

CRA NEVISION



Cranes for growth programme

John Deere production successfully started in Russia

Flying the flag in the land of diversity
New production facility opened in India

Cranes for heavy loads
Demag cranes for trimodal handling

Precision landing
Crane modernisation for Airbus in Germany

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Dear Readers,



Thomas H. Hagen
Member of the Management Board
and COO of Demag Cranes AG

If we want to make customers' wishes the focus of our company's activities, we believe that we have to place the emphasis on solutions. Real added value can only be created by addressing materials handling requirements as a whole and by working closely together in teams to achieve efficient and sustainable solutions that meet the needs of our customers' production and growth ideas in the long term. This is the standard by which we want to be measured in order to maintain successful customer relationships.

In the main article of this issue of Cranevision, we report on a success story that shows how we support our customers in developing new markets. For John Deere's new assembly plant in Russia, we developed materials handling solutions and supplied all of the crane systems. Demag service specialists from our regional subsidiary in the capital Moscow use their expertise to safeguard our customer's investment. Russia is one of the BRIC states, where we are focussing our growth strategy.

Besides the local presence provided by our strategically positioned sales and service centres, we have also made major progress in further developing our OEM partner network in order to serve the market in China. Key process crane orders, for example in the aircraft, paper and refuse sectors, demonstrate the industry expertise that we have also developed for our customers there. Furthermore, we are continuing to expand the international footprint of our research and development activities as a global player with our clear focus on customer needs. For example, our international teamwork in the past financial year resulted in a further success with the first Sino-German patent.

In Brazil, where we have been represented by our own subsidiary since 1972, we have received significant orders. These also include the complete equipment for Caterpillar's new production facility with more than 100 crane installations.

In this issue of Cranevision, we also take a look at the market in India, where we have promoted the localisation of process cranes – with the support of our international development network. The expansion of our sales capacities and the inauguration of new production facilities mark further milestones on the way towards bringing our activities even closer to our customers.

As an example of our industry expertise, we also present you with two projects from the shipping sector. Thanks to the use of our industrial cranes, the range of services provided for trimodal handling has been expanded at the world's largest inland port in Duisburg (page 14).

Starting on page 26, we show you how a system that has been successfully used all over the world for many years can be developed even further. In line with our customers' needs, we have developed a new profile section for our KBK light crane system which enables planning and assembly work to be significantly reduced.

The refurbishment of crane installations can be a real alternative to investing in new ones. Read about examples of this in two articles on the range of solutions offered by Demag Service, which has achieved added value with specific modernisation measures for our customers in the aircraft and automotive industries.

Please enjoy this issue.

Your Thomas H. Hagen

A handwritten signature in blue ink, appearing to read 'Th. Hagen', written in a cursive style.



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Cranes for growth programme

High throughput rates and maximum flexibility: these are the requirements that John Deere used as the basis for its new production and storage facility in Russia. A major contribution towards this success story is provided by Demag crane systems, which have been installed in production cells and support the personnel in all assembly operations.

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Flying the flag in the land of diversity

The new Chakan production location marks a major increase in capacities for the manufacture of standard and process cranes in India. This investment boosts Demag Cranes & Components' presence in a dynamically growing market and emphasises once more its long-term strategic commitment in the region.

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Cranes for heavy loads

Demag overhead travelling cranes are used to lift heavy loads for mechanical and plant engineering at Duisburg harbour. The range of services in the Heavy Lift Terminal and in the Nordhafen sector has been extended from assembly and storage to logistics. This development marks even tighter integration between water-borne and road traffic.



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Precision landing

Instead of just trying to optimise single items, Airbus chose a complete solution to modernise a double-girder overhead travelling crane. The concept for the conversion of the crane, which transports aircraft fuselage sections, was developed by Demag Service and features high productivity and precise "landings" for positioning.

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Cranes for growth programme

Successful start of John Deere production in Russia

High throughput rates and maximum flexibility: these are the requirements that John Deere used as the basis for its new manufacturing and storage facility in Russia. The facility near Moscow is able to offer a wide range of products. Particularly in terms of its long-term goals, the company can vary the layout of the installations within the facility. A major contribution is provided by crane systems supplied by Demag Cranes & Components, which have been installed in production cells and support the personnel in all assembly operations.

Being close to its customers in one of the most important markets for agricultural and forestry machinery was the driving factor for the investment by John Deere, the largest manufacturer of agricultural machinery in the world. This challenge was met in a tight schedule: the new manufacturing installations were opened just nine months after the planned investment was announced.

John Deere assembles large tractors, combine harvesters, backhoe loaders, wheel loaders, timber harvesters and forwarders in an area measuring 20,000 m². The close vicinity to the largest Russian airport Domodedovo was a strategic choice. Besides the manufacturing facility, a 27,000 m² parts distribution facility was built to supply customers direct in Russia and the surrounding markets. The storage area, which measures 11.5 m in height, can accommodate 140,000 spare part and accessory items.

Left photo: Two EKDE cranes fitted with four DR-Pro rope hoists operating in tandem for precise and reliable handling



Station served by two 7.5 and 10 t suspension cranes

Proven material flow

The installation layout in the Russian plant was based on existing manufacturing facilities in the USA. Consequently, John Deere created two production lines with indexed assembly operations in the building. Operations on line 1 include the steps needed to assemble large tractors, with carriers passing through the individual assembly stations. The second line, the so-called "combined line", is mainly used for the completion of harvesters.

All tractors and harvesters are indexed to pass through stations which were built along both assembly lines. The lifting equipment required for these operations was provided exclusively by suspension cranes and complementary pillar-mounted slewing jib cranes. The personnel are supported by a total of 35 cranes for the assembly of the John Deere products.

For this purpose, Demag Cranes & Components erected a total of 18 free-standing steel superstructures with a footprint of 9.1 x 12 m and a height of 8.45 m. The suspension cranes operate on runways which are installed on this support superstructure at an angle of 90 degrees to the direction of the material flow. The suspension

cranes were specified to meet the particular requirements of the individual assembly stations. They range from 1 t EPDE single-girder suspension cranes with a rolled-section girder to EKDE cranes with box-section girders, which can handle loads weighing up to 15 t with their 7.5 t hoist units operating in tandem.

This provides further benefits for improved flexibility. Thanks to the modular design of the manufacturing cells, they can also be moved if the production requirements change – regardless of the existing building architecture.

