

Excellent accessibility is of vital importance to the Port of Rotterdam. Together with its partners, the Port of Rotterdam Authority is committed to ensuring that the port remains accessible. By land and rail as well as by water. Important in this respect are the interests of customers and other users, the distinguishing features of the port of Rotterdam and sustainability.

Within the port and industrial complex, the Port of Rotterdam Authority is responsible for developing and improving the four modes: inland shipping, rail, road and pipelines. It does this by making infrastructural improvements ourselves and by collaborating with other parties that play a role in the freight flows to the hinterland.

Logistics hub of Europe

In order to strengthen the port's position as the largest logistics and industrial hub of Europe, the Port of Rotterdam Authority is co-operating with various partners to further improve accessibility. The Container Transferium in Alblasserdam is an example of such a project. The Transferium is intended to relieve traffic on the A15 and reduce particulate matter emissions.

Rotterdam wins award for greenest port

During the International Green Shipping Summit 2016 in October last year, the Port of Rotterdam was voted Greenest Port of the Year. This award is granted by the participants and is a testament to the efforts of everyone in the Rotterdam port community to make the port more sustainable.

The International Green Shipping Summit 2016 was held in Rotterdam on 17 and 18 October 2016. More than 200 participants from the international shipping industry attended the event. Other nominees for the Greenest Port of the Year award were Antwerp, Amsterdam and Hamburg.

Energy transition is a priority in Rotterdam

The Port of Rotterdam Authority considers the transition from fossil to renewable energy one of the top priorities. The shipping industry plays a major role therein, including with the transition to cleaner fuels and more efficient propulsion and

energy consumption. The shipping industry and the Port Authority are already working together in many aspects in order to achieve this.

The world's largest bio-based cluster

More in general, the port is currently still dominated by oil refining, petrochemical industry, storage and consumption of fossil fuels and the generation of energy using coal. This will shift in the coming decades. At the same time, the port of Rotterdam already has the world's largest bio-based cluster, with a number of companies dedicated to the production of bio-fuels and bio-based chemicals.

In an era of change, the existing should still be fully supported, since it is necessary to keep society going and to ensure businesses are able to make sufficient returns in order to invest in innovation and in new markets. Therefore, the existing traditional industries in the Port of Rotterdam are supported while at the same time we are focused fully on new business, the promotion of bio-based activities and the support of all the possible ways of innovation.

Port of Rotterdam most dynamic European logistics hub

In the periodical *SCI/Logistics Barometer* by the Cologne-based consultancy SCI Verkehr, the Port of Rotterdam takes first place. It not only remains as it did last year, as the most dynamic European logistics hub, it is expanding its position even further. A total of 45% of German logisticians surveyed described the Port of Rotterdam as "very dynamic", which is an increase of 12% compared to 2015. The Port of Rotterdam is therefore far ahead of second-placed Antwerp (dynamic: 20%) and Györ in Hungary (18%) which took third place.

"We feel reassured in our policies by these results and the underlying assessment of logistics experts. These dynamics are a reward for our efforts in designing an ultra modern logistics hub that actively shapes excellent conditions for the quality of goods for all participants along the entire supply chain," said Allard Castelein, Managing Director of the Port of Rotterdam, commenting on the figures. "Our dynamics and potential for innovation did not stop with Maasvlakte II."

Innovation driver

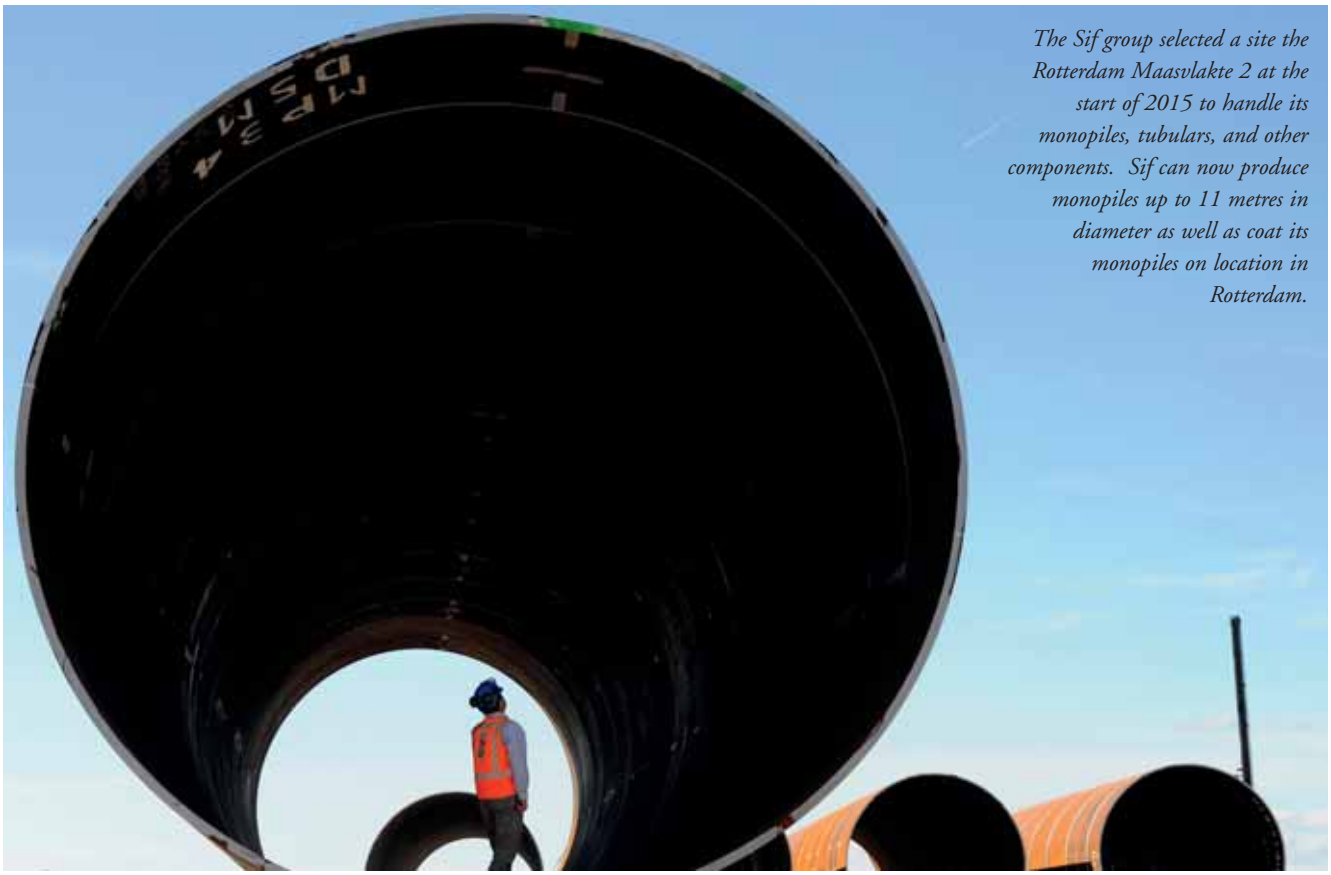
The Port of Rotterdam demonstrates its dynamism in different areas — both in shaping the future of logistics and every day logistics. The port thereby acts as an innovation and industry cluster, whether it be in co-operation with startups and contemporary industries, such as the field of chemistry, or as one of the most important clusters for LNG.

The port is constantly working on its internal port infrastructure as a dynamic logistics hub. The container terminals of APM, RWG and ECT on the Maasvlakte are already highly automated, so that large parts of the process are unmanned. The Port of Rotterdam is innovatively experimenting with networked quays.

The design of the digital information flow plays just as important a role as the actual movement of goods. Numerous tools help all partners, forwarders, logistics companies, ship-owners and freight forwarders in planning and executing the movement of goods along the entire supply chain. The Port of Rotterdam is also developing additional tools for the future.

The Port of Rotterdam does not remain at a standstill in the development of important regional connections, either. Only recently was the first railway connection between China and Rotterdam set up by partners. The port is also working on opening up new routes in Europe and Germany.

SCI/ Logistics Barometer is an indicator measured regularly that shows the economic situation and future of the industry specifically. The barometer was launched in June 2003 with a 200-respondent survey on the size, products and other indicators of representative companies in the logistics sector. DCi



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SEA-Invest places order for a SAMSON Eco Hopper

Example of an Eco Hopper in operation (©SAMSON).

SEA-Invest, one of the world's largest terminal operators with expertise spanning a multitude of port related activities in 25 ports over two continents, has placed an order for an Eco Hopper from SAMSON Materials Handling Ltd., UK, destined for operation on the Ivory Coast.

This Eco Hopper is designed to receive dry bulk materials such as cement clinker, limestone, gypsum and slag from a mobile harbour crane. The Eco Hopper will discharge onto a high-level quayside conveyor at a rate of 1,200tph (tonnes per hour) or via a dedicated outlet direct to trucks at 700tph.

SAMSON Eco Hoppers provide an environmentally respectful import solution for dry bulk materials. With a variety of dust reduction and containment measures operators will reduce material wastage and limit fugitive dust. Robustly designed to withstand cross winds and grab impact damage, the Eco Hopper is reliable in busy ports and terminals.

SEA-Invest chose the SAMSON Eco Hopper for its flexibility. In addition to being able to handle a variety of different materials, the equipment can be configured at a later stage to suit evolving port operations. Port operators need to make sure that logistics costs are compatible with the market price of the materials being transported and that their equipment can respond to changes in market conditions. Sébastien Ghesquiere, Director of SEA-Tech, the SEA-Invest Engineering subsidiary, confirms that "in a competitive market we need to ensure our service offering is reliable and value for money. Environmental responsibility is something that we take seriously at SEA-Invest. We endeavour to provide efficient, cost-effective and environmentally appropriate service and we look forward to developing our port facilities with SAMSON".

SAMSON Materials Handling has 50 years of experience in the design and manufacture of bulk materials handling equipment employed across a variety of different and diverse industries worldwide.

About the AUMUND Group

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

CASE Wichita plant achieves Silver Level designation in World Class Manufacturing

CASE Construction Equipment, global construction equipment brand of CNH Industrial N.V., has received a Silver Level World Class Manufacturing (WCM) certification for the company's skid steer loader and compact track loader manufacturing plant in Wichita, Kansas, United States.

Established in 1974, the Wichita site covers 46,000m², housing both skid steer loader and compact track loader product manufacturing and dedicated research & development. The site employs over 400 people and exports to national and international markets in the

NAFTA, EMEA, LATAM and APAC regions.

WCM is one of the global manufacturing industry's highest standards for the integrated management of manufacturing plants and processes. It is a pillar-structured system based on continuous improvement, designed to eliminate waste and loss from the production process by identifying objectives such as zero injuries, zero defects, zero breakdowns and zero waste. To certify improvements, a system of periodic audits evaluates a selection of WCM pillars, forming an overall score for each plant that is the basis for three achievement levels: Gold, Silver and Bronze.

Determining factors for this latest achievement were due to a series of category improvements including Professional Maintenance, Level of Detail and Motivation of Operators.

CASE Construction Equipment

CASE Construction Equipment sells and supports a full line of construction equipment around the world, including high-quality 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.

CASE Construction Equipment is a brand of CNH Industrial N.V., a World leader in Capital Goods listed on the New York Stock Exchange and on the Mercato Telematico Azionario of the Borsa Italiana.

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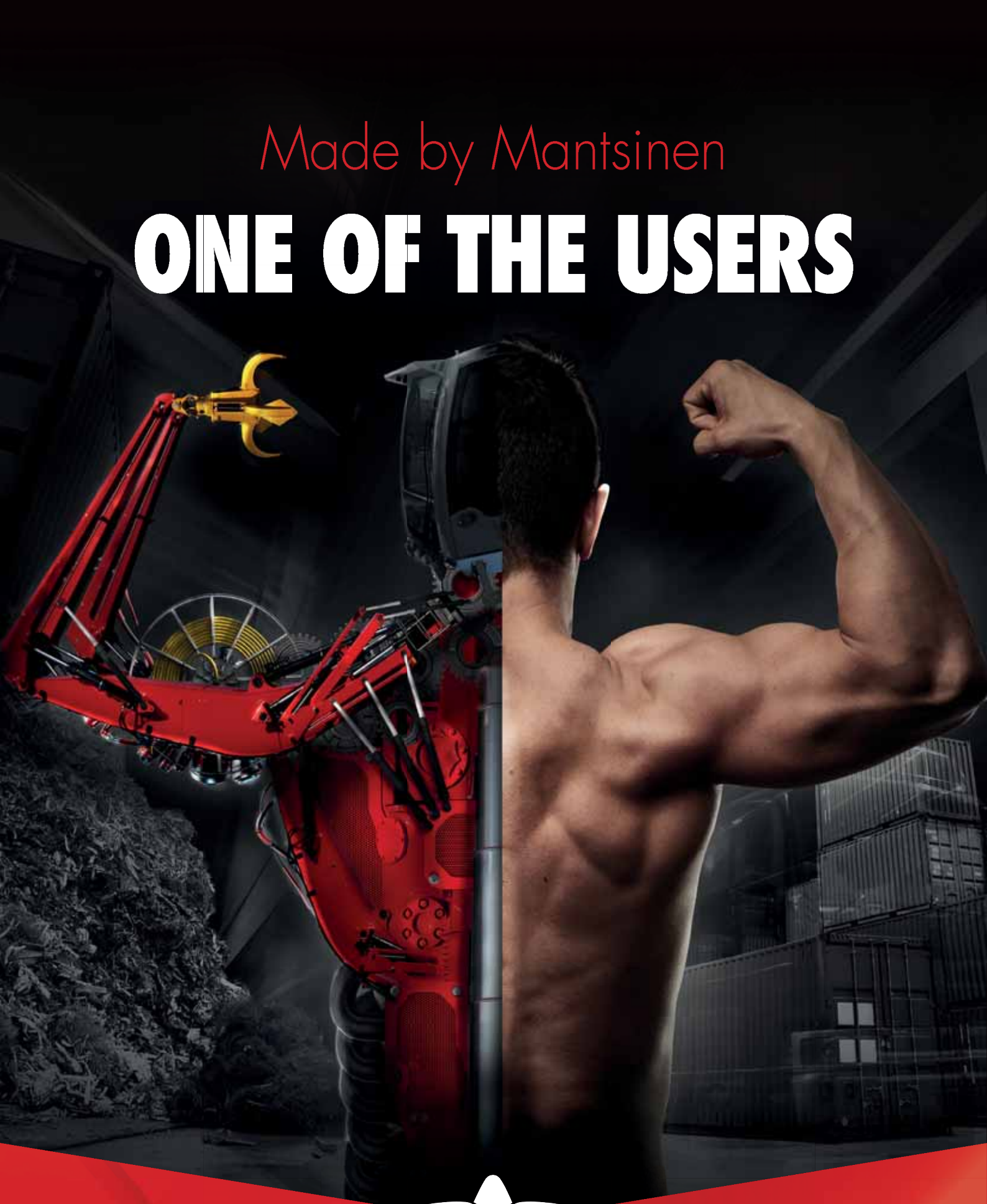

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Eriez Europe continues to expand despite Brexit uncertainty

Following a prolonged upturn in sales, Eriez is investing $425,000 in a new rotor manufacturing facility to expand its existing extensive European manufacturing headquarters in South Wales, UK, which supplies magnetic separation and metal detection equipment to customers across the UK and Europe.

Complementing Eriez' Eddy Current manufacturing sites in North America and Asia, the expansion of the well-established South Wales facility adds a third rotor manufacturing site to the company's global network, strengthening Eriez's ability to provide consistent levels of customer service excellence worldwide. Eriez Europe will manufacture and stock a range of global Eddy Current Separator rotors on-site, enabling customers to have quick access to process-critical spare rotors should they be required.

The investment at Eriez Europe will include a high-speed balancing machine and a filament winding machine to facilitate the intricate manufacture of Eriez' advanced range of Eddy Current Separators, designed to recover non-ferrous metals from a wide variety of waste streams.

The new facility will increase production capacity of Eddy Current Separator rotors per year by a third, promoting globalization of the Eriez brand and ensuring that the best possible service is provided for new and existing customers alike.

"Following continued success of supplying the Eriez Eddy Current Separators into a diverse range of industries, we are excited to be able to significantly expand our capabilities at Eriez Europe and to facilitate further growth, strengthening our market position both locally in the UK and worldwide. The ability to supply the rotors globally demonstrates our ongoing commitment to meeting the needs of our customers and offering them the best possible solutions," said John Curwen, Managing Director at Eriez Europe.

About Eriez Europe

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

Belt cleaner manufacturer introduces forever equipment guarantee

In a first for the bulk material handling industry, a global manufacturer of conveyor belt cleaning systems is offering lifetime no-cost replacement of tensioners and mainframes for belt cleaners that are fitted exclusively with the company's cleaner blades. Under the Forever Belt Cleaner Guarantee, Martin Engineering will provide replacement parts as required, for all cleaner assemblies using its urethane belt scrapers, regardless of model or blade type.

The company's replacement blades are mixed, formed and cured in a computer controlled, modular work station designed and built by the company's engineers, rather than subcontracting the production as some suppliers do. This process allows for the highest quality control and a one-day turnaround on most orders.

Engineered to effectively remove carryback, reduce material loss and provide longer belt life, the six colour-coded blade types allow operators to perfectly match urethane compounds to the specific belt, speed and types of material. Some blade types are designed to perform under extreme temperatures as low as –40°F and as high as 300°F, and others are best suited for specific cargo such as hot slag and clinker, or moist materials.

Martin Engineering primary cleaners are produced using the patented Constant-Area Radial Pressure (CARP) curved design, first introduced by Martin, to deliver consistent cleaning throughout all stages of blade life. Martin assemblies allow one-pin replacement, making maintenance a safe, no-tool operation performed from outside of the transfer chute.

Founded in 1944, Martin Engineering has grown to be a world leader in bulk materials handling technology. With a solutions-based philosophy, the family-owned company has been a leading innovator of products and services to deliver cleaner, safer and more productive bulk material processing in applications such as coal handling, mining, cement, aggregates, biomass, grain and other channels. Headquartered in Neponset, IL, the company offers manufacturing, sales and service from factory-owned business units in Brazil, China, France, Germany, Indonesia, Mexico, Peru, Russia, South Africa, Turkey, India and the UK, and under exclusive licence with ESS Australia.