The individual modules are pre-manufactured in the John Deere plants in America and shipped to the facility in Domodedovo in sea-worthy containers. Via loading docks, the parts are fed to the production lines and conveyed to the assembly stations under indexed control.

Line 1: Tractor assembly

At the beginning of the tractor production operation, the chassis are placed on carriers on line 1. For further completion, the vehicles pass through the various stations in which the pre-manufactured and staged modules such as drive shafts, exhaust systems, the cab and the wheel housings are fitted with the help of the suspension cranes. Three stations are provided with slewing jib cranes from the KBK system, each of



Combine harvesters for the Russian market

which is equipped with a DC chain hoist with a lifting capacity of 250 kg. They are used for positioning the tanks for assembly, for example.

Line 2: "Combined line"

Installed on the second line are nine cells with suspension cranes which, like the cranes on the tractor assembly line, are operated by DST con-



Line 1: Tractor assembly

trol pendant switches. Due to the short crane runways measuring only 12 m, John Deere decided in favour of the cable-connected variant. A special feature is formed by Station 6, where front shovels are fitted, among other items. While all other assembly cells on the "combined line" are each equipped with two identical cranes, three 1 t EPDE cranes operate at this station.



"Combined line", also used for the assembly of combine harvesters

are controlled by radio and feature infinitely variable speeds for all lifting and lowering motions thanks to the use of frequency inverters.

Two EKDE suspension cranes with a span dimension of 7.78 m operate at the largest station in the plant, which has a capacity of 25 t. Their four EKDR-Pro rope hoists, which have load capacities

concept for the planning and implementation of the overall order finally tipped the scales. An important factor was close integration within Demag Cranes global production network, which for this order also included local production capacities for the steelwork at John Deere.

The tight schedule for implementation of the entire construction project placed great demands on everyone involved in the project. The Russian subsidiary of Demag Cranes & Components coordinated and ensured scheduled completion of the order with assembly of the locally manufactured station superstructure segments and installation of the associated cranes and hoists, which were supplied ready for assembly from the crane factory in Luisenthal. A detailed service concept ensures that the crane installations are maintained to a high level of availability. This will provide important support in production for John Deere's growth programme in the country with the largest surface area in the world.



Assembly cells featuring steel superstructures with up to three suspension cranes

Demag Cranes & Components manufactured the lifting equipment according to Russian specifications and equipped all suspension cranes with two-stage optical distance monitoring systems.

For loads up to 25 t

For handling loads with higher volumes and weights, Demag Cranes & Components installed two steel superstructures with cranes for total load capacities of 17.5 and 25 t, respectively. Both of these stations are located upstream of the assembly lines in the immediate vicinity of the loading docks.

The total of four cranes at these stations not only differ from the other installations in terms of their higher load capacities. Due to the large volumes to be lifted in these applications, they

of 5 and 7.5 t, can operate as a double tandem under synchronised control. These cranes are used to gently lift the large parts that are pre-assembled in the USA out of their packing boxes.

The adjacent assembly cell, which is equipped with a 10 t and a 7.5 t crane, can also be used to carry out further work following final assembly. Requirement: production network with global structures.

Besides the proven crane technology, an important requirement for placement of the entire order package for John Deere was a crane supplier with a global network. Numerous reference installations in US plants and in German locations formed the basis for a decision in favour of Demag Cranes & Components. The outstanding





Safely handling turbines

Demag process cranes made in India



+++ FACTBOX +++

Bharat Heavy Electricals Limited (BHEL) is the largest manufacturer of gas and steam turbines as well as components for power generation and transmission in India. The company ranks among the top ten in this segment worldwide.

More than 42,000 employees work for BHEL in 14 factories in the country and at other locations. One of the most important production locations is in Hyderabad, the sixth-largest city in India. Here, BHEL has some 5,000 employees and primarily manufactures gas turbines with outputs up to 320 MW, steam turbines with outputs up to 250 MW as well as turbo-generators, boilers, gearboxes and also drilling rigs.

BHEL, from India, employs cranes for safely positioning large and voluminous parts in the assembly of gas turbines. The Hyderabad-based company awarded a contract to the Indian subsidiary of Demag Cranes & Components to supply two double-girder overhead travelling cranes. The crane installations delivered to the turbine manufacturer are the first process cranes built by Demag Cranes & Components in India with its own engineering and the support of local suppliers.

BHEL assembles gas turbines in the relevant part of the bay. Until now, three older cranes operating on one runway were used for handling loads. Due to increasingly heavier turbine elements that have to be precisely positioned, it was necessary to invest in further cranes. The identical Demag double-girder overhead travelling cranes have spans of 28.5 m and are equipped with two MPW open-winch units with capacities of 80 t/20 t for a total capacity of 80 t each.

Frequency inverters provide for optimum assembly conditions with infinitely variable speeds in all three directions of motion: long travel at speeds of up to 30 m/min, cross travel up to 20 m/min and lifting from 0.4 to 4 m/min for the main lifting speed as well as 0.6 to 6 m/min with the second 20 t hoist unit. The open-winch units can

also be operated together. Thanks to their compact design, they can approach each other to achieve a minimum hook centre distance of 1,350 mm. In addition, optimum utilisation of the available surface area in the bay is possible due to the low approach dimension between the crabs.

The crane installations are provided with two maintenance walkways along the crane girders. The crane operator uses one of the walkways to reach the control cab with ease. This control cab, which can travel along a section of the crane bridge, is used when large and voluminous parts have to be transported, since it offers the best overview. A cable-connected control panel is used for handling smaller parts of the turbines. The owner has also had this process crane prepared for optional radio control.

Process crane in continuous operation

Since they were installed in the turbine production facility at BHEL, the process cranes have seen intensive operation. The owner estimates that they are in operation for six hours during the eight-hour shift. The positive experience gained until now – also throughout the entire project phase – has already convinced BHEL to order further process cranes. Besides three further 80/20 t crane installations, BHEL has ordered a crane with a capacity of 200/60 t and a process crane with a capacity of 150/40 t.





Flying the flag in the land of diversity

New production facility opened in India



Office building in Chakan



Opening ceremony with COO Thomas H. Hagen



Production facility for standard and process cranes



Ceremony with Indian ritual at the Chakan factory



Klaus-Peter Hoffmann signs the photograph of all employees

Following a construction phase of just eight months, Demag Cranes & Components has inaugurated its new production facility in Chakan, India. In total, approximately EUR 8 million is being invested in the state-of-the-art facility as well as in localisation and in improving vertical integration. This investment boosts the company's presence in a dynamically growing, highly promising market and emphasises once more its long-term strategic commitment in one of the BRIC countries.

In almost record time, the enormous "country on the Ganges" has developed into an emerging global economic force and a promising market. Many analysts even consider India to be a prime mover for the world economy. The driving forces of the Indian "economic miracle" include the state of Maharashtra in West India with its capital Mumbai, the former Bombay, and the district of Pune located to its southeast.

In the middle of this metropolitan region, in the town of Chakan – near the industrial centre Pune – Demag Cranes & Components has opened its new production facility – in the immediate vicinity of subsidiaries of global players such as Volkswagen, Mercedes-Benz and General Motors. With the inauguration of the production facility, which measures some 10,400 m², and the office section measuring 2,400 m² in size, production capacities on the sub-continent have been significantly improved to meet future growth.

Wide product range satisfies demand

At the same time, Demag Cranes & Components has tailored its product range to meet the specific needs of the Indian market even better. Besides standard cranes and crane components, for example, complex process cranes designed to fulfil the given application requirements are also produced at the new location in Chakan. The expansion of production with a clear concentration on the requirements of the Indian market reflects the core element of corporate strategy to make customers' wishes the focus of the company's activities.

Tailored to satisfy market demands

In response to the strong increase in demand also in India, production capacity in the new plant is geared for up to 600 standard cranes and 100 process cranes per year. In addition, components such as travelling rope hoists and open-winch units and parts for the proven



Production of components and KBK profile sections

KBK light crane system are also manufactured here. Today, it is already possible to manufacture up to 24 km of KBK rails in Chakan per year.

To achieve optimum solutions to meet individual requirements, Demag Cranes & Components utilises a pool of qualified and highly motivated Indian employees to design bespoke process cranes. The new crane is the result of extremely productive and innovative teamwork between Indian and German engineers who have worked to fulfil the particular requirements of the Indian market and its procurement opportunities.



Paying attention to sustainability

For an innovative and internationally operating company such as Demag Cranes & Components, careful use of natural resources is an important aspect of corporate policy. This approach is also reflected in Chakan. On the extensive premises, which cover a total area of 51,500 m², for example, rainwater is collected and treated for the

company's own needs or returned to the water cycle. This is a worthwhile investment, since the monsoon provides for considerable rainfall in parts of the west coast of India. In addition, a waste water treatment facility has been integrated and vermiculture is utilised to convert refuse into compost. Demag Cranes & Components also meets the needs of its employees with ventilators installed on the roof of the facility. The exchange of air that they generate reduces heat and fumes inside the building. This improves working conditions in a region in which tropical temperatures of 40 to more than 50 degrees Celsius may occur.

Locally serving major markets

Demag Cranes & Components has already been continuously investing in expansion and internationalisation for years. The establishment of a subsidiary marked a first milestone in India in 1997. The new production facility is now a further important step towards expanding the company's position in the market on the subcontinent.

This is favoured by the geographical location of Chakan in a metropolitan region, which provides for close proximity to the customer. This proximity also ensures a rapid supply of spare parts to satisfy demand. Future planning also caters to



Suhas Baxi (left), CEO of Demag Cranes & Components India and Manojit Acharya, Indian Project Manager for the development of the factory in Chakan

expansion with profitable growth in the Indian market, since the production facility in Chakan can be expanded by a further 6,000 m² in a short time.

Girder production and assembly of crane installations





Three EKE overhead travelling cranes, each fitted with two 3.2 t wire rope hoists, operating on one runway in the storage facility



Efficient solutions

Cranes for production and storage

IAE Ltd. has modernised its manufacturing structures with the building of a new production bay and the reorganisation of its storage facility. The British supplier of agricultural feed handling equipment relies on electric wall-travelling cranes supplied by Demag Cranes & Components and achieved its goal to improve productivity.

IAE manufactures agricultural equipment at its 105,000 m² site in Stoke-on-Trent, some 70 km southeast of Manchester. Besides a wide range of feed handling equipment, the company also offers equestrian stabling and industrial fencing. Over more than 40 years, IAE has gained a reputation as the prime supplier to leading stables and farms throughout the British Isles. IAE processes more than 20,000 t of mild steel per year.

Reliable handling increases productivity
IAE has expanded its capacity by the addition of a new 5,100 m² production bay. Planning of the investment focussed on the reliable and efficient handling of material and the fast movement of loads between the various workstations. This task is performed by a 28.8 m span EKE single-girder overhead travelling crane that is equipped with a 5 t DR-Pro rope hoist.



Wall-travelling cranes fitted with long-material spreaders serving production machinery

Parallel to this, IAE reorganised the processes in the existing steel storage facility. Here, a further EKE unit was installed on a runway where two previously delivered Demag overhead travelling cranes operate. Equipped with two 2.5 t SWL DR-Pro wire rope hoists, which can also be operated in tandem, the crane is used to pick up and transport the long material that is required in production. Long-travel speeds of 10 and 40 m/min, variable cross-travel speeds of 5 to 30 m/min and lifting speeds of up to 6 m/min ensure that the material can be handled quickly – enabling the company to benefit from increased productivity.

Wall-travelling cranes for handling long material

In addition, the investment project included four identical 3.2 t SWL wall-travelling cranes with a 6 m outreach, which operate on a runway below overhead travelling crane level. IAE also uses these cranes for fast and efficient processes. The cranes are designed to be operated by one worker. For this reason, the wall-travelling cranes are fitted with spreaders that enable batches of long material to be picked up safely and loaded into high-volume production machinery.

IAE decided on a uniform operating concept for control of the entire crane system. All of the overhead and wall-travelling cranes are radio-controlled. The workers use ergonomic DRC radio transmitters to maintain a safe and convenient distance to the load.

IAE's requirements were fulfilled by the cranes, which offer fast operating speeds, high handling rates and improved safety. The installation of the cranes has made it possible to eliminate the fork lift trucks that were previously used on the factory floor.