Motor Driven Reels
- Monospiral and Level-Wind configurations
- Rugged and dependable magnetic coupler for dusty environments

Cable Festoon
- Corrosion-resistant, long-life rollers; precision sealed bearings
- Systems customized for the application
- Preassembled option, for easy installation

Cable Chain
- Rugged design for demanding environments
- Long operating life
- Custom-configured

Rugged Energy & Data Transmission Systems

Conductix-Wampfler has one critical mission: To keep your bulk material handling operations running 24 / 7 / 365. You need proven, worry-free energy solutions - and Conductix-Wampfler has them. Our systems provide reliable electric power and water to stacker/reclaimers, barge and ship loaders/unloaders, bulk conveyors, tripper systems, and gantry cranes. Conductix-Wampfler systems are rugged, low maintenance, and time-tested in tough, dusty environments. All products are backed by the largest sales and service network worldwide!

www.conductix.com

CONDUCTIX wampfler

DELACHAUX GROUP

FLSmidth wins order for complete cement plant in Pakistan

FLSmidth to deliver a complete cement plant to Maple Leaf Cement Factory Limited in Pakistan

FLSmidth has won an order from Maple Leaf Cement Factory Limited for engineering, procurement and supply of equipment for a complete cement production line with a capacity of 7,300 tonnes per day. The plant will be located in Iskanderabad in the Mianwali District, Pakistan.

The order includes a complete range of equipment from crushing to packing and cement loading. FLSmidth's supply also includes equipment from product companies of FLSmidth, such as planetary gear units from FLSmidth MAAG Gear, electrostatic precipitators and fabric filters from FLSmidth Airtech, a packing plant from FLSmidth Ventomatic, a control system and plant automation from FLSmidth Automation, and weighing and metering systems from FLSmidth Pfister.

"This is the latest project to underline FLSmidth's strength as the leading supplier of the most productive and energy-efficient equipment and technology — and our position as the preferred supplier of complete production lines to the Pakistani cement industry," says Group Executive Vice President, Cement Division, Per Mejnert Kristensen.

FLSmidth is a market-leading supplier of productivity to the global mining and cement industries. Headquartered in Copenhagen, Denmark, and with offices in more than 50 countries, FLSmidth delivers engineering, equipment and service solutions to customers worldwide. Productivity, sustainability, and quality are focus areas for the 13,000 employees in FLSmidth. The company generated revenue of DKK20 billion in 2015.

Order details

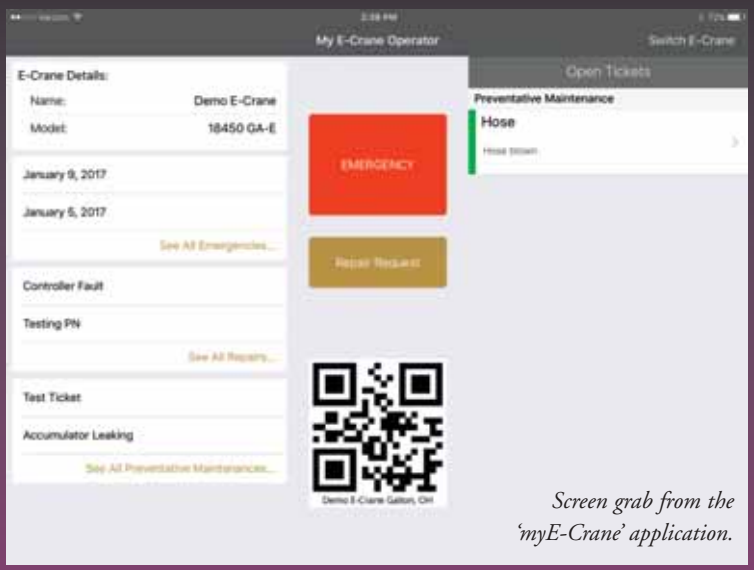
- **order size:** more than €75 million;
- **scope:** a complete state-of-the-art cement production line with the latest environmental pollution control systems and technology for the highest levels of energy efficiency and maintainability;
- **equipment:** ATOX® 52.5 vertical mill for raw grinding, ATOX® 27.5 vertical mill for coal grinding, EV™ 200x300 hammer impact crusher, stacker and reclaimer systems for storage, ROTAX-2® rotary kiln with low NOx ILC calciner, FLSmidth® Cross-Bar® cooler, JETFLEX® burner, and two OK™ 39-4 vertical mills for cement grinding;
- **plant capacity:** 7,300 tonnes per day;
- **customer:** Maple Leaf Cement Factory Limited;
- **geography:** Iskanderabad, Pakistan; and
- **timescale:** the order will be fully executed by the end of 2018.

E-Crane launches myE-Crane application

Next Generation Service Logistics

E-Crane International USA, Inc. has announced the roll-out of the 'myE-Crane Application'. This simple-to-use application works with a smart phone and keeps the equipment operator, maintenance technicians and management staff up to date and informed, in real time.

The goal is to allow direct communication from the E-Crane operator to the E-Crane company service group. All communication and actions are data-based, preventing miscommunication.



Screen grab from the 'myE-Crane' application.

A secure iPad located in the operator cab lets the operator report a problem with the click of a button. This creates a service ticket and immediately notifies management and technicians assigned to that E-Crane. All communication between the operator and technician is recorded and tracked, along with any spare parts that are added to the ticket. If the issue requires E-Crane service personnel on site, the application even tracks the technician location and sends a notification when the technician is on site. Once a ticket is closed out, all data is stored as a report within the app.

This ensures that everyone associated with the E-Crane is well informed, and all services are tracked and reported. This will completely streamline the technician deployment process, shorten response time, reduce down time and provide instant reports for E-Crane customers.

E-Crane is always looking for ways to improve and achieve solutions for its customers, and the 'myE-Crane' application is another step toward even better customer service.

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Tom Noble, Department Supervisor, Powersouth Energy

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Continuous Ship Unloaders
World Bulk Conference, USA
Coaltrans USA 2017
Coaltrans India 2017
Global Grain Asia 2017

FEBRUARY

GLOBAL COAL TRADES
Coal Terminal Developments
Coal Handling Systems
Self-Unloading Vessels & Technology
Ships' Agents
Offshore Stevedoring & Transshipment
Covered Storage
Coaltrans China 2017
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MARCH

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Belt Conveyor Systems & Technology
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United Kingdom
Project Cargo and Warehousing
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APRIL

ASIAN COAL & AGRIBULK TRADES
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Grab Manufacturers
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Spain & Portugal
Portable Bulk Handling Equipment
2017 World Coal Terminal Guide
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MAY

GLOBAL CEMENT TRADES
Scandinavia
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Bagging Equipment & FIBCs
Cement Handling & Storage
Software & Automation
Lower Mississippi
Biomass Storage & Handling
Norshipping 2017
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JUNE

AMERICAS COAL TRADES
Coal Handling Technology
The Netherlands
USA Engineering Expertise
Marine Paints & Coatings
Ship Loading Technology
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JULY

BAUXITE & ALUMINA TRADES
North American West Coast
Inland Rail & Barge Transportation
Forest Products
Rail & Barge Handling Technology
Crane Controls & Components
Engineering Consultants
Bulker Classification
2017 Grain Handling Directory
Global Grain South America 2017

AUGUST

IRON ORE TRADES
Petcoke: Special Report
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Mechanical Ship Unloaders
Shipboard Cranes & Grabs
North American East Coast
Pulp & Paper
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SEPTEMBER

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Grain Materials Handling
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OCTOBER

EUROPEAN COAL TRADES
Hamburg-Le Havre Port Range
Stockyard Equipment
Self-Unloader Update Report
Bulk Handling Drives, Systems & Controls
Scandinavia
2017 Coal Handling Directory
World Coal Leaders Network 2017

NOVEMBER

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DCi

2017 Editorial Programme

Fit for purpose: FPT chooses SENNEBOGEN 840 scrap handler

The high rise cab and the 3m pedestal gives the operator an 18.5ft foot perspective and can see right into the conveyor feeding the shear.

With scrap recycling facilities throughout the Great Lakes region and down to Florida, Ferrous Processing & Trading (FPT) is involved in every aspect of the industry. The latest material handler added to the fleet is an electric drive SENNEBOGEN 840 scrap handler.

Tony Benacquisto is charged with keeping all of those facilities equipped to perform profitably. "I'm the one that goes out to find new equipment," he explains. "I have to find the most efficient way of doing something and see how we can improve our bottom line." Among Benacquisto's recent 'finds' is a new electric drive SENNEBOGEN 840 scrap handler, commissioned in March of 2015 at FPT's Strong Steel Products yard in Detroit, MI, USA. He chose the 840 to feed flattened cars and #2 scrap to the largest shredder in the region. But this isn't the first time his search for cost-effective equipment has led him to SENNEBOGEN. All told, FPT operates several SENNEBOGEN material handling machines. The Strong facility also has a rubber-tyred version of the new machine, an 840 M model, and another electrically powered machine, a SENNEBOGEN 835 R-HD, is running at the nearby FPT Kronk facility. "We've had the 835 electric going for four years and had great success with it. So we had the measurable results from it to compare numbers when we were looking for a new electric drive machine."

To match up with the mega-shredder, Benacquisto knew he wanted electric drive. "I've had electric equipment in the past, going back to our electric overhead cranes. I knew the efficiency of electric as compared to diesel; when you add the rising price of diesel to the maintenance cost of diesel, it far exceeds what electricity costs. With the way the price of diesel was jumping a year ago, it just made sense to go electric." The Strong Steel site is a 9-acre yard and processes in excess of 200,000 tonnes per year. The operation is purely focused on shredder throughput. Flattened automobiles arrive on trailers. They are fed through the shredder and ferrous material is separated by a magnet. The clean material is shipped to customers by rail and truck. The SENNEBOGEN machine was chosen to perform simply, quickly and reliably.

Operator Jeff Beebe in front of Ferrous Processing & Trading's new 840 E-Series Electric Machine.

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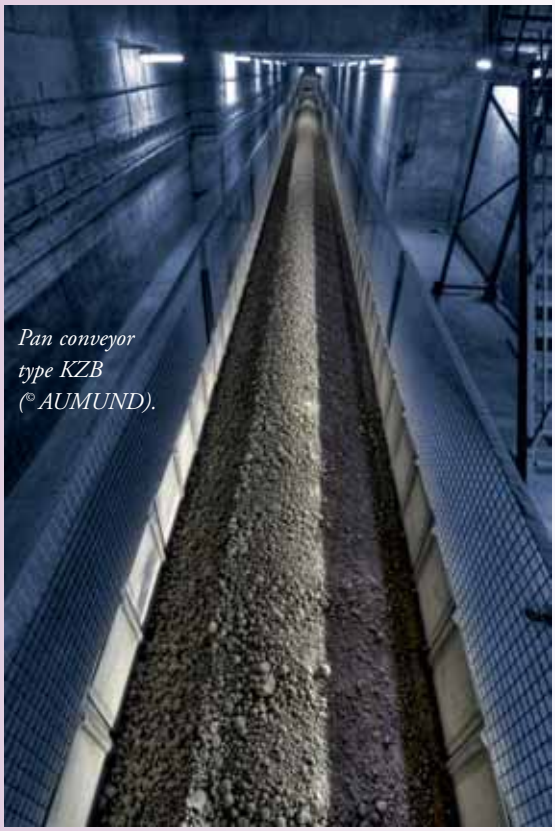
ECO-FRIENDLY PRODUCT LINE

Turkish companies place major orders with AUMUND

Çimsa Cimento and Baticim order over 100 machines for three sites

AUMUND Fördertechnik is strengthening its share of the Turkish market. Çimsa Cimento has now ordered about 60 AUMUND machines for the plants in Eskisehir and Niğde in Turkey. With five kiln lines in Mersin, Eskişehir, Kayseri, Niğde and Afyonkarahisar — as well as a grinding plant in Ankara and two cement packing plants in Marmara and Malatya — Çimsa is one of the leading producers in the Turkish cement industry. A further 41 machines were ordered by Baticim for the plant in Söke. With the arrival of these two large orders, AUMUND has now sold more than 150 machines to the Turkish cement industry within one year.



Pan conveyor type KZB (© AUMUND).

By the end of 2016, AUMUND had supplied the Eskisehir plant with six central chain bucket elevators, with centre distances between 25m and 68m and capacities from 40tph (tonnes per hour) to 400tph. The package also comprised ten belt bucket elevators with centre distances between 17m and 95m and capacities from 200tph and 350tph. Also six AUMUND 800mm pan conveyors with centre distances between 15m and 47m and capacities from 150tph to 250tph were ordered.

The type of pan conveyor that can convey material in the upper run and the lower run at the same time is only built by two manufacturers worldwide. The material can be discharged by opening any of a number of remotely controlled intermediate stations positioned as required along the conveyor. The AUMUND type ordered for the Eskişehir plant is an SPB, with a centre distance of 42m and a capacity of 250tph. This particular model is equipped with three discharge stations.

This pivoting pan conveyor permits material feed into silos through stationary discharge stations. The pan construction allows the material to be distributed between several silos and bunkers. As a result any additional equipment, such as conveyors with their supporting structures and transfer chutes, is no longer necessary.

The order for Eskisehir is completed by three trough chain conveyors.

For the Niğde plant, AUMUND will supply three central chain bucket elevators, with centre distances between 25m and 37.5m and capacities from 50tph to 400tph. The order also comprises six belt bucket elevators with centre distances between 31m and 91m and capacities from 250tph to 350tph. To convey clinker a bucket apron conveyor with a centre distance of 40m and a capacity of 250tph will be used. The clinker dust will be transported by three trough chain conveyors.

Pivoting pan conveyor type SPB (© AUMUND).

Batisöke Söke Cimento will take delivery in mid-2017 of 14 central chain bucket elevators, with centre distances between 22m and 43m and capacities from 130tph to 600tph. The order also comprises five belt bucket elevators with centre distances between 60m and 125m and capacities from 300tph to 650tph, and 15 AUMUND pan conveyors with widths ranging from 800mm to 1,400mm, centre distances between 49m and 146m and capacities from 300tph to 600tph. Six sets of truck loading equipment will also be supplied.

About the AUMUND Group

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

FLSmidth cement plant order in Colombia

FLSmidth has signed a contract with OHL Industrial for engineering, procurement and supply of equipment for a complete cement production line with a capacity of 3,150 tonnes per day.

The plant will be located in Rio Claro, Municipio de Sonson Departamento de Antioquia, in Colombia. The end client of the project is EcoCementos (Empresa Colombiana de Cementos S.A.S), a company jointed owned by Cementos Molins and Grupo Corona, with which OHL Industrial has an EPC (engineering, procurement, construction) contract.

The order includes a complete range of equipment from crushing to packing and loadout, including; ATOX® 37.5 vertical mill for raw grinding, ATOX® 17.5 vertical mill for coal grinding, ROTAX-2® rotary kiln with low NOx ILC calciner, FLSmidth® Cross-Bar® cooler, and O™ 39-4 vertical mill for cement grinding.

Order details

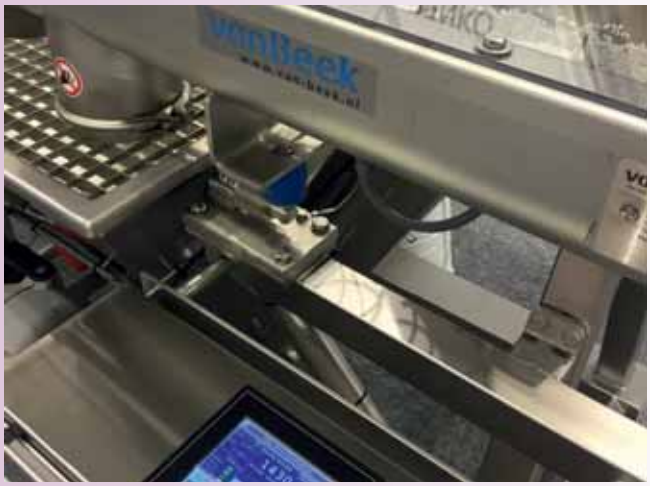
- **order size:** more than US$60 million;
- **scope:** a complete state-of-the-art cement production line with the latest environmental pollution control systems and technology for the highest levels of energy efficiency and maintainability.;
- **plant capacity:** 3,150 tonnes per day;
- **customer:** ECOCEMENTOS SAS;
- **geography:** Antioquia, Colombia; and
- **timescale:** the order will be delivered in the first quarter of 2018.

FLSmidth's supply also includes equipment from product companies of FLSmidth, such as planetary gear units from FLSmidth MAAG, fabric filters from FLSmidth Airtech, packing plant from FLSmidth Ventomatic, control system and plant automation from FLSmidth Automation, and weighing and metering systems from FLSmidth Pfister.

"The project underlines FLSmidth's strength as a leading supplier of the most productive and energy-efficient equipment and technology — and our market leader position as a full plant scope provider," says Per Mejnert Kristensen, Group Executive Vice President, Cement Division.

Controlling mass flows in screw conveyors

Thanks to unique cooperation between Van Beek Schroeftransport and weighing specialist Penko Engineering, real-time monitoring of how much product the screw is transporting is now possible. This offers huge possibilities.



The user decides

One can for example decide how many grams of a particular material per minute may be supplied to the process. The screw conveyor then adjusts the speed to this. The screw conveyor can also be programmed to stop on reaching a certain weight, or first empty itself and then stop.

Measurement is the key

During operation it is possible to see the material speed (m/s), number of kg/s, how many kg have already been transported and the control of the flow regulation from 0 to 100 %. This is possible by determining the mass of the screw plus contents with special strain gauge recorders. The movement and the speed can be fixed with a speed monitor.

Exhibited in the Factory of the Future

Visitors to the Industrial Processing exhibition were the first to see this and were able to try out the weighing screw on the spot. With a press on the button, they could increase or reduce the capacity easily, upon which the screw conveyor responded immediately by adjusting the speed. They could also give the screw the command to stop transport after a certain quantity.

Superior launches new solution for washing crusher fines

Superior Industries, Inc., a US-based manufacturer and global supplier of bulk material processing and handling systems, launched a new solution within its line of washing and classifying machinery, which processes crusher fines right next to the crushing circuit. Known as the Alliance™ Low Water Washer, the unit accepts a dry feed directly from the crushing circuit and processes the material into higher value manufactured sand.

"The equipment washes and process these fines and creates another source of income for the owner," says John Bennington, director of washing and classifying at Superior Industries. "Historically, all of the machinery used to wash crusher fines has been the same design as sand washing equipment. The Alliance Low Water Washer is designed specifically for washing crusher fines and uses 80% less water than the traditional screw/screen combination."

The agitator section is positioned at the front end of the screen where water is added to the dry feed and mixed, producing a thick slurry. This slurry is then dumped onto a dewatering screen with a series of spray bars to help clean and wash out the fines. The end result is a salable manufactured sand with just 8% moisture content.

Superior manufactures models of its new Alliance Low Water Washer for rates up to 300tph (tonnes per hour) (272 metric tph). Custom designed machines can produce higher rates if required.

About Superior Industries, Inc.

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

CFS Handling delivers hydraulic bucket to Denmark

CFS Handling delivered an electro hydraulic bucket with automatic greasing system SKF in Denmark on 21 December last year.