Cranes for heavy lifting

Demag cranes for trimodal handling

Demag overhead travelling cranes are used to lift heavy loads for the mechanical and plant engineering sector at the world's largest inland port in Duisburg. Transformers, turbines or entire production installations now start their journey from Duisburg to destinations all over the world. To ensure smooth operation in the

new Heavy Lift Terminal Duisburg (HTD) and other freight-related logistics services, the decision was made to invest in crane systems. The same applies in the Nordhafen sector, where the range of services was extended from assembly and storage to logistics with the construction of a new packing bay.



Barge being loaded in the Heavy Lift Terminal



Handling heavy loads weighing up to 250 t on the quayside

With the aim of becoming a logistics hub also in the heavy-load sector, the Duisport Group, together with partners in the Port of Duisburg, established a central location for the handling, storage and packing of heavy goods and unit loads.

The new Heavy Lift Terminal was built on a property in the outer harbour area, which measures approximately 12,000 m² in size. Until then, capacities for heavy goods in the Port of Duisburg had been limited, which had made it necessary to utilise other external locations. The creation of the heavy goods terminal in Duisburg has not only significantly improved services in the container sector, but also trimodal handling operations for heavy goods. Besides the shore operations, heavy loads are now also handled by cranes on the quayside, where everything is handled which does not fit in a standard container due to its size. HTD is operated by the Duisport Group together with the transport company Spedition Kübler GmbH from Schwäbisch Hall and Kahl Schwerlast GmbH from the neighbouring town of Moers. Regular heavy-duty services by barge provide direct connections to the seaports in the Benelux countries and the north of Germany as well as via the south of Germany all the way to Bulgaria.

Cranes for the trimodal handling of heavy goods, e.g. generators



View of the terminal and rail connection from the shore

Starting recently, individual components from various suppliers are now also collected, packed and buffered in Duisburg for specific industry projects and then shipped direct to destinations all over Europe.

The HTD terminal features a heavy lift bay that measures 2,000 m² in size. The decision in favour of overhead travelling cranes was made at an early stage to ensure that the storage operation and other preparations for loading can be carried out in an environment protected from the weather. Weather-protection equipment such as a canopy for the open-winch units and a special paint finish for all components provide for smooth operation outdoors.

Four of the pillars that support the crane runway stand in the harbour basin. The 95.3 m-long crane runway extends beyond the quayside, which makes it possible to handle heavy loads weighing up to 250 t at the berth.

An onboard wind measuring device reports strong winds starting from wind strength 6 by means of acoustic and optical signals. The crane is then driven inside the protective bay within three minutes.

A double-girder overhead travelling crane equipped with a DR 20 wire rope hoist that is rated for loads weighing up to 25 t operates on the crane runway at a height of 13.6 m. This crane performs the storage and retrieval operations in the bay and is used for loading and unloading railway wagons and trucks.

If the installed crane capacity reaches its limits in some cases, Duisport is well prepared for heavy lifting in the future. Components even weighing up to 500 t can be handled with the help of a mobile crane, which can be used on a special heavy load pallet.

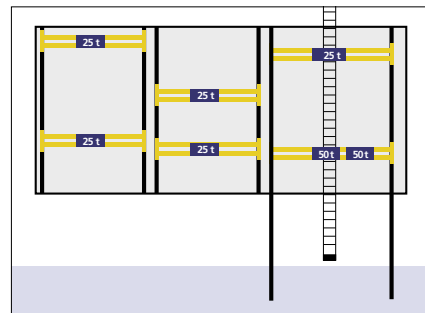


Heavy load trailers being unloaded at the Heavy Lift Terminal

Premiere at Duisport: tandem lift being performed by a mobile crane and a process crane



dpl packing building: the crane runway extends into the harbour basin



Building layout for intermodal handling

+++ FACTBOX +++

duisport – the port

The Port of Duisburg (which operates under the brand name duisport) is located where the rivers Rhine and Ruhr meet and is the largest inland port in the world with turnover of 120 million tonnes of goods and added value of EUR 2 billion per year.

This trimodal logistics hub operates as a hinterland intersection for the seaports and as a gateway for goods traffic to central Europe. Besides goods handling, the duisport logistics location also offers a large number of logistics services.

Some 300 logistics-related companies are located at the Port of Duisburg. Duisburger Hafen AG is the company that owns and manages the Port of Duisburg. The duisport Group, to which the subsidiaries of Duisburger Hafen AG also belong, offers full-service packages in the infrastructure and suprastructure sectors including siting management for the port and for the logistics location. The duisport Group not only considers itself to be a partner for logistics companies, but also makes its own contributions towards optimising transport operation chains.

Services from a single source

The duisport packing logistics GmbH (dpl) subsidiary provides packing and transport services tailored to meet the individual requirements of industrial customers in the area of the Nordhafen. By offering these services, dpl complements those provided by the port group, which included the stuffing and stripping of containers as well as the seaworthy packing of large-volume or heavy



goods. dpl has expanded its own range of services and adapted its processes to match those of the duisport Group. The company coordinates the entire logistics chain from the supplier's workbench to delivery on the construction site. dpl packs industrial goods to the value of more than EUR 1 billion every year.

Development of the area measuring a total of 45,000 m² already started in autumn 2007. In order to create space, the Nordhafen basin was first filled with 600,000 m³ of earth.

A building complex, consisting of 3 bays, is a central feature of the Nordhafen sector. The new packing building was erected next to a 7,000 m² multi-function building. In an area measuring

5,000 m², components for complex industrial installations are prepared for further transport in the packing building.

This building not only extends the possibilities for storing goods; its in-house crane capacities and the protected storage area also enable semi-finished and finished parts to be assembled and maintained. Two bridge cranes are installed in each of the three bays. A double-girder overhead travelling crane fitted with two 50 t hoist units travels in the first part of the building. By operating the hoists in tandem, this crane can also be used for transporting long materials. A 25 t ZKKE double-girder overhead travelling crane with a span of 22,000 mm also travels on the same runway. It offers lifting speeds from 0.3 to 5.3 m/min, cross-travel motions from 5 to 25 m/min and long-travel motions from 5 to 60 m/min. The 175 m-long crane runway in this building in the Nordhafen area also extends into the harbour basin. This enables ships to be loaded and unloaded direct and the area between the quay wall and the building can be fully utilised for storage. Both of the adjacent building areas are each equipped with identical 25 t double-girder overhead travelling cranes. Access for trucks was provided at the side of the building – parallel to the harbour basin – to allow goods to be loaded and unloaded on shore direct inside the building. The railway track passes through the building and ends at the quayside, which also facilitates trimodal handling in the Nordhafen sector.

Fit for outdoor operation: ZKKE with two wire rope hoists



Clean energy to benefit the environment

Automatic cranes for reliable fuel supply in wood-fired cogeneration power stations

Wood-fired cogeneration power stations offering combined heating and power generation play an important role in climate protection. Two state-of-the-art facilities of this kind were recently conceived and implemented by Schuler Consulting Engineers. Demag automatic crane installations provide for storage of solid fuel and needs-based supply to the wood firing system.

Schuler Consulting Engineers (IBS) based in Bietigheim-Bissingen develop state-of-the-art biomass cogeneration plants to meet increasing demand for solutions with sustainable energy sources. The use of left-over wood from neighbouring areas provides for clean energy and offers high efficiency. CO₂ emissions are reduced and stocks of fossil fuels are spared. Dependence on exports decreases and regional added value grows.

Facility concepts show the way

Two wood-fired cogeneration power stations implemented under the general management of IBS in Hamburg and Ludwigsburg are good examples of what can be achieved. The power station in Hamburg-Lohbrügge alone generates some 13,000 MWh of electricity from renewable resources every year. Only natural woodchips from

The automatic crane also provides for the right blend of material.



forestry and landscaping work are used. The heat generated at the same time – some 60,000 MWh – is delivered to a neighbouring district heating plant, which supplies more than 8,000 households with district heating. Combined heating and power generation provide optimum use of the energy contained in wood solid fuel – with a utilisation ratio of 85 %. Flue gas cleaning enables dust emissions to be reduced to a minimum and heat can also be recovered from the exhaust gas. CO₂ emissions are reduced by some 23,000 t per year thanks to the investment in Hamburg.

Focus on automation

Both wood-fired cogeneration power stations operate according to a supply system principle and are each equipped with a Demag automatic double-girder overhead travelling crane, which is controlled via a warehouse management system (WMS). The process cranes store the solid fuel and supply the wood firing system with the corresponding blend of fuel. The crane in Hamburg has a span of 16.4 m and travels on a crane runway at a height of 20.83 m. It fetches the incoming material from the tipping pit (ground level –7.1 m) and transports it to the bunker.

Both process cranes have a rated load capacity of 11 t. Frequency-regulated speeds in three directions of motion ensure optimum travel and lifting characteristics. The cranes provide for rapid material handling with long travel at speeds of up to 50 m/min, cross travel at up to 40 m/min and hoist speeds up to 50 m/min. The cranes have to transport at least 140 m³ of material per hour. The tipping pits can be quickly cleared, which makes it possible to eliminate any waiting times for incoming trucks.

The wood is untreated when it is delivered, ranging from finely shredded material to small branches. The motor-driven multi-jaw grab has a capacity of 8 m³ and is specially designed for handling wood. It can also easily pick up previously compacted material thanks to its high closing forces.

Safe and reliable load handling in the supply process

Some 32,000 t of woodchips are supplied to the wood-fired cogeneration power station in Hamburg every year. Access to the 300 m³ tipping pit is controlled by means of an integrated magnetic card scanning system. As soon as a truck has passed through the weighing station, the barrier is opened and the area above the tipping position is simultaneously blocked for



Filling the silo with solid fuel

any crane operation to prevent damage to the grab caused by falling material. When this step is completed, the crane receives a release signal and starts clearing the tipping pit. In advance, the incoming material is subjected to a quality check and assigned to previously defined fuel grades, which are specified according to three storage zones. The automatic crane stores the solid fuel in the wood silo by types as far as possible.

Any sway resulting from the crane long and cross-travel motions is eliminated by the Demag active load-sway damping system. This ensures safe operation, since any collisions by the grab against the walls are avoided.



Eco-friendly power generation with low CO₂ emissions



Wood-fired cogeneration power station in Hamburg-Lohbrügge and control desk



Besides the storage area measuring 900 m³, the facility in Hamburg also has a silo which accommodates some 700 m³ of solid fuel to meet daily demand. The system is programmed to maintain a continuous fill level in the silo, which is monitored by fixed sensors. From there, the solid fuel is transported to the furnace by sliding sections. When the minimum fill level is reached, the automatic crane is sent on a replenishment mission.

Blending and storage strategies

In addition to its transport duties, the process crane is also responsible for blending the materials. If the quality assurance process reveals that wood cuttings resulting from landscaping work are too wet or do not meet the minimum heating efficiency requirements, they have to

be blended with high-quality wood from forest sources. As soon as the required blending ratio has been set via the user interface of the Demag WMS, the crane automatically approaches the three corresponding zones, picks up the material and blends it in the silo.

Further strategies have been included in the Demag control system. For example: when the grab buries itself in the material, the grab jaws are not initially fully closed. The crane takes the strain and a small amount of material trickles out. The grab can then be closed with the optimum fill level.

The wood-fired cogeneration power stations and their integrated silos were planned to achieve optimum utilisation of the available space. For this reason, the solution with automatic cranes was given preference over stores served by wheel-loaders, for example. Further benefits include: no exhaust fumes, lower noise emissions and a reduced staff requirement to operate the store.

Investing in the future

Municipalities and companies can take greater responsibility for the world climate by making lasting investments in state-of-the-art power generation methods. Wood-fired cogeneration power stations can be used for ecological power generation that is kind to the climate if renewable resources such as locally sourced woodchips are incinerated with a minimum carbon output.

Process-related crane technology plays a key role in this process. Automatic cranes ensure high levels of installation availability and achieve maximum efficiency while retaining flexibility. In this sense, Demag Cranes & Components also plays an important role in preventing climate change by developing lasting system solutions.



Store with three material zones



Optimum material flow

Demag crane fleet for the production of steel superstructures

In the course of its on-going internationalisation programme, Demag Cranes & Components is continuing to expand also on the Indian market. The successful integration of a total of 36 cranes in Zamil Steel Industries manufacturing facility in Pune is a further significant milestone in this development.