About CFS Handling

CFS Handling operates in the design and construction of equipment for material handling. Thirty years experience of the management team merges into a new company based on three pillars: Innovation quality and efficiency. The company, located in Montichiari in the province of Brescia in Italy, makes use of facilities and operational structures of advanced industrial level.

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CSUs extend their reach

Louise Dodds-Ely

Successful delivery of Tenova TAKRAF CSU to the Port of Pecem in Brazil

Global mining, bulk material handling and minerals processing solutions provider, Tenova TAKRAF, recently completed the delivery of a continuous ship unloader (CSU) to handle iron ore at the Port of Pecem, Brazil. The major turnkey contract was awarded by Secretaria Da Infraestrutura (SEINFRA) – Governo Do Estado Do Ceara in March 2014.

The CSU has a nominal capacity of 2,400tph (tonnes per hour) and is able to unload vessels up to 125,000dwt.

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The CSU is equipped with a bucket-chain elevator approximately 35m in height and with a slewing/lifting boom, which includes the transfer conveyor, for a total length of 42m. The discharge on the conveyor jetty is via a vibrating feeder, a solution that has already proven highly successful on other machines, and which offers a number of advantages. Some of these advantages include being more compact and hence reducing the height of the machine; an important factor to consider given that the jetty conveyors are more elevated than usual.

The entire project was successfully concluded thanks to the excellent collaborative effort and synergies between the various TAKRAF offices: design and construction of the CSU was carried out in Italy; TAKRAF's China office was fully engaged and oversaw all matters related to complete manufacturing and assembly of the machine, whilst the company's Brazil office was responsible for all local project activities up to commissioning.

This major contract award was TAKRAF's first from SEINFRA and was won as a result of a number of important factors having been considered in the final decision. Since the CSU was to be installed in an area close to the city, the client placed specific emphasis upon limiting environmental impact and selected TAKRAF's machine for its various environmentally friendly solutions. One of these solutions relates to the fact that the material flow is totally enclosed with the 'digging foot' operating within the ship's hold and discharging material through transfer chutes, maximizing dust suppression and noise reduction.

TAKRAF developed the bucket-chain CSU in the 1980s and has subsequently supplied more than 15 machines to date worldwide with a variety of technological improvements having been applied to each new machine. The most sophisticated part of the machine is the articulated-type 'digging foot' for which TAKRAF Italy owns the patent. Through the co-ordinated movement of dedicated hydraulic cylinders, the digging foot can modify its geometrical configuration to obtain optimal bucket filling and to reach the walls of the ship's hatches to remove residual material. Recent contract awards for bucket-chain CSUs from, for example, ENEL (the main Italian power station in Brindisi and Civitavecchia) and ILVA (Taranto Iron & Steel Works, also in Italy), once again highlight the excellent performance that is achieved through this technology.

Once the manufacturing and assembly process was concluded, the CSU (machine body and elevator) was moved inside the Tianjin (China) harbour, from a private to a public quay, through a special barge and crane vessel, in order to allow for the mooring of a specialized transport vessel. The greatest challenge facing the project was in fact the transport of the CSU (boasting an approximate weight of 1,800 tonnes) almost fully erected from China to Brazil. The operation was successfully concluded within the expected transit time of 35 days and the Provisional Acceptance Certificate was released in November 2016. The entire project was successfully concluded thanks to the positive collaboration with SEINFRA and the constant coordination and cooperation between all parties concerned.

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.

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VIGAN increases its food and feed security role in Saudi Arabia

The first grain handling machine delivered by VIGAN to Saudi Arabia was a 300tph (tonnes per hour) shiploader, bought by GSFMO (Grain Silos and Flour Mills Organization) for the Port of Yanbu back in 1992! At that time, Saudi Arabia was a large wheat producer and exporter.

However, times have now changed. Decades ago, the Saudi Arabian government put in place a programme dedicated to push local wheat production. However, the rising water scarcity that Saudi Arabia was facing, the lack of arable land, and the increasing population made this production more and more difficult to manage — and very expensive.

In 25 years, the country has gone from exporting wheat to relying on imports. This is indeed a good use of its internal resources.

GSFMO (renamed SAGO – Saudi Arabia Grains Organization) is the public authority in charge of grain imports for subsidized food in Saudi Arabia. It aims to supply wheat and flour to the entire Saudi Arabian population. In this changing context, the company has chosen VIGAN as the preferred partner for its grain ship unloaders.

VIGAN is also supplying ship-unloaders to private stevedoring companies operating various ports.

Recently, VIGAN has installed several 600tph ship unloaders in various ports in Saudi Arabia, among which: two machines in Jeddah; two in Jazan; two in Dammam; and three in Yanbu. All of these were delivered between 2014 and 2016. VIGAN is proud not only to sell its machines in Saudi Arabia, which is becoming one of its biggest partner countries, but also to contribute to feeding the country's population every day. This relationship represents a strong link between the large Kingdom of Saudi Arabia and the Kingdom of Belgium.

VIGAN shiploader installed in Yanbu in 1992.

These VIGAN ship-unloaders have a capacity of 600tph. Mounted on a gantry on tyres or on rails, equipped with two electrical motors of 250kW each (total 500kW) and a 30m suction boom, NIVs are designed for the most efficient discharge of wheat from vessels of up to 80,000dwt of various origins including the EU, North America, South America and Australia.

For the last five years, the majority of VIGAN sales have consisted of large 600tph unloaders, mainly in the Middle East and North Africa.

The advantages of VIGAN pneumatic CSUs are numerous:

- **unloading** of all sizes of vessels and all types of grain;

Two 600tph NIVs installed in Jeddah.

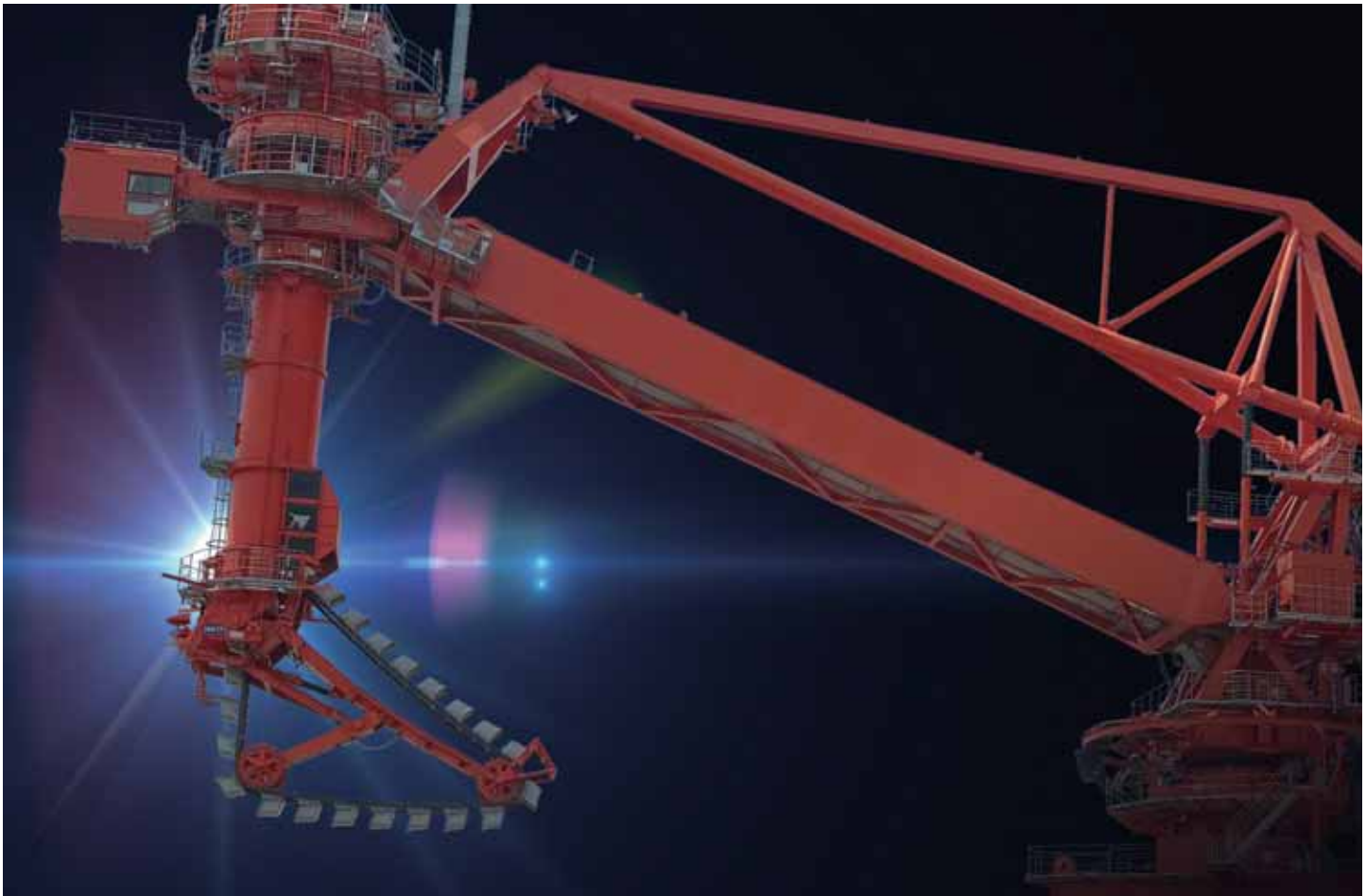
Two 600tph NIVs installed in Jazan.

Two 600tph NIVs installed in Dammam.

- **reliability:** good conceptual design and the use of state-of-the-art manufacture process with the latest generation of components and materials;
- **low maintenance costs:** namely thanks to the use of very high resistance alloys (e.g. for the elbow and the piping);
- **efficiency:** limited unwanted stoppages, good cover of the ship hold, efficient and quick hold cleaning from hatch opening to final closing at the end;
- **minimum manpower costs:** one single operator for the entire ship unloading period;
- **low energy consumption:** less than 0.6kWh/t. The multi-stage turbo blower, with direct drive, is controlled by a frequency inverter;
- **environment friendly:** limited dust, spillage and noise;
- **safety:** namely by favouring operator working conditions; and finally...
- **the best capacity/price ratio** in terms of investment and operating costs!

Two 600tph NIVs installed in Yanbu.

Since its creation in 1968, VIGAN has honed its expertise in CSU reliability and its expertise to advise its customers for efficient unloading operations.



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Sumitomo Heavy Industries Material Handling Systems Co.,Ltd.

As a member of the Sumitomo Heavy Industries Group, Sumitomo Heavy Industries Material Handling Systems Co.,Ltd. provides the full range of services throughout the life of all machinery it manufactures, providing solutions for every stage, encompassing maintenance, repair, modifications, parts supply, and facilities' modernization and optimization. Continuous ship unloaders (CSUs) represent a major part of its portfolio.

Products

- **Continuous ship unloader**
  - bucket elevator type
  - twin belt type
  - vertical screw conveyer type
- **Overhead cranes**
  - common cranes
  - steel manufacture
  - shipbuilding
  - automatic cranes
  - other overhead cranes
- **Jib cranes/luffing cranes**
  - rail-mounted jib crane
  - tyre-mounted jib crane
  - rail-mounted level luffing crane
  - tyre-mounted level luffing crane
- **Bridge/gantry cranes**
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  - bridge-type crane for product shipping
  - bridge-type unloader
  - semi portal crane for longeron
  - container crane
  - rubber-tyred gantry crane
  - SYBRID SYSTEM
- **Stockyard equipment**
  - stacker-reclaimer
  - blending reclaimer
  - stock yard equipment
  - shiploader
- **Others**
  - work vessel

Lifecycle Solution

The service operations of Sumitomo Heavy Industries Material Handling Systems Co.,Ltd. rest on two pillars: material handling system operations, which encompass cranes from small and medium-sized overhead cranes to large cranes, as well as unloaders and other transport systems; and logistical-systems services, which handle the products of the Logistics and Parking Systems Division of Sumitomo Heavy Industries, Ltd.

Continuous Ship Unloader

With increasing awareness of environmental issues in recent years, the Sumitomo CSU has contributed to zero emissions.

The company's effort to improve the efficiency of unloading commenced in 1968, culminating in the delivery of its first machine in 1976.

Its line-up includes the twin-belt type and the vertical screw type.

Sumitomo's full line of continuous unloader gives customers the freedom to select the optimum machine for the particular material to be handled, vessel size and unloading capacity.

CSU features

- **High-performance handling, three modes of digging**
  The Sumitomo CSU minimizes unloading time with three modes of digging: horizontal L-mode, swing-out digging mode and catenary bottom clean-up mode. These modes allow the CSU to efficiently unload a wide range of vessel sizes.
  The swing-out digging mode can incline the digging head to a maximum of 35°, in order to reach deep into the ship hold.
  The catenary bottom clean-up mode allows the buckets to efficiently scoop up the last remaining material, even with the ship is moving from wave action, without damaging the hold bottom.
- **Outstanding maintainability**
  All main motions of the Sumitomo CSU, except for some secondary motions, are electrically powered. Compared with hydraulically powered CSU, the electrically powered Sumitomo CSU are much easier to maintain and operate. Guide rails for the bucket chain have been eliminated on the Sumitomo CSU, which prevents excessive load on the digging head, resulting in less wear on the buckets.
- **High safety and reliability**
  All structural fatigue calculations of the Sumitomo CSU follow stringent JIS standards. During operations, the advanced overload protection system for the bucket elevator minimizes fatigue loads on the structure. The optional fatigue life monitoring system will facilitate fatigue prediction to enhance fatigue life.
- **Environment friendly**
  The fully enclosed material pathway allows the Sumitomo CSU to eliminate dust and spillage. All major motions are electrically powered, reducing vibration, noise, oil leaks and enables greater energy efficiency.

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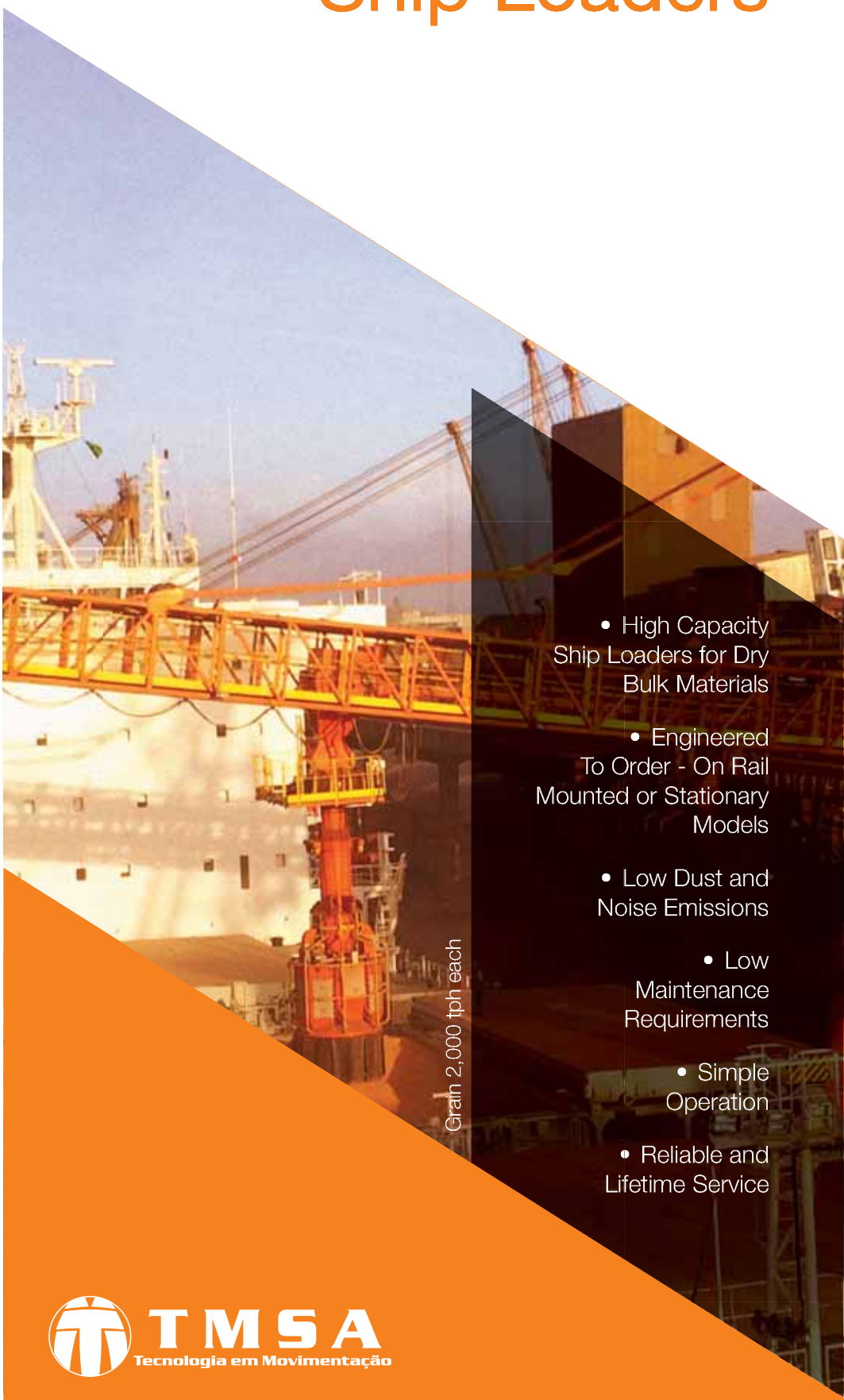

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Pneumatic transport and loading chute for dust-free ship-unloading of cement

Ships that are loaded with cement can be unloaded dust-free using a pneumatic loading and unloading installation. Van Aalst Group specializes in both mobile self-unloaders and unloading systems that are installed on cement carriers. The installations are always equipped with a TBMA loading chute to ensure the dust-free transfer of product.

Shiploads of cement can be transferred efficiently and dust-free into silos using a pneumatic loading and unloading facility. These facilities can be equipped with a loading chute that is able to fill bulk trucks and/or railcars.

If a port only occasionally docks a cement-carrying ship, it will not necessarily be equipped with an onshore pneumatic unloading system with loading chute. In this situation, it is better if the vessel itself is equipped with an unloading installation. These vessels are especially useful as they can sail all over the world, and call at ports that lack the appropriate infrastructure for unloading cement.

Pneumatic unloading systems can be installed on vessels from 2,000dwt, but are of particular interest for cement carriers transporting up to 30,000 tonnes of cement. Unloading capacities can range from 100tph (tonnes per hour) to 1,200tph.