With a production capacity of more than 6 million, Zamil Steel is the largest supplier of pre-engineered steel buildings in Asia and Africa. Established in 1977 in Damman, Saudi Arabia, the company has opened a state-of-the-art manufacturing facility in Pune, India. This facility, in which Zamil Steel has invested a total of approximately US\$ 32 million, will be used to meet the demands of its clients in the domestic as well as the export markets.



Pillar-mounted slewing jib crane with a vacuum spreader used to pick up sheet and plate steel

An area measuring an impressive 87,000 m² is available in Pune for the production of steel superstructures and other steel products. The production capacity is correspondingly high at 30,000 t per annum. The premises are divided up into three bays running parallel to each other, each measuring 345 m long and 23.5 m wide. In this

area, the various parts are cut, drilled, punched, welded and painted and the finished products are finally packed and staged ready for shipping.

The production flow, which covers a number of different workstations, requires smooth and efficient transport operations and, therefore, also a high level of material availability. To ensure that the required production capacity of up to 250 profile-section beams is satisfied in the long term, Zamil Steel decided to employ crane engineering "made by Demag Cranes". As part of a tender, Demag Cranes & Components India secured this prestigious order for the supply and implementation of a total of 36 cranes thanks to its engineering and design capabilities.



Steel superstructures are built in three bays

Precision operation

The Demag cranes have been in continuous operation since the facility entered service. In Bays 1 and 2, the material flow starts in the goods-in area for raw materials. Steel plates measuring less than 8 mm and from 10 to 50 mm are unloaded, stacked and transferred to the production process by a 10 t ZKKE double-girder overhead travelling crane in each bay. The ZKKE cranes, which have spans measuring 23,000 mm, utilise their performance to the full, achieving high travel and lifting speeds and optimum handling rates. This cuts the waiting times for the incoming trucks and provides for a rapid material flow already in the goods-in area.

In Bay 1, Zamil Steel manufactures gantry girders, steel structures for buildings and telecom towers. In this area, five 5 t EKKE single-girder overhead travelling cranes ensure that the prod-

ucts are transported smoothly and reliably to and from the workstations. For example, bundles of steel plates are picked up by a vacuum lifter and stacked on the relevant workbench, as required. Each steel plate is then precisely positioned on the shearing machine by a 3.2 t pillar-mounted jib crane, which has a jib measuring 8 m in length. The steel strips are then transported by the single-girder overhead travelling cranes to the various workstations. Among other items, these feature equipment for semi-automatic butt or fillet welding. The semi-finished columns and beam structures are removed by two 2 t wall-mounted jib cranes. The completed columns and beams are transported away by the EKKE cranes again – also to the painting shop at the end of Bay 1.

Wall-mounted slewing jibs with 8 m outreach

Flexible utilisation of the crane systems

A 10 t double-girder overhead travelling crane is also responsible for the supply of steel plates measuring between 10 and 50 mm and weighing from 3 to 5 t in the middle bay, where columns, gantry beams and steelwork for buildings are produced.





Production facility measuring 345 m in length

The steel plates are fed to the CNC profile burning machines and welding stations by a further five 5 t EKKE cranes, as required. A total of 16 wall-mounted jib cranes, each with a load capacity of 2 t, support the workers at the stations where manual welding work is carried out. Thanks to their outreach of 8 m, the cranes have a generous working radius for precise handling and positioning of the semi-finished pillar and profile beam structures.

The finished weldments are transferred by a 5 t crane to carriers so that they can be transported to neighbouring parts of the bays, where they are shot-blasted and painted.

Rapid and smooth handling

Zamil Steel manufactures roof elements, side walls, rain gutters and other decorative building structures in the third bay. Galvanized and pre-painted coils measuring 1.5 mm thick are used as the basic material. A double-girder overhead travelling crane with a load capacity of 10 t unloads the incoming trucks and gently stacks the coils in a marked storage area.

The pre-painted steel coils are transferred by the same 10 t ZKKE crane and loaded onto a decoiler. These sheets then pass through profile-forming rollers for preparation of various roofing solutions and are stacked in bundles. Zamil Steel makes purlins from galvanized steel coils, which are transported by one of three 5 t EKKE cranes to the slitters and press brake machines.

The cranes also feed special machines, which form the sheet steel into shutters, rain gutters and decorative profiles and finally transport the products to the storage and shipping area. In addition, a 2 t wall-mounted jib crane provides support for the packing and loading work.

Optimum solution

Along the runways of the 345 m-long bays, the Demag overhead travelling cranes can reach any point in the production and storage area – also thanks to the low approach dimensions of the compact DR-Pro rope hoists and crabs. Furthermore, the use of double-girder overhead travelling cranes enables particularly high lifting heights to be achieved.

To ensure smooth and precise handling of the components, the crane lifting and travel motions feature infinitely variable control by means of frequency inverters. For improved ease of operation and maximum operating safety, the cranes are also provided with anti-collision devices, load displays and overload protection. Since the building design does not include any walkways, all overhead travelling cranes were fitted with service cabs, which enable maintenance work to be carried out with ease.

Growing partnership

According to Zamil Steel, particularly the high quality of the products was a major factor that affected the decision to award the contract for this complete project to Demag Cranes & Components. Excellent after-sales support, which now also controls the supply of spare parts, was also reported to be a decisive criterion. In order to ensure the required high level of availability of the cranes, the engineers developed a special concept together with local partners which guarantees just-in-time supply of the necessary spare parts.



Wall-mounted jib cranes with large slewing angles



Safe hold

Crane modernisation above one of the world's largest press lines

Demag Service has modernised a double-girder overhead travelling crane in a minimum timeframe to ensure that it meets future requirements at the Hanover delivery truck plant operated by Volkswagen Commercial Vehicles. The crane, which is used for handling press tools, was fitted with a new hoist unit that is able to position the tools, which weigh many tonnes, with millimetre accuracy on three levels with the help of a special grab. At the same time, a category 3 safety concept was implemented for the installation.

The crane seems to float through the bay with its special grab and the press tools and precisely deposits the loads with ease. To perform these tasks, the 36 m-span double-girder overhead travelling crane needs plenty of power and sen-

sitive controls. Since 2002, it has been serving a large-capacity transfer press with tools, which is the largest press line in Europe. Other tasks performed by the crane include lifting replaced tools out of the press tool carriers on the press and storing them at specified positions in a space-saving arrangement.

Synchronised operation guaranteed

Volkswagen Commercial Vehicles decided to invest in modernisation of the crane in order to achieve even greater positioning accuracy and increased safety. In accordance with the requirements, the Demag Service Refurbishment team designed a new double-rail crab which facilitates semi-automatic operating sequences. Its hoist unit has a total load capacity of 85 t distributed over two 50 t double winch units. It achieves a main lifting speed of up to 8 m/min and is equipped with a telescoping special tool grab.

The crane, crab and special grab are designed to transport and precisely deposit various tool sizes, also with asymmetrical load distribution.

Synchronised operation of the two double winch units, the grab and an electronic load-sway damping system meets important requirements for efficient operating sequences. In addition, the new solution makes it possible to move the loads carefully and without any tilt, also with automated load pick-up.

The precision with which the grab deposits the press tools at the storage positions and on the press tool carriers presented a special challenge. Regardless of their differing centres of gravity, the tools have to be precisely transferred down

Optimised storage of tools at the Volkswagen press facility in Emden





A second bridge crane lends support during delivery of the crab



to the millimetre, despite the fact that not even their interface pins are standardised. The required precision is based on the use of Dedrive-Pro frequency inverters for the two crane end carriages, which also feature synchronised operation and can be controlled separately for fine positioning.

True vertical lift

Modifications to the crane electrical equipment, which had become necessary due to installation of the frequency inverters, for example, also enabled Demag Service to improve synchronised operation of the hoist unit. Compared to the previous arrangement, which had to rely on only one frequency inverter, the new crab positions by means of inverters that function as master and slave units. In addition, frequency inverters are used to feed the hoist motors of the two double winch units to ensure that the four ropes, which are each used in 4/1 reeving arrangements, run off the drums in an exactly synchronised motion. The electronic sway-damping system also makes a significant contribution towards keeping the tools in a vertical position.

Before the second double-girder overhead travelling crane, whose load capacity was increased from 80 to 85 t as part of the modernisation work, can utilise its maximum speed, it raises the hook of its hoist unit to the highest hook position. Since the grab also has to be mechanically guided in this position, the gripping mechanism and the crab were fitted with two pins and their corresponding counterparts, respectively. When the crane lowers its load, the control system reduces its travel speed.

The speed of the hoist unit is also automatically controlled. The crab, which has a span of 4,100 mm and is equipped with a position measuring system and a maintenance platform, can travel at variable speeds of up to 35 m/min, depending on the travel area. This enables the double-girder overhead travelling crane to replace tools in accordance with the operating cycle along the entire press line and contribute towards continuous production. The rotating grab can pick loads up in any position.

Positioning the crab on the crane girders



Routine work for Demag Service: precise alignment of the open-winch crab

Operation of the crane is also simplified, since the positions where the crab and the crane stop to pick up and deposit the loads can be taught into the control system, and subsequently approached semi-automatically. On the basis of the saved data, the control system knows the coordinates of the storage location for each set of required tools, which always consists of nine individual tools, and the destination of the transfer position on the large-capacity transfer press.

The crane control system avoids any areas that are blocked for the crane and the crab both while loads are being transported and while the crane is travelling without a load.

Complete safety

Demag Cranes & Components contributed its own expertise towards the safety control system according to category 3, which Volkswagen Commercial Vehicles required throughout the system with reference to all drives of the double-girder overhead travelling crane. This requirement applies to the long and cross-travel motions as well as the double winch units of the hoist ar-



Serving the tool carriers with press tools

rangement. According to category 3 as specified by DIN EN 954, Part 1, controls have to be of redundant design with two systems, of which one is used for monitoring. A double safety factor is also provided in this application by the sensors on the tool gripping device and its separate S7 control system, which communicates with the crane PLC system via a radio data link.

Increased safety is also achieved since the workers no longer have to manually attach or disconnect the loads for the storage operation. Using the tool gripping device, Volkswagen Commercial Vehicles now stores the tools on three instead of only two levels as before. The available storage height can now be used more efficiently and floor space has been gained for more tools, the number of which is increasing due to the greater number of vehicle variants needed to meet market demand.

Additional safety is provided by electronic overload protection on the hoist unit and its load spectrum recorder, which the service engineers use to read out the elapsed duration of service and, therefore, the remaining service life of the of the hoist unit every year.

Tight schedule

Volkswagen Commercial Vehicles set demanding requirements due to the very tight schedule. The modernisation work had to be carried out during the three-week holiday shutdown period at the Hanover location. Despite the very short time available, Demag Service managed to combine the existing components with new technology and to install a solution, as the automotive manufacturer is highly satisfied with Demag ex-

perience and technology. Furthermore, Volkswagen already operates a large number of Demag cranes, which simplifies spare part stocks. Additional arguments included the rugged design of the tool gripping device as well as the Demag service personnel assigned to the Hanover commercial vehicle factory, who are able to respond in a minimum of time. The safety concept to category 3 was also implemented in all cut-off arrange-

ments. Other aspects also spoke in favour of Demag Service. It was also able, for example, to provide its own verification of the static calculation for the increased load capacity, and it also offers the entire range of services from project engineering to inspection support from a single source.



Safe and reliable storage of the tools on three levels



High-grade production

Award by international jury
for Wetter production location



*) Second place in the "Best Factory – Industrial Excellence Award 2010"

High award for Demag Cranes & Components: the company won second place in the prestigious "Best Factory – Industrial Excellence Award 2010". An international jury granted the award to the Wetter/Ruhr production location for excellent production management. This acknowledges outstanding management quality as a basis for profitable growth. The award confirms that the manufacturing location

in Wetter has top-quality production and that it meets the market's demanding requirements with its performance and flexibility.

Industrial Excellence Award 2010

The "Best Factory/International Excellence Award" has been awarded since 1995. This competition is held by the French INSEAD School of Management and the Chair for Production Management at the Otto Beisheim School of Management (WHU) in Vallendar near Koblenz. Both institutes are supported by the German Wirtschaftswoche and French L'Usine Nouvelle business news magazines. Manufacturing companies are invited to compete with the best factories.

Processes for growth and profitability

A jury made up of international specialists for production management looks into a factory as an entire organisation unit in terms of growth and profitability. Operating strategy planning processes are reviewed to the same depth as the management of resources, skills and knowledge and the services to be provided.