Companies like Novalgoma, which rent cement carriers, therefore often equip their (new) ships with installations from Van Aalst. Van Aalst Group BV has been active in the engineering and construction of pneumatic handling systems for self-unloading cement carriers since the 1970s. The corresponding loading chutes are designed and delivered by TBMA in Noord-wijkerhout.

Cement carriers

In cement carriers, the equipment for pneumatic unloading is placed in an engine room between two cargo spaces of the ship. In both spaces, a suction pipe is placed which ends at the bottom of the hold. A provision is placed in the pipe of the suction nozzle for mixing the cement with air, so that the powder can be easily sucked into the transport vessels. In order to minimize the wear and tear in the suction pipe, the bends are less than seven times the radius of the pipe's diameter, and they maintain the full diameter throughout the whole length.

The length and diameter of the suction nozzle co-determine the required vacuum capacity. The flat bottom is aerated to fluidize the product to ensure that the very last bit of cement flows into the mouthpiece of the suction pipe.

Re-loader tanks

The re-loader tanks in the engine room first are filled and then pressed empty. A vacuum pump first empties Tank One. Then a valve connected to the suction pipe opens, allowing a mixture of cement and air to be drawn into the vessel. The air escapes at the top of the vessel through a dust filter; the cement remains in the vessel as a result of the force of gravity. The amount of cement in the boiler is monitored by a level probe. Once Vessel One is full, the system switches automatically several valves, so that Boiler Two is filled. During the filling of this boiler, Boiler One is being emptied with the aid of a compressor. Thanks to alternately switching from sucking and pressing on both boilers, an almost continuous flow of product is achieved. The cement is forced through a pipe system into a manifold, where a connection can be made to a storage facility such as a silo (or another ship's hold). However, it is also possible to blow the cement silo to a buffer on the ship's deck. From there on, it can be loaded into railcars or silo wagons on shore via TBMA's dust-free loading chute.

TBMA's loading chute

Van Aalst equipped the pneumatic unloading systems of various cement carriers with TBMA's loading chutes. The discharge capacity of the unloading system is large enough to activate two loading chutes at the same time. For example, a cement carrier of Novalgoma is provided with a tandem system. Both loading chutes, which are mounted a fixed distance apart, are supplied with so called 'skirts' to be able to load trucks dust-free. The spouts are provided with level sensors to monitor the product level.

Tracking system

This tracking system is fully automated in order to be able to take into account various effects at the same time; the rise of the ship during discharge (because the ship is lighter) and the rise of the product level during loading. This system is also sophisticated enough to compensate for level changes that are due to tidal movement. A height difference up to 7m can be bridged by the loading chutes, to ensure dust-free transport under all conditions. Each loading chute has its own de-dusting system feeding the dust back into the main product stream to ensure that no product is spoiled.

Offshore supply vessels

The principle of pneumatic handling is so interesting that it is not only cement carriers that are equipped with these installations. Van Aalst for example, also provides them for offshore supply vessels (OSVs) that deliver cement to oil rigs at sea. The cement is used to reinforce the holes so that they do not collapse. OSVs have a relatively small capacity so that it is possible to make use of pressure tanks and to blow it dry with the aid of solely an over pressure system (so without the use of vacuum technology). The limited transmission capacity of these ships is no disadvantage. The relatively short distances from the ports to the platforms make it possible to maintain these shuttle services.

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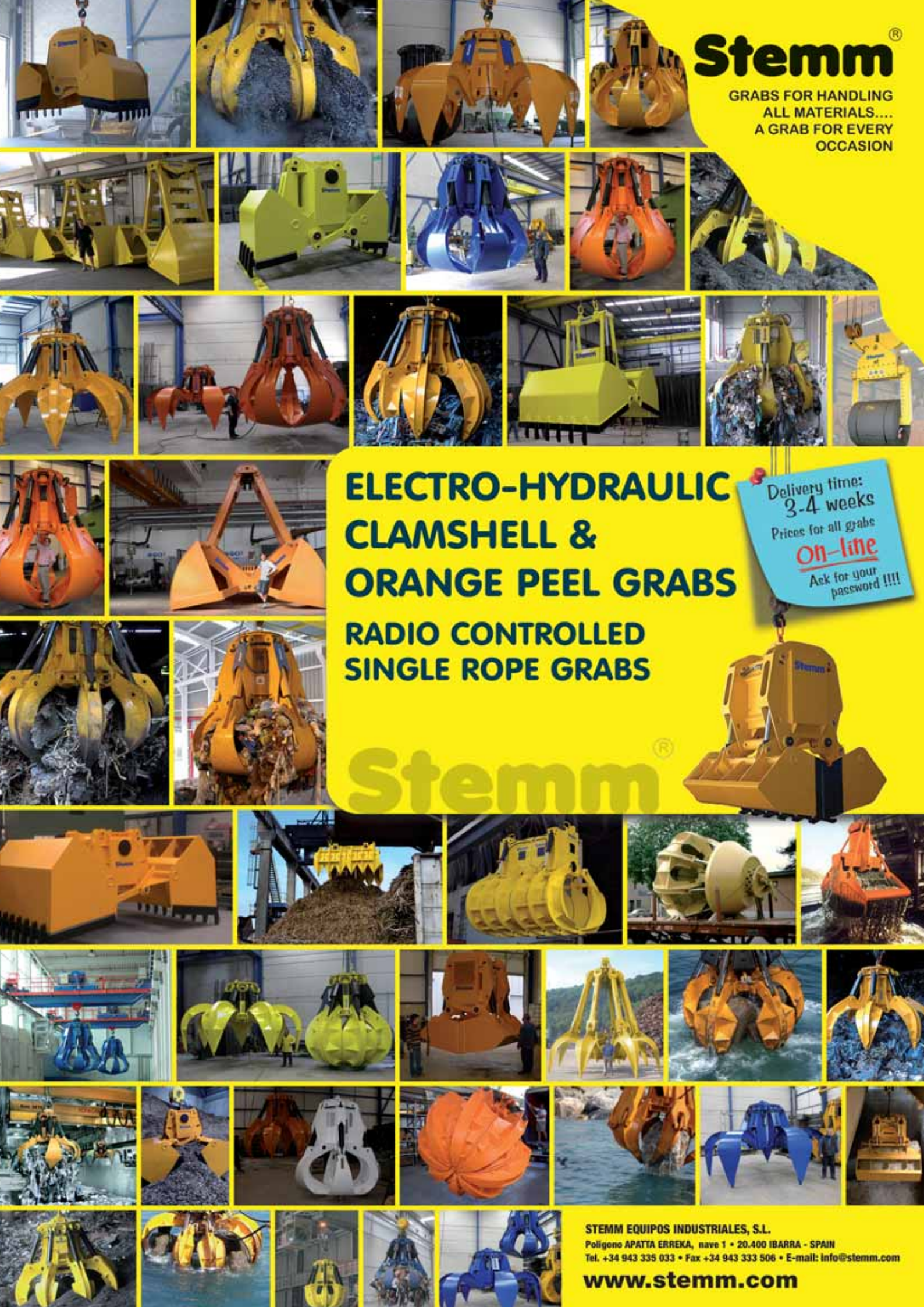
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Bühler: over 100 years experience in the design and manufacture of CSUs

Bühler has over 150 years of experience in processing and handling food products and has gained considerable experience in the continuous unloading of ships. Over 100 years ago, the first mechanical unloader was designed and installed by Bühler, and continuing product improvements have shaped the company's continuous ship unloaders (CSUs) — such as the Portalink — to their current form.

Key in design and product improvement is always setting new industry standards to, for example, significantly reduce energy usage, product breakage, and overall operating costs. Moreover a clear customer advantage for the Portalink CSU is increased efficiency due to easy operating, which is supported by the auto sink in function, which often makes it a better customer solution.

Through its long-term and intensive market experience, Bühler has developed a broad and extensive product portfolio. The Portalink product range offers a versatile range of models to meet Bühler's customer requirements for fast, optimal unloading of ships. For example, the Portalink is an ideal mechanical unloader for oceangoing vessels of up to 125,000dwt, and has an unloading capacity ranging from 300–1,500tph (tonnes per hour).

Commodities handled

Bühler's Portalink range uses a high-capacity horizontal en-masse chain conveyor, which unloads free-flowing and mealy products from the

ships hold onto a quay conveyor or truck loading spout. It does so in a way that is totally enclosed and gentle. Free-flowing cargoes include products such as wheat, corn, soybeans and rice. The Portalink — with its high efficiency rate, combined with low operating costs — is also ideal to handle non-free-flowing commodities such as soymeal, sunflower meal, and DDGS (distiller's dried grains with solubles).

The product is gently picked up by the chain filling the complete conveying shaft, ensuring a high efficiency rate of the complete unloading process. The product is moved with a uniform low speed between 1m/s and 3m/s up the conveyor. In this way, the product experiences minimal friction, resulting in very gentle product movement. This compares particularly well with pneumatic unloading systems, where the product is unloaded at a minimum speed of 20m/s and 30m/s, hits a baffle plate and can result in product value devaluation with more broken kernels.

Client base

Major clients for Bühler's mobile harbour equipment are, naturally, the large trading and importing facilities which demand reliable, high capacity, efficient unloading and loading equipment which has low operating costs. Other trusted and important Bühler customers include direct end-users such as millers, brewers, feed plants, etc.

Staying competitive with product innovation

Mechanical CSUs such as those in the Portalink range boast market-setting standards for low energy consumption, high operating efficiency due to easy handling for the operators, and high availability due to reduced maintenance time and low wear and tear, all result in a short return on investment (ROI).

This year, Bühler has added to its Portalink range, increasing unloading capacity to 1,500tph, one of the largest capacities available on the market for unloading grains. This added Portalink model of course offers all the usual benefits such as low energy costs which can be as low as 0.35kWh/tonne of unloaded product!

In the last year, Bühler has focused on a new operating and control system for its loading and unloading portfolio. The operating system is developed on direct customer feedback to simplify the basic functions and increase functionality for maintenance and traceability. This reduces time needed to search for errors, train new staff to understand the equipment, and therefore generates a higher ROI.

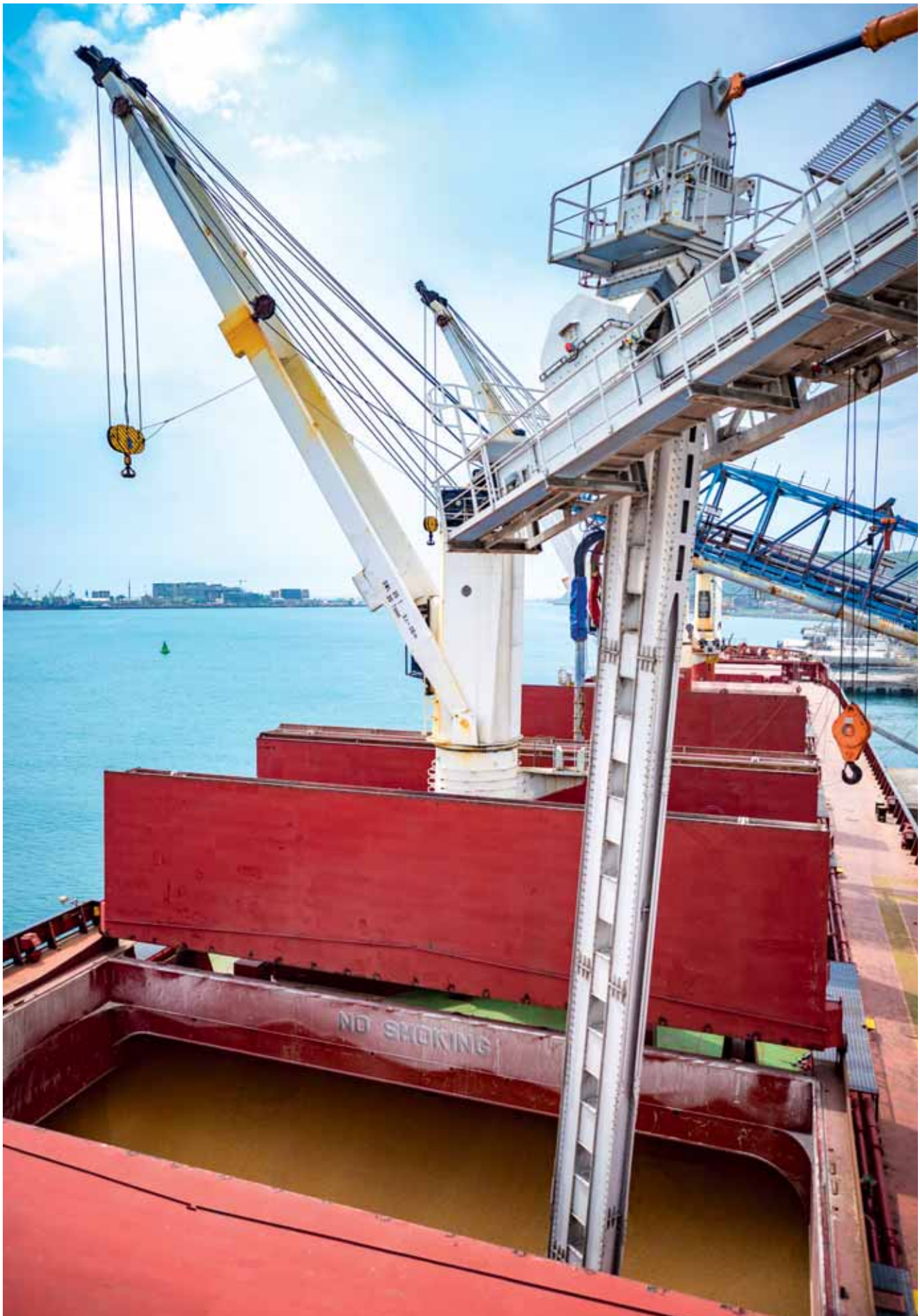
Recent CSU contracts and installations

- Bühler has sold one Portalink with the capacity of 800tph in Asia; and
- Bühler has installed two 400tph Portalinks in the Middle East.

General company background

Every day, billions of people come into contact with Bühler

technologies to cover their basic needs for foods and mobility. With its industrial process technologies and solutions, Bühler contributes significantly to feeding the world's population, setting the focus on food security and safety. The global production and processing of wheat, maize, rice, pasta, chocolate, and breakfast cereals relies strongly on Bühler equipment. Furthermore, the company is a leading solutions provider of die casting and surface coating technologies, with an emphasis on automotive and optics. As a leading technology group, every year Bühler invests up to 5% of its turnover in Research & Development. In 2015, its around 10,800 employees in over 140 countries generated a turnover of CHF 2.4 billion. The family-owned company Bühler is proud of its Swiss roots and feels particularly committed to sustainability. DCi



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Grain of truth?

Alex Stewart expertise ensures quality of grain cargoes

Grain and oilseed inspection and analysis are core businesses of Alex Stewart Agriculture Ltd. Alex Stewart is a superintendent and analyst member of the Grain and Feed Trade Association (GAFTA). Alex Stewart works with many leading grain traders by providing trustworthy professional inspection and laboratory services globally. In addition, ASA can arrange fumigation services in most areas of the world to ensure that its customers' cargoes are treated as with the greatest care. Upon nomination, Alex Stewart's mission is to protect customers' interests at loading and/or discharge ports worldwide. ASA is also able to provide collateral management services such as supervision of long term storage of grain or control of transportation between storage facilities.

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

Agricultural laboratories

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

Dry bulk commodities certified by Alex Stewart

Fertilizer

Alex Stewart Agriculture's highly experienced and knowledgeable inspection team has built a trusted reputation within the international fertilizer-trading arena. The fertilizer division offers first class inspection and analytical services for bulk, bagged and liquid fertilizer with the aim of protecting client's interests at production site, during transportation, or at store. ASA has fertilizer laboratories in the UK, Belgium, Ukraine, Russia, South Africa, China and India. Its offices in the UK, Belgium and the Ukraine are all members of the International Fertilizer Association.

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Sample preparation.

Animal feed

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

Grain and wheat

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

Quality inspection services

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

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

Key agricultural GAFTA/FOSFA superintendent operations within Alex Stewart Agriculture

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

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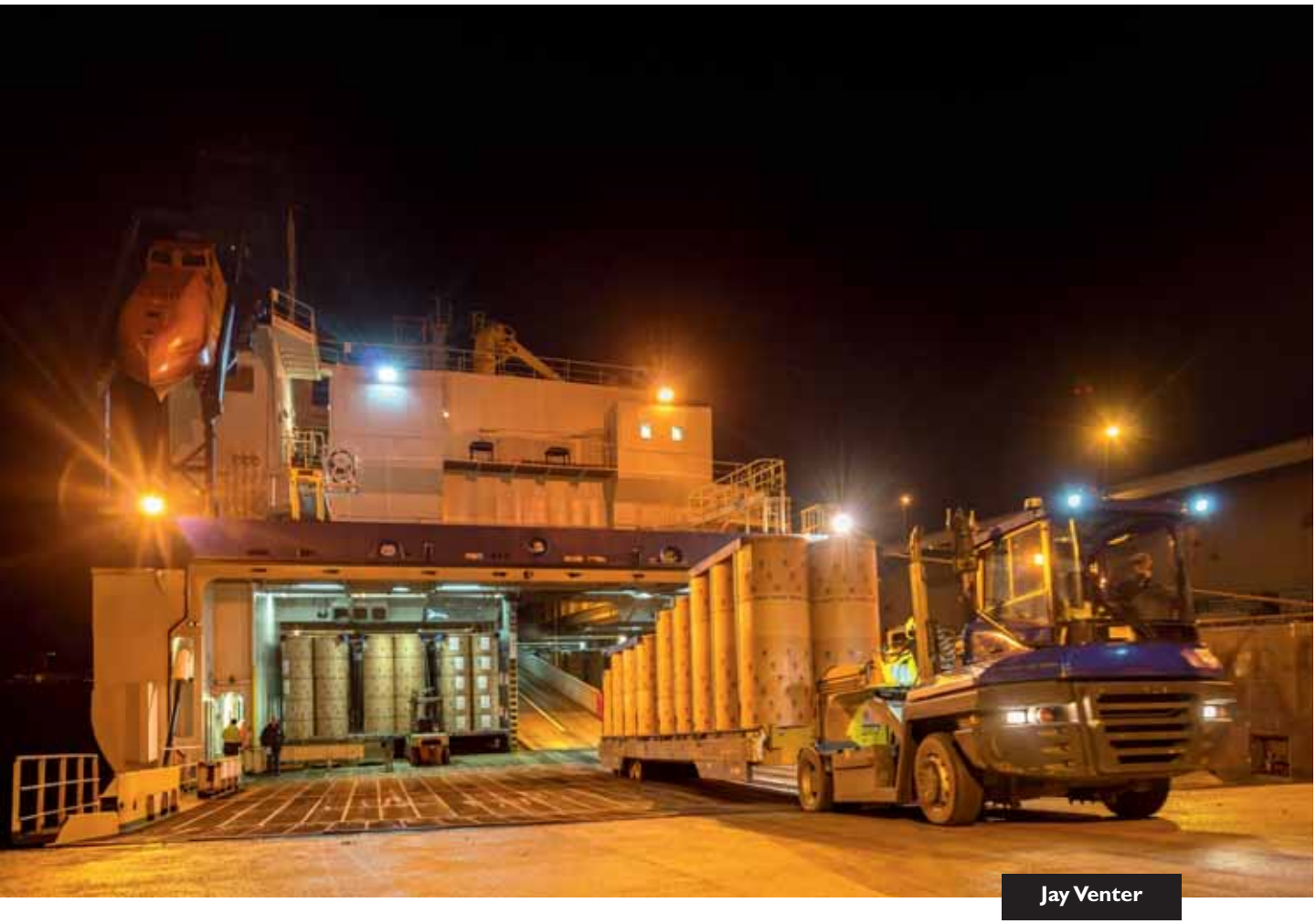


Jay Venter

Port of Kiel posts record cargo throughput

Forest products contribute to successful year at German port

The Port of Kiel in Germany has posted record cargo and passenger handling figures in 2016. For the first time some 6.5mt (million tonnes) were loaded or unloaded last year — an increase of 5.3% over the previous year and the port's best-ever result so far. Ferry services showed above-average growth, while trade with Russia continued to decline. Dr Dirk Claus, Managing Director of the Port of Kiel (Seehafen Kiel GmbH & Co. KG) comments: "Kiel has achieved a record result. Increases of as much as 7.6 % were posted at the public terminal facilities operated by the Port of Kiel." The port was able to win two important new customers in the past year — SCA and Iggesund Paperboard — and to open a new forest products terminal in the Ostuferhafen. "Investment in the paper business means we will continue to grow and can now set our sights on a 7mt handling figure", says Claus. "It is also of decisive importance that we have been able to expand the port's logistics competence," he added.

In the ferry sector, the Port of Kiel's main business, services to Scandinavia and the Baltic region showed above-average growth in 2016. By contrast, direct ferry services to Russia last year had to contend with trade restrictions between the EU and Russia for the third year in a row. They have already paid for that by losing big parts of their former business. Russian forest products however remain largely unaffected and continue to be imported in significant quantities and stored in two warehouses in the Ostuferhafen.

A total of more than 200,000 trucks, trailers and containers moved through Kiel last year on RoRo services to and from Scandinavia, the Baltic region and Russia, 5.5 % more than in the previous year.

SCA forest products centre opens in the Ostuferhafen

The new SCA forest products and logistics centre was officially opened in the Ostuferhafen on 11 November last year. The Swedish concerns SCA and Iggesund handled, stored and

distributed an initial 300,000 tonnes of high-grade paper products there last year. This year that will rise to about 800,000 tonnes. Claus comments: "The paper products project adds a further mainstay to the Port of Kiel structure. The settlement of SCA means that one of the most important trading commodities in the Baltic region has now come back to the Kiel Fiord." The new SCA terminal was built on a site of well over 16 hectares in the northern part of the Ostuferhafen. More than 50,000m² of storage space is now available there in five port warehouses. A total of €25 million have been invested and 80 new jobs created.

SCA cargo vessels arrive in the Ostuferhafen every Monday and Saturday from Sundsvall (Sweden) and offload up to 160 cassettes of paper products. They range from cellulose through newsprint to kraft liners and cartonnage products for high-quality packaging — all destined for the German and European markets. In addition overseas containers are packed for shipment out of Hamburg to the Far East.

Hinterland rail services grow by 4%

Rail/ship intermodal transport volumes continued to grow in the year just ended. For the first time, more than 29,000 trailers and containers were loaded onto rail wagons at the rail terminals on Kiel's Schwedenkai and in the Ostuferhafen — a rise of 4%. The biggest increase was posted by the service to and from Verona, which operates five times a week in both directions. A further departure is being added in early February. "Seaport hinterland transport by rail is a success story," says Dirk Claus. "To ensure that this remains the case, the performance capability of the port's intermodal terminals is being further increased. Kiel will in future also be in a position to handle significantly longer train combinations," he declares. As part of a programme to improve seaport hinterland transport, the German government recently agreed to adapt the Kiel-Meimersdorf marshalling yards to cope with goods train combinations of up to 740m in length — compared with 550m currently. The work will be carried out in 2018 and is absolutely essential for the port. As early as this year, the marshalling area at the Schwedenkai Terminal is meanwhile getting an additional rail track to optimize train movement and make more loading slots available.

About the Port of Kiel

The Port of Kiel is one of the most versatile and economic ports on the Baltic Sea. Its advantageous geographic location, constant deep water for seagoing vessels as well as its direct links to train and road networks make it attractive for both cargo handling and passenger traffic. There are daily ferry services to Oslo (Norway) and Gothenburg (Sweden) from Kiel's inner harbour and seven departures a week from the Ostuferhafen to Klaipeda (Lithuania) as well as one weekly departure to both St. Petersburg and Ust-Luga (Russia). The Port of Kiel (Seehafen Kiel GmbH & Co. KG) operates the commercial harbour Kiel on behalf of the state capital of Kiel.

Leading manufacturer of precast concrete parts opts for handling machine from Terex Port Solutions

Since summer 2016, Consolis Malaysia has operated a Terex® reachstacker equipped with a special grab for handling and transporting concrete pipes and components at its plant in Port Dickson, Malaysia.

Consolis uses Terex® reach stacker at its plant in Malaysia

Reachstackers from Terex Port Solutions (TPS) stand up beyond container terminals. Consolis Malaysia, a subsidiary of the Consolis Group, a leader in precast concrete solutions and headquartered in France, has used a Terex® TFC 45 R reachstacker at its plant in Port Dickson, Malaysia since summer 2016. Consolis Malaysia uses the robust machine for handling and transporting concrete pipes and components produced on site for the construction of a water-cooling circuit.

High flexibility of use thanks to specially developed grab

The Terex reachstacker used by Consolis Malaysia is equipped with a grab developed especially for pipe components. Guillaume Beduneau, Operation Manager at Consolis in Malaysia, explains: "With the Terex reachstacker we can selectively grab and position the components. In this way we achieve greater flexibility of use than with other handling machines such as mobile cranes. So far the machine has also impressed us in everyday work with its robustness and cost-effective operation."

Not just for containers: adapting for project cargo

Paolo Dazi, Global Sales Director Lift Trucks TPS, is delighted to have gained Consolis as another industrial customer for the reach stacker technology of TPS: "The fact that Consolis has opted for the TFC 45 R proves the versatility of our reachstackers. Besides container spreaders, we can also equip them with the appropriate lifting gear for various industrial applications. In addition, Consolis benefits from the advantages typical of all our reachstackers, namely cost-effectiveness, serviceability and ergonomic design."

Complete reachstacker model range

TPS offers customers an extensive range of reach stackers. The Terex TFC 45 R belongs to the portfolio of proven machines that has been extended since spring 2015 to include the Terex Liftace™ reachstackers from the new-generation lift trucks of TPS. TPS completed the Liftace portfolio mid-year, which now consists of five models with wheelbases of 6,200mm to 7,000mm. Says Dazi: "Taken together, there is now a model range available to customers, in which container terminals can find the right reachstacker just as easily as multimodal terminals or industrial companies."

About Terex Port Solutions

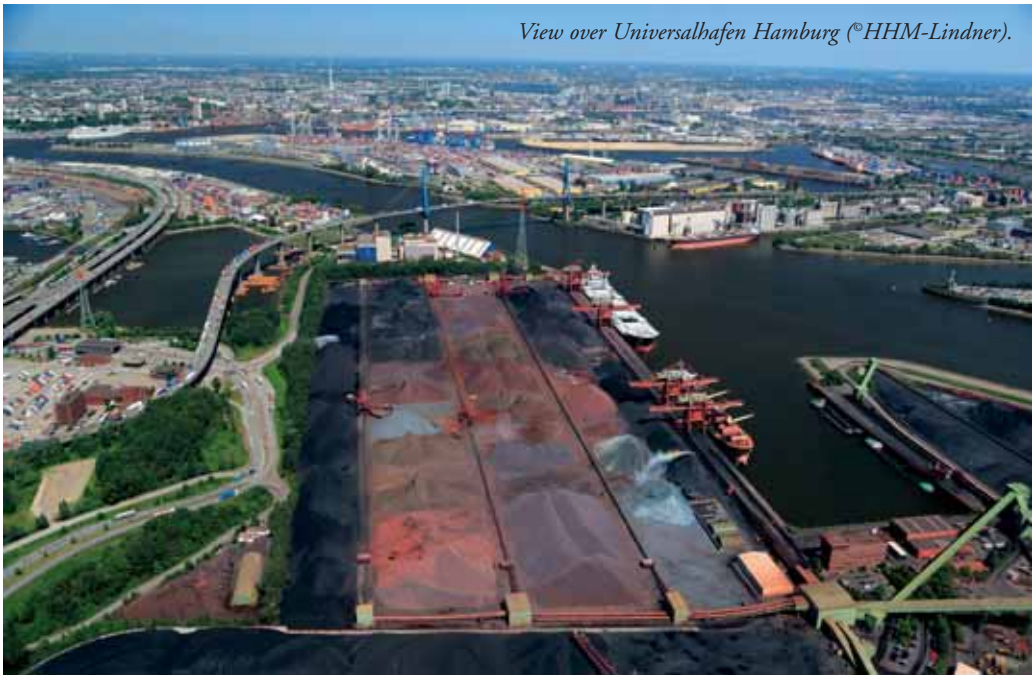
Terex Port Solutions is part of the Material Handling & Port Solutions business segment of Terex Corporation that supplies customers in ports with a unique combination of machines, software and services under the Terex and Terex Gottwald brands. Whether it is ship-to-shore cranes, reach stackers or fully automated, integrated handling systems for containers and bulk, Terex Port Solutions provides reliable solutions for rapid, safe, efficient handling of all forms of cargo with low downtimes and excellent return on investment.

About Terex

Terex Corporation is a global manufacturer of lifting and material processing products and services delivering lifecycle solutions that maximize customer return on investment. Combined with diverse services, Terex offers life-cycle solutions that afford its customers the highest return on investment. Major Terex brands include Terex, Genie, Powerscreen and Demag.

Terex solutions serve a broad range of industries, including construction, infrastructure, manufacturing, shipping, transportation, refining, energy, utilities, quarrying and mining. Terex offers financial products and services to assist in the acquisition of Terex equipment through Terex Financial Services.

Port of Hamburg growth up slightly



View over Universalhafen Hamburg (©HHM-Lindner).

Ore handling at Hansaport (©HHM-Krueger).

THROUGHPUT VOLUME GROWTH OF 0.3% IN THE FIRST THREE QUARTERS OF 2016/SEAPORT-HINTERLAND RAIL TRANSPORT ACHIEVES 3.1% ADVANCE

At 104.9mt (million tonnes), total seaborne cargo throughput at the Port of Hamburg for the first three quarters of 2016, covering general and bulk cargo segments, was 0.3% up on the previous year. "Seaborne cargo throughput in the Port of Hamburg has stabilized and for the first three quarters of 2016 again increased. Seen separately, the third quarter with a 2.7% upturn to 34.7mt underlines the upwards trend. Both general and bulk cargo volumes developed positively for Germany's largest universal port," said Axel Mattern, Joint CEO of Port of Hamburg Marketing. The successful trend for seaport-hinterland rail transport was also maintained. "By comparison with other leading European ports, in the first three quarters of 2016 Hamburg further expanded freight volumes transported by rail. Transporting 35.5mt of freight and 1.8 million TEU, representing gains of 3.1% and 1.9%, rail once again achieved a substantial advance," reported Ingo Egloff, Joint CEO of Port of Hamburg Marketing. In the first nine months of the year container throughput as a whole remained almost at the previous year's level. Whereas containerized cargo volume advanced 0.4% to 69.3mt, at 6.7 million TEU the number of boxes handled was down just 0.1%, or almost unchanged. The container traffic with Asia that is especially important for the Port of Hamburg grew by 1%. Predominating in the Port of Hamburg, container throughput with Chinese ports also thrived. This attained a 0.6% increase. Container services in the North & South America trades produced overall growth of 1.2%. In the European container trade, results differed. On the one hand, a satisfactory of 4.4% advance to 337,000 TEU in container traffic with Russia signalled a slight upward trend. On the other hand, direct calls by container liner services in Gothenburg and Gdansk caused downturns of 15.4 and 14.1% in seaborne container traffic with Sweden and Poland, respectively. Declining by 1.7%, the European trade as a whole was still slightly negative. A continuing rise in the significance of India was more gratifying. With throughout 6.8% ahead at 188,000 TEU, the country now ranks eighth among Hamburg's top trading partners in container traffic. Positive trends here also produced growth of 18.0% with Mexico, 7.7% with the USA, 12.1% with United Arab Emirates and 13.3% with the United Kingdom. "For the first three quarters of the year the Port of Hamburg's container throughput statistics indicated 0.5% growth to 3.5 million TEU in import boxes.

Exports reached 3.2 million TEU, remaining 0.6% below the previous year's figure. Despite the increase in import containers and an overall 0.5% advance for loaded containers, reaching 5.7 million TEU in the first three quarters, a very slight 0.1% downturn occurred in the Port of Hamburg's overall throughput figure. That is primarily attributable to fewer transshipment services with ports in Poland and Sweden," explained Mattern.

Bulk cargo throughput

Bulk cargo throughput in Hamburg for the first nine months of 2016 was 0.3% up at 34.5mt, with import and export trends again differing. Imports during the first three quarters were 6.7% up at 25.7mt. On the export side, bulk cargo throughput at 8.7mt remained 14.8% below the previous year's. Both a 14.1% advance to 3.2mt for suction cargoes — grain and oilseeds — and one of 14% to 8mt for the liquid cargo segment, especially oil products, ensured growth in imports. Grab cargo throughput, mainly of coal and ore, also grew, being 1.5% higher at 14.6mt. There were various reasons for the 8.7mt or 14.8% fall in exports in the suction/liquid/grab cargo segment. Apart from the harvest-related downturn in grain exports, down by 21.9% or 2.7mt in the first half, and far weaker than in the especially strong previous year, oil product exports at 2.5mt were also 26.5% down. Poor throughput can primarily be explained by the closure of a major Hamburg refinery and cessation of its oil product exports.

The grab cargo segment almost reached the figure for the comparable period of the previous year, with the total just 0.6% lower at 2.6mt. In the first three quarters non-containerized general cargo throughput, of outsize plant elements and wheeled cargo for instance, was 9.5% down on the previous year at 1.2mt. On the import side, with the total 2.2% down at 419,000 tonnes, growing throughput figures for imports of timber, project cargo and oleaginous fruits failed to offset downturns for paper, metal and vehicles. On despatch of conventional general cargoes, reported as being 13% lower at 776,000 tonnes, growth for timber, iron and steel failed to compensate for lower vehicle exports.

Cargo stabilizes

Ingo Egloff and Axel Mattern, Port of Hamburg Marketing's two joint CEOs, revealed at the port's quarterly press conference that the universal port of Hamburg's seaborne cargo throughput has stabilized, with an upward trend discernible. In stiff competition with the main ports of Northern Europe, Hamburg can report an outstanding trend on seaport-hinterland services. Against the general rail freight tendency for declining volumes, the quantity of freight shifted in and out of the Port of Hamburg by rail increased by 3.1%.

The total number of containers transported by rail during the first nine months climbed by almost two% to 1.8 million TEU. More than 200 freight trains daily reach or leave Hamburg as Europe's largest rail port, connecting it with all economically active inland regions. Hamburg's very numerous connections and intense frequency of train departures are advantageous for rapid handling of export and import freight for inland shippers. "If the port is to continue to be expanded and remain competitive in its numerous functional areas, apart from the development of high-performance access and dispersal corridors for freight transport by rail, truck and inland waterway craft, dredging of the navigation channel on the Lower and Outer Elbe remains essential for enduring growth and employment," said Egloff. The Port of Hamburg is Germany's largest universal port, guaranteeing more than 156,000 jobs in the Hamburg Metropolitan Region. The port is also a significant industrial location, its total added value of 21.8 billion euros being of immense importance for the entire German national economy. For 2016, the Port of Hamburg's marketing organization is reckoning with total seaborne cargo throughput at last year's level of the order of around 138mt and container throughput of almost 9 million TEU.

On course

Ports are an economic factor for key industries. (Photo: ContiTech)

Ports play a key role as important transshipment hubs for a variety of goods and wares. They are complex, high-performance centres and a key economic factor all over the world. In this busy environment, the international technology company Continental is doing its bit to ensure that operations run smoothly.

The giant quay cranes and ground conveyors designed for loading and unloading ships in ports are powerhouses of almost limitless capabilities. Wireless signals allow the crane operators to locate the assigned bays for goods from all over the world. Everything works fully automatically. In tandem operation, the LHM 600 Litronic from Liebherr — a mobile dockside crane for heavy goods and project cargoes — can load up to 320 metric tonnes of general cargo. Continental supplies the hydraulic lines for these giants to ensure smooth operation. The dockside cranes move very slowly and avoid tight curves. Continental offers a range of special tyres for these mobile colossi. The CraneMaster tyres can support extremely heavy loads and, thanks to their low rolling resistance and, in turn, lower energy consumption, meet the stringent demands of these vehicles. Meanwhile, Continental's drive solutions ensure maintenance-free, low-wear system solutions for lifting systems and ground conveyors. As alternatives to chain drives, polyurethane flat belts featuring ultra-high-strength steel cord tensile members are ideal for a host of challenging applications.

Smooth port logistics

For forklift trucks, too, companies are deploying other products developed by the technology corporation. Axle boxes help to cushion the front axles, ensuring that the chassis runs quietly. For the Linde electric stacker 386, two special axle boxes made from natural rubber were also developed. These take up very little space and ensure mobility when the lift pole is tilted. The boxes absorb the three-dimensional loads generated when the stacker is in operation as follows: the load from the lift pole is absorbed vertically, while the load generated when the stacker is in motion is absorbed horizontally. In addition, the noise emissions from the forklift truck are permanently reduced. Continental also offers the special TractorMaster tyre for port logistics. This product has been specially designed for tractor units deployed for handling operations in port terminals and forwarding agent's yards. These tyres allow large and heavy loads to be transported — and all that with uniform wear to prevent the tread from tearing. The tyre is highly damage-resistant, has extremely low wear, and helps to cut not only fuel consumption but also CO_2 emissions. And with StraddleMaster, ContainerMaster, DockMaster, and Continental CraneMaster, the highly resistant V.ply tyres for port fleets also help to ensure smooth operations in port environments.

In the trucks that unload the containers from the ships for onward transportation, air springs featuring lightweight plastic pistons save weight and fuel — for example, in the Mercedes-Benz Actros. Continental also develops sleeve air springs that gently cushion the driver's cab. The interior of the driver's cab contains a number of components developed by Benecke-Kaliko: covers in Acella for the different seat versions and Yorn foam laminate for the spacious stowage compartments.

Bunker hoses are used for conveying heavy fuel oil, carburettor fuels, and hot asphalt to and from the ships. Whether in Hamburg, Rotterdam, Antwerp, or Batumi, Georgia, these highly resistant hoses from Continental are essential for conveying these substances either onto dry land or onto the

In the Batumi terminal in Georgia, highly resistant bunkering hoses from Continental transport fuel oil, carburettor fuels, and hot asphalt to and from the ships. *Photo: ContiTech*

The Mercedes-Benz Actros features a range of technical, fuel-saving innovations, including various sophisticated products from ContiTech. *Photo: ContiTech*

ships. When in operation, they have to be absolutely safe and reliable in order to avoid environmental damage. Decades of knowhow in the production of hybrid hoses lead to ever-improving product quality. And what's more, when iron ore or coal in Rotterdam, Hamburg, or Narvik in Norway needs to be extinguished, oil-resistant and fire-retardant, energy-optimized covers from Continental ensure problem-free unloading to the designated bays — highly efficient and energy-saving.

Port construction work

Continental has a role to play in the construction of new ports, too. Floating hoses developed by Continental were used during the construction of JadeWeserPort, Germany's only deepwater port. Special-purpose hoses were used for shifting twelve million cubic metres of sand from the dredgers. Continental also offers a range of high-quality, special-purpose hoses for transporting concrete to container terminals under construction. Whether port deepening on the coast, river deepening for inland water transportation, or land reclamation for expanding terminals, dredging companies count on Continental — in Hamburg, Bremen, and any other port where, among other things, the waterways require regular clearing. For these tasks, companies need highly wear-resistant hoses that are not only durable and highly flexible, but also meet individual customer requirements. Safety is the watchword here. The floating hoses are designed to withstand three times the pressure stipulated in the planning data. The floater dredges deployed to perform such tasks are also equipped with conical mounts from Continental to ensure the required stability. These components continuously compensate for the movements and shifts in weight that occur as a result of the extreme stresses. Installed on the ring mount in the dredger, the mount ensures that the water engineering vehicle always stays on course during construction operations.

Continental develops intelligent technologies for transporting people and their goods. As a reliable partner, the international automotive supplier, tyre manufacturer, and industrial partner provides sustainable, safe, comfortable, individual, and affordable solutions. In 2016, the corporation generated preliminary sales of €40.5 billion with its five divisions, Chassis & Safety, Interior, Powertrain, Tires, and ContiTech. Continental currently employs more than 220,000 people in 55 countries.

As a division in the Continental Corporation, ContiTech is one of the world's leading industrial specialists. Its customers can be found in key industries such as machine and plant engineering, mining, the agricultural industry, and the automotive industry. With around 43,000 employees in 44 countries, the company uses its development and material expertise for products and systems made of rubber, plastic, metal, textile, and electronic components to combine these with individual services. ContiTech always thinks in terms of customer-friendly and environmentally-friendly solutions — going well and truly beyond its roots as a producer of rubber products. With sales of €5.4 billion (2015), this international technology partner is active with core branches in Europe, Asia, NAFTA, and South America.

The special TractorMaster tyre has been custom-designed for tractor units deployed for handling operations in port terminals and forwarding agent's yards. *Photo: Continental*





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Dust- and spill-free handling with Orts GmbH grabs

German manufacturer Orts GmbH produces a complete range of bulk-handling grabs for operators using mechanical-rope, electro-hydraulic and radio controlled diesel-hydraulic equipment in either orange-peel or two-clamshell designs.

The grabs from ORTS are mainly in operation on board of bulk carriers, but stevedore companies also favour the productivity and reliability of ORTS grabs, which are all 'Made in Germany'.

For the last 40 years ORTS has been known for its quality grabs. With their unique construction design they ensure a high closing force also in heavy bulk cargo and a good relation between grab dead weight and clamshell size.

ORTS was the first grab maker with the radio-controlled diesel-hydraulic grabs, which have been produced for more than 20 years. In 2016, the biggest radio controlled diesel-hydraulic orange-peel grab with 12m³ volume was delivered to a customer in Middle East.

EHS-B 20m³ electro-hydraulic grab.

Other diesel-hydraulic grabs were shipped recently to Australia, Africa, Japan, China and Great Britain.

The ORTS electro-hydraulic grabs are the best choice for bulk carriers to be competitive in discharge time and reliability. They cover a wide range of different dry bulk cargo types. Some shipping companies have had ORTS grabs on-board for as long as 30 years, and they are consistently returning to fit their newbuildings again with ORTS grabs.

"The reliability of the grab is important when discussing productivity. It is pointless to buy a cheap grab, if it then breaks down during vessel handling, effectively prolonging the length of the port call. T he grade of filling is also crucial; the better the grade of filling of the grab, the shorter the loading/discharge time," stresses Orts.

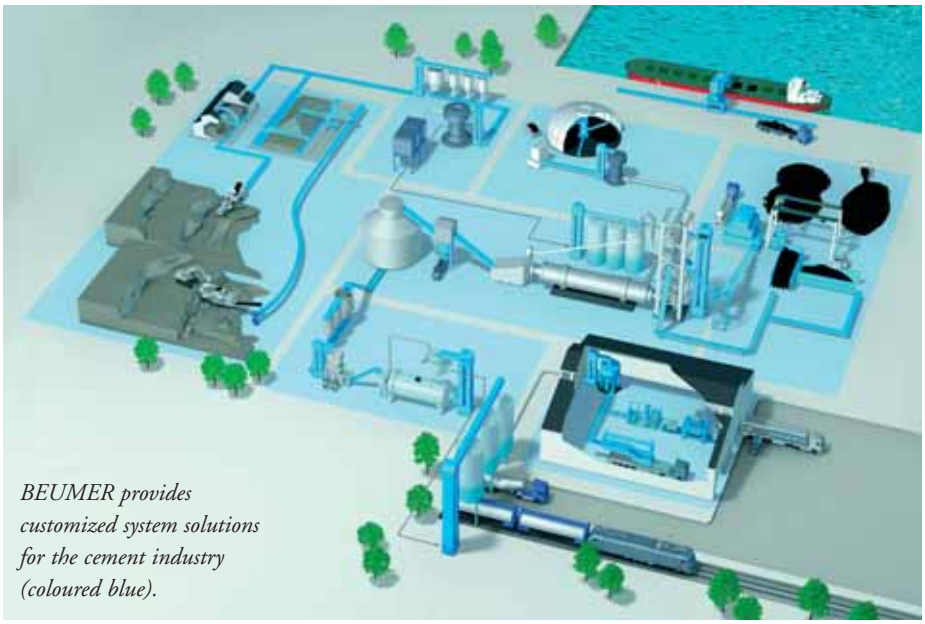
Challenged to define the exact role grabs play in the dry bulk industry, he points out that not all bulk materials can be handled with a vacuum, screw or belt unloader. Indeed, if the on-board load becomes compressed, as can happen during heavy seas, belt or vacuum unloaders can struggle to cope.

While other bulk discharge equipment manufacturers stress their ability to contain dust emissions, Orts GmbH developed a 100% covered grab already in the 1980s, specifically to address environmental concerns.

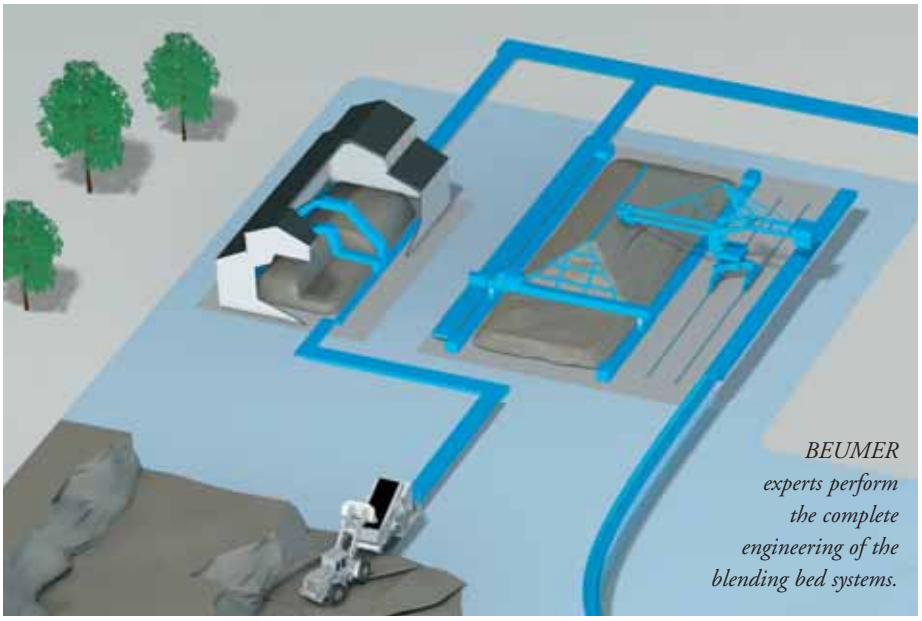
The most dust emissions are made when discharging dry bulk consignments into hoppers. ORTS has a partner which can provide and offer 'no dust' hoppers and is happy that a kind of package can be offered to customers that need grabs and hoppers without spillage and dust.

DHM 12m³ diesel-hydraulic grab.

BEUMER develops blending beds for different bulk goods: relying on regularity



BEUMER provides customized system solutions for the cement industry (coloured blue).



BEUMER experts perform the complete engineering of the blending bed systems.

In many industrial processes — for example, in the cement industry — the regularity of the raw materials used plays an important role in the manufacture of products. This uniform consistency is ensured through blending beds located within the storage yard. As a system supplier, BEUMER Group develops stackers and bridge scrapers, the essential components of blending beds, which stack bulk material reliably and guarantee a maximum blending effect. Thus, operators can homogenize large quantities of various bulk materials dependably and efficiently. BEUMER employees can perform the complete engineering of the blending bed systems.

Be it houses, bridges or tunnels: cement is the material that holds everything together. However, a bag of this material has already come a long way before it arrives at the building site. When the component raw materials are mined and transformed into cement at the cement plant, they pass through many different stages. The most important raw materials for cement production are limestone, clay and marl. Workers break them out of quarries or extract them with heavy tools. Wheel loaders and dump trucks transport the raw materials to the crushing facilities. There, the rocks are crushed to the approximate size of road gravel. These rocks then arrive at the cement works via miles long belt conveyors.

A consistent quality must be ensured so that the producers can further process the material to high-quality cement — fluctuations in the material characteristics must not occur. Therefore, a belt conveyor transports the individual raw materials to the blending beds. These storage location systems mix and homogenize the raw materials.

Experts at work

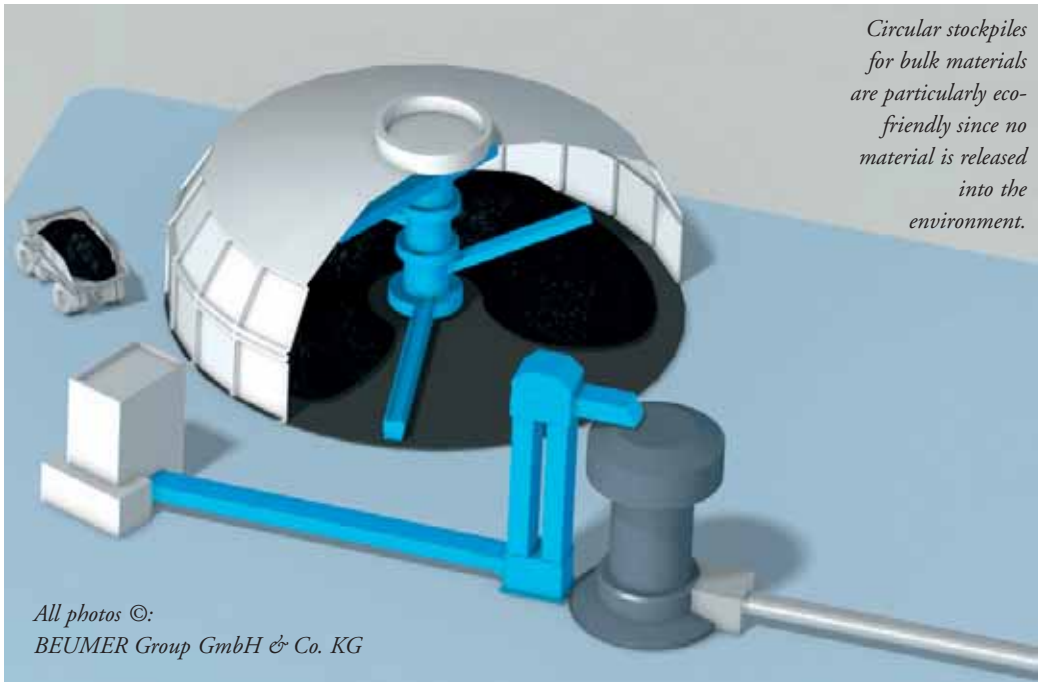
For almost 80 years, BEUMER has been developing tailor-made system solutions in conveying technology for the stone and quarry industry, power plant industry, mining (ores and coal) as well as the logistics industry (harbours and transshipment terminals). Furthermore, the specialists have comprehensive expertise in engineering of blending beds and stockpiles. Through structural analysis of the associated storage depots and calculation of dimensions, BEUMER is able to provide a design. The blending beds are customized according to their requirements. BEUMER proposes either longitudinal or circular stockpile designs. The recommended design shape results from the spatial conditions and the amount of the material to be stored. Depending on the field of application, BEUMER-designed blending beds can be used at extreme ambient temperatures, for very high entry conveying capacities, as well as for the highest degree of homogenisation required. Additionally, BEUMER provides material-specific detailed solutions with robust and low-wear equipment. The environmental impacts are also very low as minimal noise and dust occurs during operation. Blending beds can be set up both outdoors and indoors.

Compiled and extracted in layers

The stacker and the bridge scraper are the basis for a blending bed. If they are perfectly designed, the user will obtain an optimum blending effect. BEUMER offers stackers that stack the bulk material efficiently and effectively. In the end, the stockpile has been raised so reliably that its cross-section shows as many layers of equal material as possible. The stackers can be of fixed or mobile types, depending on the requirement. In case of circular stockpiles the stackers are mounted onto a column and with a longitudinal blending bed, they are mounted on rails. The stackers are designed as fixed, raisable and pivotable booms with conveying capacities of up to 4,000tph (tonnes per hour). The choice of the right system depends on different factors, as for example, the shape and size of the stockpile, the material, the

throughput and the desired mobility.

Lastly, the bridge scraper homogenizes the material. It has a mobile rake on each side. The material is removed in layers by stroking the face of the stockpile with the rake. The scraper blades move the bulk material towards the belt conveyor which runs parallel to the stockpile. BEUMER bridge scrapers are not only robust, but they also transport the bulk material so that the product is handled gently. This makes them suitable for a variety of bulk materials. Their continuous and comparably simple working motions allow for a fully automated operation and ensure a constant and steady flow of the bulk material.



Circular stockpiles for bulk materials are particularly eco-friendly since no material is released into the environment.

All photos ©: BEUMER Group GmbH & Co. KG

In the past, the new BEUMER team has completed remarkable projects in this field. One such example is an installation of a bridge scraper in Russia, which works at an ambient temperature as low as –40°C. The rail width is 34 metres and this bridge scraper is designed for a conveying capacity of 500tph. Furthermore, BEUMER has developed a stacker for coal mining, which is operated at ambient temperatures of –20°C. This boom has a length of 41 metres and the belt width measures 1.6 metres. It transports 2,250 tonnes of bulk material per hour. BEUMER also engineered a bridge scraper with a rail width of 55 metres that conveys 1,100 tonnes of coal per hour.

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

Flows of goods for over 100 years: SENNEBOGEN 875 unloads coal at Murmansk

Around 4,800 tonnes of coal arrive at Murmansk port by railcar every day. They are unloaded by a SENNEBOGEN 875 with crawler portal undercarriage and 5m³ double shell grab.

Ports are lynchpins of the modern economy. They connect countries and companies with each other. In the Russian city of Murmansk, tonnes of Siberian coal leave the port every day. The material is handled and loaded with a SENNEBOGEN 875 material handler.

In 2016 the largest city in the Arctic is celebrating its 100th anniversary. Named 'Romanow-na-Murmana' in 1916 after the Russian czar, the 'Cape Town of the North' is now known by the name of Murmansk. Located in a bay of the Arctic Ocean, the city has always been shaped by the port. This has actually existed for one year longer than the city of the same name and was thus the origin of the economic growth of the region.

Efficient material handling with a portal undercarriage and a 24 m range

In the Port of Murmansk, which extends for several kilometres along Kola Bay, mainly coal is handled on a large scale, in addition to single items, bulk goods, and containers. Up to 500 cars bring coal from the mining areas in Siberia via rail to the Port of Murmansk. With the modern handling technology of SENNEBOGEN, the railcars are unloaded there, and the coal is stored in large stocks to be loaded on ships later. Equipped with a crawler portal undercarriage, the SENNEBOGEN 875 stands directly over the rails, in order to remove the coal with the 5m³ double shell grab. Thanks to a track width of 5.80m and a passage height of 5m, the undercarriage spans one of the two railway lines but can comfortably serve both railway lines at the same time, one directly underneath the machine and one parallel to it. In addition, the diesel-driven material handler has a range of 24 m and alternately unloads the railcars on the right and left in a continuous cycle.

Operators of the machine agree: "The view from the elevated Mastercab comfort cab is perfect. In addition, cameras and LED headlights help provide optimum visibility even in bad weather

conditions. Thanks to the powerful slewing drive with up to five revolutions per minute, we manage an unloading cycle in under 30 seconds — that is our fastest time!"

The machines that the responsible sales and service partner JSC KWINTMADI delivered in mid-2015 have a 395kW diesel engine and the proven Green Hybrid energy recovery system. The 875 was optimized with a low temperature package for use at Arctic temperatures. This includes numerous preheating mechanisms for the equipment and the Green Hybrid system, as well as special lubricants for temperatures down to minus 35°C.

For the employees of Murmansk Commercial Seaport, the reliability and availability of the SENNEBOGEN machines are paramount. With modern handling technology, they are equipped for the challenges of the increasing goods handling. In addition to the 875 with crawler portal, several SENNEBOGEN 830 and 835 material handlers are also in use in the port area. These load and transport all kinds of bulk goods. The competent service and regular maintenance by KwintMadi, which is represented by a branch in Murmansk, ensure maximum availability and guarantee a long service life for the machines.

Port Material Handling

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Conveying & Loading Systems: BEUMER develops and implements complex system solutions for bulk materials

A powerful global partner

The BEUMER Group uses its newly created Conveying & Loading Systems (CL Systems) division to develop and implement complex system solutions throughout the world for different industries, such as mining and the cement industry. The team is made up of experienced staff from the branches distributed around the world who work together on the projects. What they all have in common is that they understand the user, which means that they can develop tailor-made solutions. This is demonstrated by three impressive completed projects.

Dr Andreas Echelmeyer, who has headed the Conveying and Loading Systems division in the BEUMER Group at its headquarters in Beckum since August 2015, stated that "We can use our comprehensive expertise in system solutions to advise our customers and provide them with complete plant systems. Each industry poses its own unique challenges." The most important point is to listen carefully to the customer and then ask the right questions. This can only be done locally. Employees positioned around the world are therefore in close contact with the customer. They are familiar with the specific customs of the particular country, understand the language and are wise to the particular requirements of the market and the customer. They identify appropriate potential and any possible need for action. The operators for which BEUMER has successfully commissioned conveying plants includes the TPI Polene Public Company Ltd. The third-largest cement producer in Thailand uses this complex system solution to transport crushed limestone from the quarry to the blending bed.

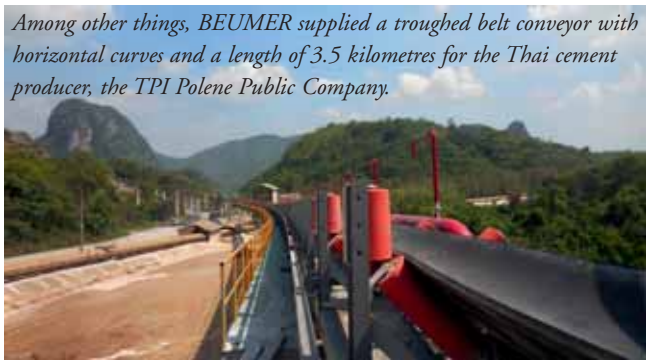
Difficult environment safely overcome

Echelmeyer was aware that, "The challenge lay in the nature of the ground between the quarry and the cement plant." It was exceptionally demanding. We had to make allowances not only for numerous obstacles but also for a steep downhill section of the conveyor." The team designed a complex, but above all cost-effective, integrated system comprising a total of eight belt conveyors covering a distance of 6,129 metres. BEUMER also supplied a PLC plant control system, transfer stations, filter systems and foreign body collectors.

The system is designed for a conveying capacity of 2,200tph (tonnes per hour). The key items in the limestone transport system are two downhill belt conveyors operating in the generator mode followed by a troughed belt conveyor with horizontal curves. The material passes from the crusher discharge belt the first two troughed belt conveyors. The material is then transferred to a long overland conveyor with a speed of 4.5 metres per second by an accelerator belt with a speed of 2.6 metres per second. Three more conveyors finally transport the material to the blending bed.

Cost-effective operation guaranteed

One particular feature of the downhill conveyors is their power generation. With a total of 640kW/h generated energy that is fed into the power grid they make a substantial contribution to the cost-effective operation of the overall system. "We have a great deal of experience with conveying systems that can negotiate horizontal and vertical curves and operate in the generator mode," explained Echelmeyer. During the development it was necessary, for example, to ensure safe and carefully controlled stopping of the large belt system to avoid problems during unavoidable events, such as a power failure.



Among other things, BEUMER supplied a troughed belt conveyor with horizontal curves and a length of 3.5 kilometres for the Thai cement producer, the TPI Polene Public Company.

Transfer tower in the feed area.

Picture credits: BEUMER Group GmbH & Co. KG

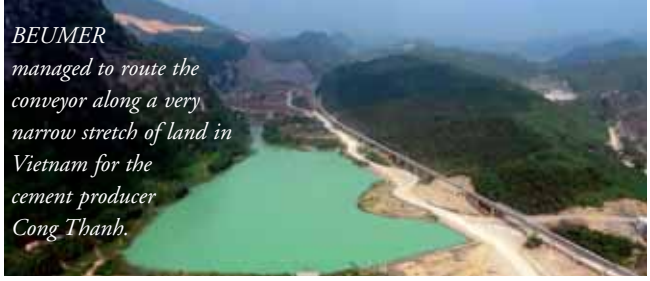
BEUMER supplied four further belt systems with a total length of 989 metres to deal with the discharge from the blending bed and supply the material to the raw mill feed hopper. The conveyors were all built and installed in only eleven months. The commissioning phase, lasting three months, was followed by performance tests. The team then handed over the entire plant to the customer. Echelmeyer emphasized that, "We supervised and monitored the installation and commissioning to ensure long-lasting, trouble-free, operation. This always forms part of our service." The standard scope of supply also includes intensive training of the operating and maintenance personnel.

Complex and curved

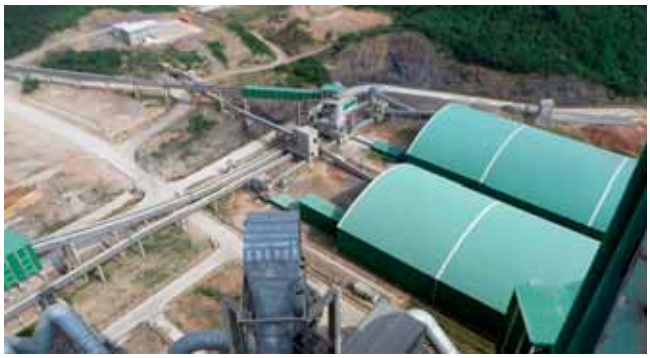
Cong Thanh, the Vietnamese cement producer, also relies on the system solution expertise of the BEUMER Group for transporting crushed limestone from the quarry to the blending bed. The CL team discussed the various technical options intensively in a joint workshop held with the producer. Various routes were worked out and compared on the basis of the narrow terrain that was available. Echelmeyer explained that "We have appropriate software for this, with which we can match satellite and aerial photographs with topographical data." One conveyor section that drops steeply in some places with numerous obstacles in the terrain and seven road crossings was particularly challenging.

A total system consisting of four conveyors with a combined length of 3.5km is now in use, BEUMER also supplied a PLC plant control system. The main component is an overland conveyor with three horizontal curves and a total drive rating of 600kW. It is designed for a continuous conveying capacity of 2,200tph.

The heaped material is transported in trucks from the quarry face to the crusher. The limestone that has been pre-crushed to



BEUMER managed to route the conveyor along a very narrow stretch of land in Vietnam for the cement producer Cong Thanh.



Transfer situation before the blending bed.

The route of the overland conveyor for the end customer, Cemindo Gemilang, passes through the middle of the rain forest.

Achmed Ammoura, chief erector in the BEUMER Group, at the belt conveyor with horizontal curves.

less than 100 millimetres is then transferred by discharge conveyors to an accelerator belt that feeds the long belt conveyor.

The troughed belt conveyor for downhill transport is one meter wide, with a distance between centres of 3,200 metres, and drops 70 metres. The conveying speed is 4.5 metres per second. The low operating costs are a special feature. Due to the downhill section the operation of the fully loaded conveyor is virtually energy-neutral. Its consumption during continuous operation is less than 200 kilowatts, which means that not even 0.1 kilowatt is required per tonne of transported material. According to Echelmeyer, "This, together with the low maintenance and repair costs, contributes substantially towards cost-effective operation." After the installation and commissioning his team submitted the plant to a performance test that it passed successfully on all points.

Through the middle of the rainforest

The CL Systems division of the BEUMER Group has also been very successful in Indonesia. The plant construction company Sinoma International Engineering Co. Ltd. was awarded the contract by the Indonesian end customer, Cemindo Gemilang, to supply a turnkey cement plant to Java. It should reach a daily clinker production of 10,000 tonnes. Sinoma commissioned BEUMER with the design and supply of an overland conveyor between the quarry and the plant.

The challenges in this project were not only the demanding topographical routing but also the evergreen rainforest. Joint discussions were held between the BEUMER team, Sinoma and the end customer. The team worked various routes out and compared them. "The very narrow corridor of land in addition to the tropical climate required a complex and sophisticated design," explained Echelmeyer. Among other things his team designed a solution with tight horizontal curves that fitted optimally into the landscape.

The entire system now comprises six conveying plants with a total of length of 7.6 kilometres. BEUMER also supplied acceleration and discharge conveyors and a PLC plant control system.

Controlled loading ensured

The system is designed for a maximum continuous conveying capacity of 3,000tph. The main component is a 7.4km-long overland conveyor. Upstream of this troughed belt conveyor is an intermediate hopper with a capacity of about 120 tonnes. The material passes from this hopper via a variable-speed discharge conveyor to a downstream acceleration belt that feeds the overland conveyor. This controlled loading system ensures cost-effective operation of the plant, especially during the start-up phase. It also has a favourable effect in the dimensioning of drive components and the belt, and reduces the operating costs.

According to Echelmeyer, "The acceleration belt with a speed of 4 meters per second protects the belt of the overland conveyor and increases its service life." For further protection there are also upstream units for collecting any iron and non-ferrous metals. The limestone is then transported to the blending bed on short troughed belt conveyors.

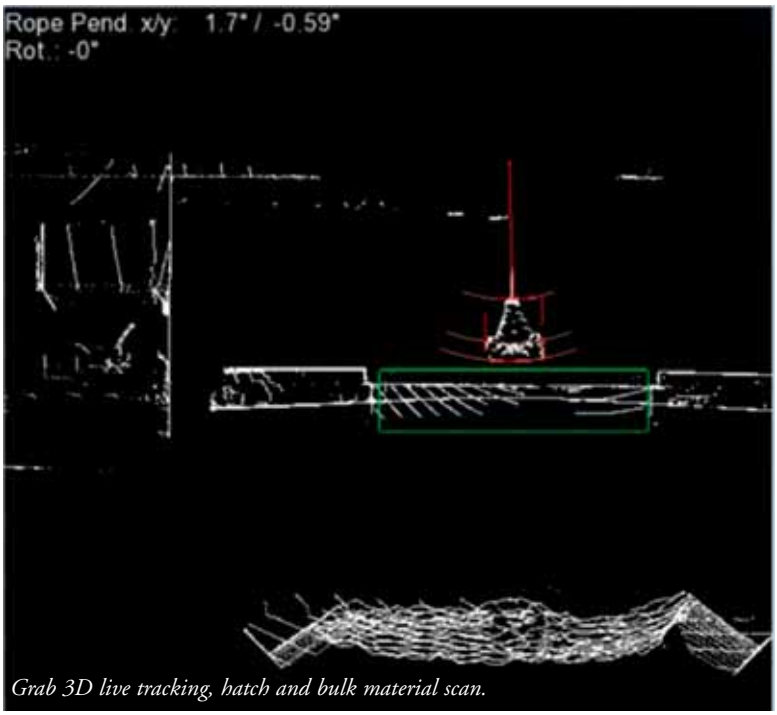
The troughed belt conveyor has a width of 1,200 millimeters and a distance between centres of 7,381 metres. One tail drive and two head drives are installed, each with a rating of 545 kilowatts. The plant conveys the material at a speed of 5 m/s and negotiates a height difference of –188 metres.

Protection of people and animals

The conveying system also runs past villages and for long sections passes through rainforest that deserves to be protected. The CL Systems team has taken numerous design measures to reduce the noise impact on people and animals. Echelmeyer explained that, "Among other things, we have used low noise idler rollers and appropriately dimensioned protective hoods at the drive station." This means that the limestone passes through the rainforest in virtually silent mode. The construction time lasted only one year.

BEUMER Group is an international leader in the manufacture of intralogistics systems for conveying, loading, palletizing, packaging, sortation, and distribution. With 4,000 employees worldwide, BEUMER Group has annual sales of about €700 million. BEUMER Group and its subsidiaries and sales agencies provide their customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, post, and airport baggage handling.

Smooth trajectory control of suspended loads – iSAM® Advanced Gantry Crane Sensor Suite – fast, accurate and reliable measurement



Grab 3D live tracking, hatch and bulk material scan.

State-of-the-art automation and sensor technology provides a higher level of automation to reach additional value and reduce the cost of operation, writes *Bernd Mann – iSAM AG, Chief Officer Development, Design and Technology.*

iSAM offers with its crane sensor suite an easy-to-use package with a high-speed 3D laser scanner determines load position, sway and skew for the accurate control of the load at gantry cranes.

Industrial requirements

Bulk material handling as well as container handling at export/import terminals typically involves extreme levels of equipment utilization. At most locations, the equipment is utilized 24/7, when minutes of downtime create a considerable impact on the profit margin. One of the major business risks is the breakdown of critical equipment. A common, worst-case scenario is mechanical damage to a gantry crane or shiploader caused by a collision, e.g. with the superstructure of a ship. The protection of those valuable assets is therefore a top priority, second only to the safe operation of the terminal.

The task

In an increasingly competitive environment all manufacturers and operators of large gantry cranes have been tasked with providing a higher level of automation to provide additional value and reduce the cost of operation.

As a key function the accurate control of the load is critical. This applies not only to fully autonomous cranes, a reliable and accurate sway control helps also to reduce damages and improve performance in remote-controlled or conventional cranes.

When moving forward to a partly or fully autonomous operation the control system needs additional input about its surroundings, be it the distribution of iron ore in a bulk carrier's hatch or an accurate mapping of container positions.

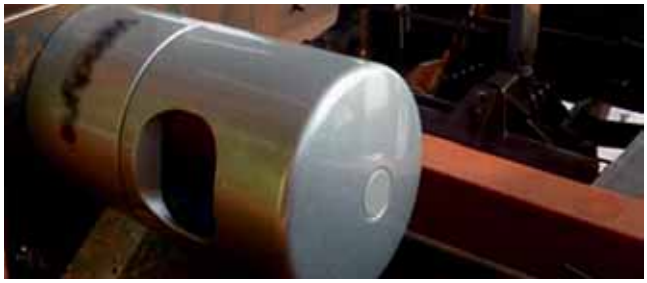
iSAM's crane sensor suite delivers all this information in an easy-to-use package integrating the most advanced sensor systems via a dedicated evaluation unit with direct interfaces to all major PLC control systems. Thus the crane manufactures and electrical solution providers can focus on their core business without spending years to develop complex software for sensor data processing.

The solution

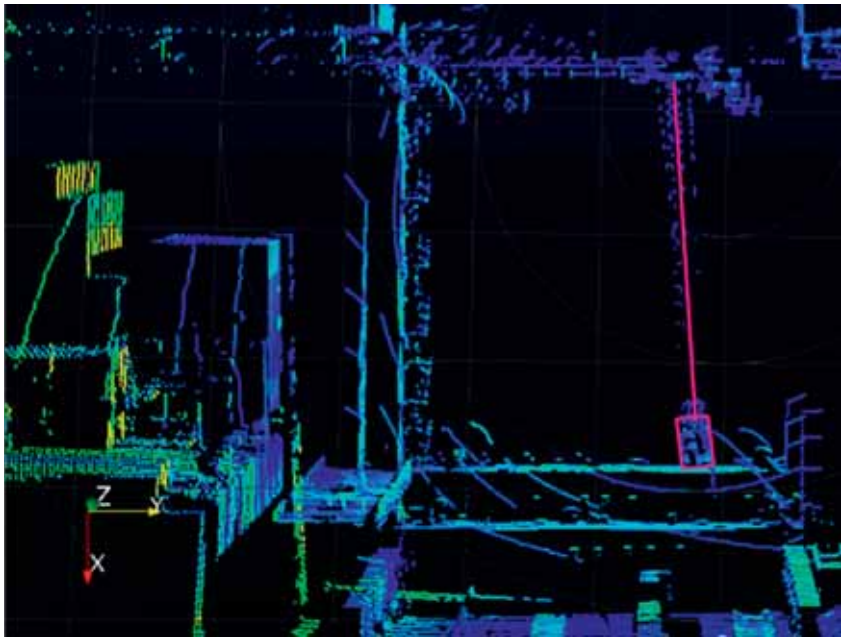
The development of the crane sensor suite started when iSAM was tasked with the full automation of four large ship-to-shore grab unloaders in the Port of Hamburg. From the beginning it was obvious that the company would need an entirely new sensor concept which became a combination of a newly developed 3D laser scanner, field proven RTK GPS positioning solutions and leading-edge processing technology.

One of the key components of the automation system was the intelligent grab tracking system based on a new 3D real-time laser scanner. This new high-tech scanner was for the first time fast enough to track the crane ropes and the grab itself in real time to measure sway and grab attitude.

In most installations — with the exception of the largest cranes and special crane geometries — the same sensor can be



High-speed 3D laser scanner mounted on a gantry crane.



Spreader 3D live tracking, container and ship superstructure scan.

used to track the load and scan the environment on the ship's deck as well as inside the hatches.

Whereas the 3D scanner is the 'eye' of the automation system, a high-performance evaluation unit is mounted on the crane and connected with the PLC – the 'brain'.

In this evaluation unit, data from the real-time sensors ensures a continuous update of the energy and position model for the load along its trajectory. At the same time, all scan data is geo-referenced and pre-processed to allow further handling by standard PLC systems.

Together this information allows a precise 'landing' of the load at any given point — nearly independent of weather conditions, at low tide and high tide.

In contrast to a human operator, the sensor system is not only able to calculate the current position, but also the kinetic energy of the load at any point along the trajectory. This makes sure that the load does not collide with the ship, any obstacles on the deck or the crane structure during the whole cycle — not even in case of 'hard' stops, for instance when an emergency stop is pushed.

Highlights

- real-time actual measurement of load position and attitude, including skew;
- Permanent update of energy and position model along the load's trajectory;
- load control and ship scan with one sensor; and
- easy integration in existing PLC control systems.

Competitive advantages

The use of iSAM's crane sensor suite means a significant reduction of development cost and project risk for the OEM and the port operator by

- using tried-and-tested technology which is in daily use in Europe's largest sea ports;
- pre-processing complex sensor data so that it can be easily used in standard PLCs;
- providing a fully modular system architecture — you buy only, what you need; and
- making certification easier by referring to already fully certified and operational installations.

About iSAM

iSAM was founded in 1983 by Dr. Jürgen Hellmich in Mülheim an der Ruhr, Germany and has focused on advanced automation systems from the beginning. Today the iSAM Group has nearly 100 employees in four global offices in North America, Asia-Pacific and Europe servicing customers in more than 20 countries. Many engineers are already with the company for over a decade — some even for more than two — and they are all continuously involved in the latest technology developments.

iSAM is holding several patents in the bulk handling industry and was the first company to use **GPS and 3D vision technology** for bulk handling automation. With an installed base of more than 50 fully automated machines including 35+ stacker/reclaimers, the world's first operator-less grab ship-unloaders and the world's first operator less shiploaders. iSAM has wide experience in handling nearly all terminal facilities and has delivered automation systems to countries including Germany; the Netherlands; Italy; Canada; Australia; USA; Brazil; Malaysia; and Indonesia.

"We support thinking out of the box. This creates true innovation and frequently opens completely new opportunities for our customers," says Bernd Mann.

Bulk material loading on ships & stockpiles – and also on dump trucks or wagons

Muhr CSR Cascade Speed Retarder and the challenges in 2017

Cascade Speed Retarder CSR – new from Muhr

With the new cascade system CSR, Muhr is expanding its portfolio with a further, extremely high-quality loading system for dust-free and segregation-free, open loading of bulk solids. It is used mainly in the area of ship and stockpile loading, but is also fully suitable for the loading of open dump trucks or wagons.

The cascade principle reduces the fall velocity of the loading product to less than 2m/s. The dust development is thus reduced to a minimum. In addition, possible product segregation is largely avoided with this type of loading. The achievable loading performance can amount to several thousand tonnes per hour, depending on loading product and execution of the loading system. CSR loading systems are available with or without an additional loading bellows.

The CSR principle

The Muhr module strategy enables freely configurable designs and layouts.

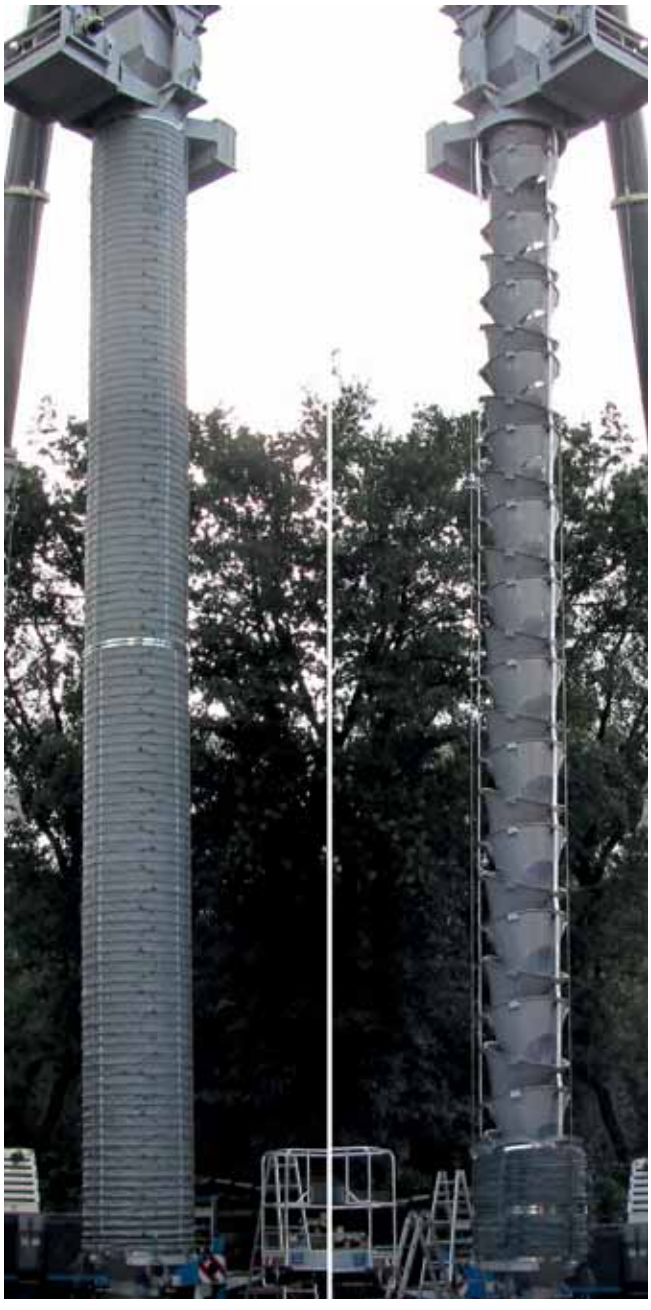
The Cascade Speed Retarder within the Muhr module strategy

Within the Muhr module strategy, the CSR system is a variant of the 'flexible part' module. The 'flexible part' describes the product-leading, flexible part of the loading system between the inlet and the outlet head.

This means that CSR can be combined with all available modules for open loading systems:

- **Connection flange:** freely configurable, with or without articulated head (for mounting on jib booms);
- **Lifting system:** electrically or hydraulically driven cable winches in various designs and layouts;
- **Flexible part:** Cascade Speed Retarder, open or with protective bellows;
- **Outlet head:** available with different dust hoods, energy brake, trimming chute, etc. depending on the individual operating conditions;
- **Control:** independent or integrated into the customer's system, various level indicators, individual realization of any additional functions; and
- **Spout positioning system:** mobile suspension of the loading system for exact, independent positioning above the loading point.

The exact definition of the interfaces between the individual modules guarantees sure compatibility. In addition, this layout also allows integration of individually developed components. This enables Muhr to supply a precisely tailored system for every customer, for any loading product and for any loading situation.



Why it is not only on functional perfection

Individual requirements are rarely restricted to the mechanically functional side. A far greater challenge is the wide range of internationally widely differing specifications regarding explosion protection, environmental protection (especially emission limit values), work safety standards, logistics, documentation as well as individual in-house guidelines and standards or extreme climatic operating conditions.

Taking all these factors into account, implementing in products with the sustainable quality of a product 'Made in Germany' and yet remaining economically attractive, is the claim that Muhr has to meet with every single project — and customers profit right from day one.

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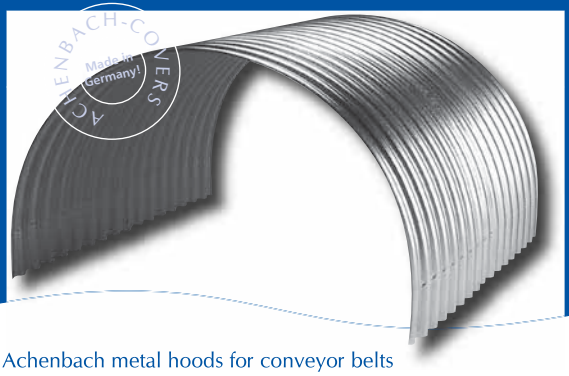

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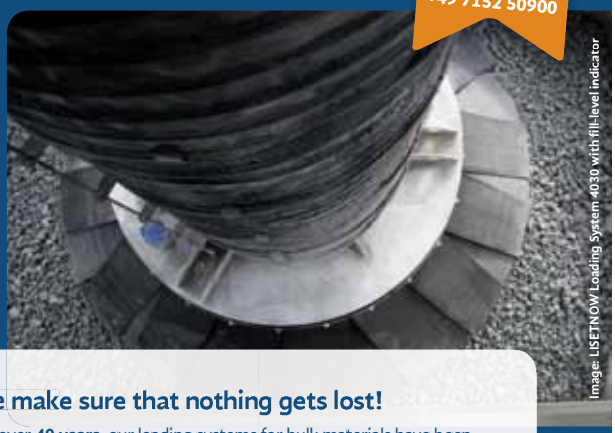

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Brunsbüttel Ports: partner for efficient bulk handling in the Hamburg Metropolitan Region

New crane at the location of Aurubis AG in Hamburg.

New quay tracks at Elbehafen Brünsbuttel.

Direct handling ex ship into rail wagons at Elbehafen Brünsbuttel.

Trimodality at Elbehafen Brunsbüttel.

Brunsbüttel Ports GmbH is part of the SCHRAMM group, owner and operator of the ports of Brunsbüttel (Elbehafen, Oilport, Port of Ostermoor). In addition, Brunsbüttel Ports offers logistics services at two locations at the port of Hamburg at the company Aurubis and at the coal power station Hamburg-Moorburg. Furthermore, Brunsbüttel Ports is operator at Glückstadt Port for regional traffic of bulk and general cargo as well as operator at the heavy-lift port Rendsburg Port.

The Elbehafen Brunsbüttel is a highly flexible multi-purpose port with extended customer orientation and logistical competence. Brunsbüttel Ports competes with the advantages of quick turnaround of cargo, high productivity, safety and reliability within the market. The port offers direct access to North and Baltic Sea as well as to the European inland waterways, being in close distance to Hamburg with available industrial areas next to the port. Next to handling chemical liquids like crude oil and gas and project cargo like for example wind power stations, there was always a focus on bulk goods like building materials, substitute fuels and coal.

A major contract for 20 years started in 2007 covering the entire supply chain of copper ore concentrate for Aurubis AG, Hamburg. The contract involves the discharging of sea vessels, storage, blending when required by the customer, and moving it to the customer in Hamburg with two home vessels constructed for this project, in tide-adapted turns, thus saving energy and giving credit to the environment.

After ten years of successful partnership, Brunsbüttel Ports invested around €3 million Euro in a new crane at the location of Aurubis AG in Hamburg in 2016. This sustainable investment will make discharging barges — which carry the copper ore concentrate from Brunsbüttel to Hamburg — even more efficient.

Furthermore, Brunsbüttel Ports has operated the supply facilities and the waste management facilities of the newly built coal power plant Hamburg Moorburg since 2013. Commodities like coal, gypsum, wet ash, dry ash and ammonia water are handled for one of the most modern coal power plants in Europe.

The Port of Glückstadt is located at the international shipping-route Elbe within the catchment of the metropolitan area of Hamburg and therefore the ideal place for regional traffic of general and bulk cargo. The regional traffic is characterized by an extensive hinterland. Various industries like for example paper, cement and wood as well as power stations are serviced via Glückstadt Port. Also the supply of fertilizers, feedstock and grain is handled at Glückstadt Port.

The Elbehafen Brunsbüttel has more than 40 years of experience with bulk goods. Due to the green business policy of Brunsbüttel Ports and to strengthen the trimodality, the company invested proactively in new quay tracks. The investment is an impulse for expanding in more green logistics by using railway and waterway more intensively in the future. Due to the new quay tracks, the degree of efficiency in bulk handling increased significantly. It is now possible to handle bulk cargo directly ex ship by crane via hopper into rail wagons — in this way internal transport is avoided. DCi

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CONDEPOLS

tailor-made logistics solutions

Spanish company CONDEPOLS S.A. was founded in 1965. It is headquartered in Alcalá la Real, in the south Spanish province of Jaén, where its 8,000m² production plant is also located.

The company manufactures FIBCs (flexible, intermediate bulk containers, commonly known as Big Bags), agricultural nets and WPCs (wood plastic composites).

CONDEPOLS has over 50 years' experience in converting polypropylene, and has a team of over 200 who have helped it to a leading position within the Spanish market, and who have contributed to its worldwide growth.

CONDEPOLS is committed to providing companies with technical advice and tailor made solutions to optimize their logistics and help them to enhance their business.

In terms of Big Bags,CONDEPOLS is a leading company in Spain, and its position in the international market is growing. Main international markets are the European Union (mainly Germany, Netherlands, Belgium, France, Italy and Portugal), North America (USA and Canada) and North Africa (Morocco and rest of Maghreb). Other European and American countries are relevant for CONDEPOLS are large consumers of its Big Bags.

The company is a founding member of EFIBCA – European association of Big Bag manufacturers. It is also certified to ISO 9001:2008 and ISO 22000:2005. Its Big Bags are manufactured according to BRC and HACCP standards, and it has the highest laboratory certifications from LABORDATA GmbH and Bureau Veritas.

CONDEPOLS's Big Bags are used by a wide range of different industries, from chemicals (fertilizers, detergents, pigments, ABS, PVC, polypropylene, polyester, resins, etc.) to food industries (coffee, wheat, barley, salt, sugar, rice, legumes, species, tea, powder milk, seeds, etc.) to other kind of companies (pharmaceutical, construction materials, natural stone, minerals, municipalities, distributors, municipalities, etc.).

While CONDEPOLS has its main production plant in Spain (Alcalá la Real), in order to satisfy all the needs of its customers, Big Bags are supplied from its partners in India. These Indian partners have over 20 years of experience in the sector of FIBC and have been approved after intensive audits carried out by the quality and the technical department of the company. Quality checks are carried out periodically at all Indian facilities.

All Big Bags comply with European standards, whether manufactured in Spain or in India. Having a production plant in Spain offers fast solutions to European and North African clients in case of urgent need of Big Bags. Having production partners in India provides clients with competitive prices.

Traditional and customized FIBCs

CONDEPOLS manufactures and sells traditional as well as customized and innovative FIBCs.

Traditional Big Bags are D1 and D4. D1 is a polypropylene FIBC with one lifting point to store or transport between 500kg and 1,500kg of product. They are specially adapted for products such as fertilizers or cement, with the possibility of including a liner. There is no need for pallets, and one of its advantages is that it can be stored outside. As well as a filling spout, D1 can have discharge spouts, a pyramidal base, and a squared or French bottom.

D1 FIBC.

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CONDEPOLS' D4.

D4 is a polypropylene FIBC with four lifting points to store or transport between 500kg and 2,000kg of product. The upper and bottom part of D4 can be open, have a skirt or have charging/discharging spouts.

D4 include: Big Bags designed for explosive atmospheres in accordance with the standards of the International Electronical Commission (Type A, Type B, Type C – Conductive and Type D – Dissipative); Big Bags for hazardous products as per ADR, RID and IMDG standards; Big Bags with leak-proof seams; Big Bags with ventilation bands (specially demanded by producers of fruits and vegetables); Hood Lift Big Bags (with one or two lifting points being the body's fabric itself the lifting point; Cross Corner Big Bags; and Q-Bags.

The Q Bag — performed bag, baffle bag — has polypropylene straps sewn along the inside parts of the body corners to maintain its square or rectangular shape once filled. This optimizes space during transport and also improves stability. The use of Q Bags means an increase of a 25% in the optimization of space when loading and transporting products in Big Bags.

Customized and innovative Big Bags include: DBulk, Aquabag, No Pallet Big Bag and MCube.

DBulk — inliners for maritime containers — offer cost saving and flexibility in comparison to other bulk bags and storage methods. Both the contained goods and the container are protected from contamination. DBulk bags are easy to charge and discharge by reducing manual handling and charging time.

No Pallet Big Bag.

Aquabag is suitable for all kind of liquids, viscous fluids and fluid solids. It is a flexible bag designed with inner reinforcements which optimizes the space during transport and the storage, and provides maximum stability and safety during storing and transportation. Suitable for food products in compliance to European legislations and easy to re-use by simply replacing the internal bag, AQUABAG is an excellent option for the transport and storage of liquids.

DBulk inliners for maritime containers.

No Pallet Big Bag does not need any pallet or other accessory when being transported from the bottom and not using its loops. This Big Bag does not need a pallet, which saves transportation and storage costs when warehousing.

MCube is an innovative Big Bag patented by CONDEPOLS. It consists of a self-standing FIBC made with a glass-fibre structure which is also cost effective in terms of labour costs as it is not only self-standing but also easy to fold when being stored. DCi

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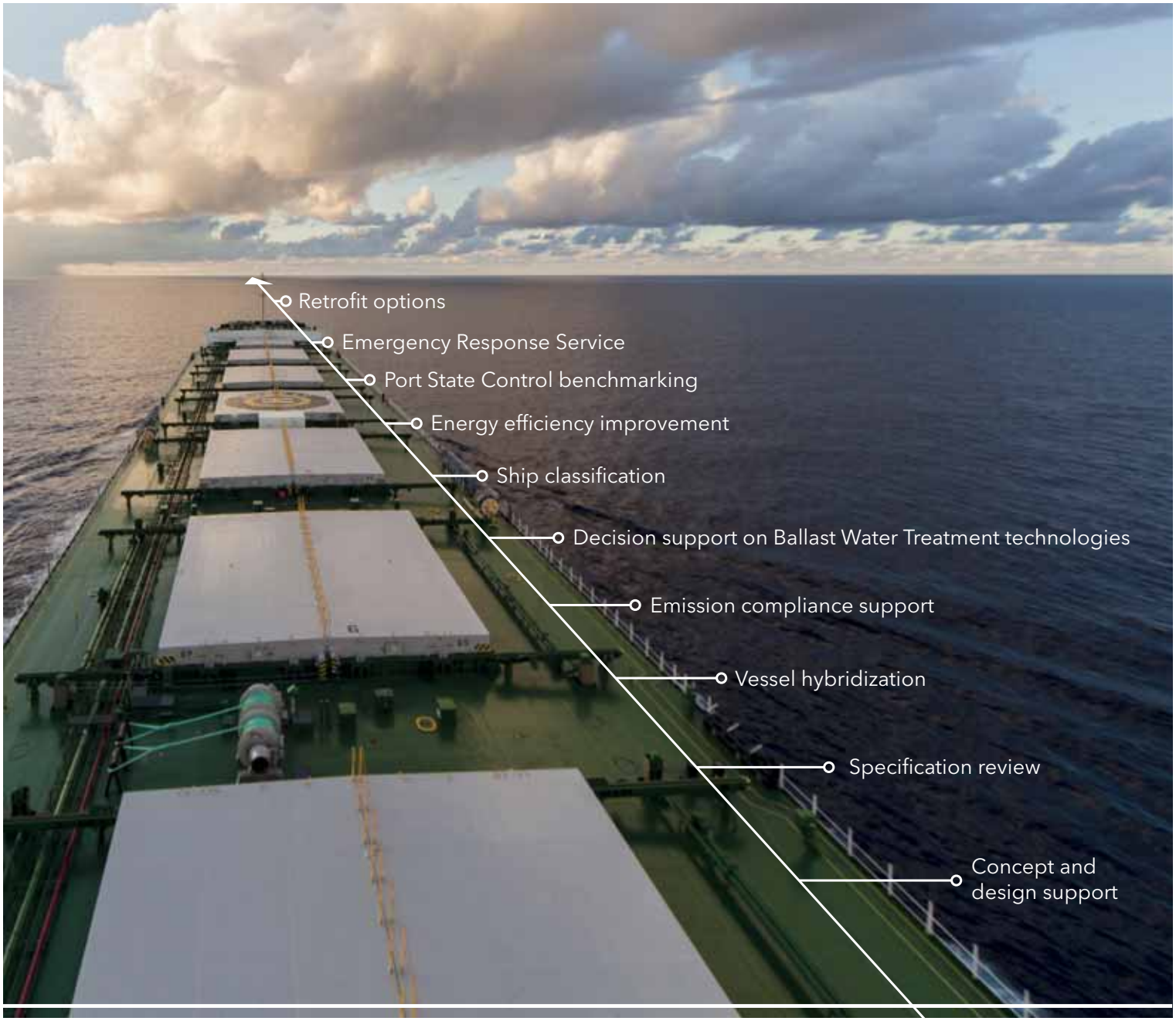

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