Demag Cranes & Components received very good grades for its strategic product development. Demag Cranes & Components was seen to address customer requirements at an early stage, focus its product range and consistently implement improvements in its production processes.



KBK profile sections being powder-coated



Assembly line for the DC generation of chain hoists

Machining centre for gearbox housings



Major role played by motivated employees

Besides the integration of suppliers and customers, the way in which employees are involved in the processes to ensure lasting competitiveness was of central importance for the jury. Partner management and the continuous improvement scheme, in which the employees are actively involved, were also rated highly.

All employees – from procurement to shipping – were highly motivated and committed and contributed towards the success of the project. The entire team prepared intensively for the competition and ultimately received exceptional praise from the jury for its efforts.



High quality and short throughput times



+++ FACTBOX +++

Production location in Wetter/Ruhr

The foundations of the Demag Cranes Group were laid with the establishment of “Mechanische Werkstätten Friedrich Harkort” in Wetter an der Ruhr in 1819. Today, the company produces crane components and light crane systems for the world market at this location. Besides the KBK crane construction kit, these products also include the DR generation of rope hoists and DC chain hoists. Wheel block systems and geared motors are also manufactured and shipped all over the world from the Distribution Centre at this location. In recent years, some



EUR 14 million has been invested in modernisation of the production infrastructure.



DR bottom blocks in rope hoist assembly line

Gear wheels before being hardened



Sizing up the system

Improved flexibility with the new KBK II-H profile section

Greater distances between suspensions as well as simplified planning and assembly result in greater efficiency. With its new KBK II-H profile section, Demag Cranes & Components has presented a solution to meet market demands even more flexibly and cost-effectively. Planners and owners of KBK installations can now benefit from even more flexibility. At the same time, compatibility with the existing KBK II profile section is ensured.

More than four decades after its market launch, the KBK crane construction kit is still the No. 1 among the modular light crane systems and continues to set the standard – for example also with the new KBK II-H profile section.

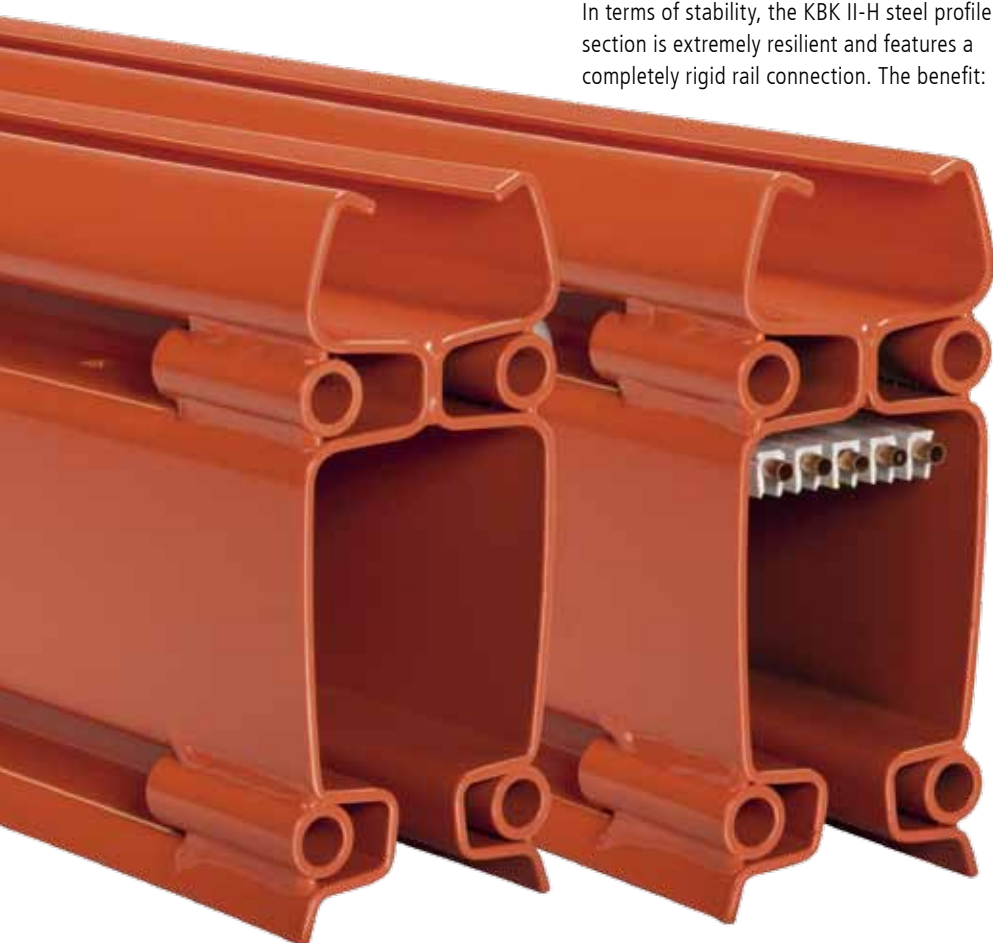
Extended benefits

This inside-running rail section makes it possible to build monorails and crane installations with load capacities of up to 2,000 kg. Its major advantage: the KBK II-H steel profile section offers benefits for larger span dimensions or distances between suspensions. Using the KBK II size profile section, it is now possible to achieve distances between suspensions of more than 6 m for loads on the profile section of up to 1,200 kg.

The need for additional supporting steelwork can be reduced or completely eliminated. The new profile section is an ideal alternative to previously expensive installation combinations. With its excellent deadweight to load capacity ratio, the KBK II-H profile section is a leader in the light crane system market.

Innovative rail joint with high load capacity

In terms of stability, the KBK II-H steel profile section is extremely resilient and features a completely rigid rail connection. The benefit:



+++ FACTBOX +++

The KBK light crane system was first presented in 1963, forming the Junior system with the then PK chain hoist. The KBK II profile section was launched only two years later. This marked the start of the KBK light crane system's success story all over the world – and made Demag Cranes & Components the market leader for modular light crane systems.

From stand-alone solutions to suspension monorails and area-serving crane systems, the KBK light crane system makes it possible to build solutions tailored to meet individual needs.

With the new KBK II-H profile sections, the KBK system now includes profile sections in six sizes: from KBK 100 to the KBK III outside-running section with a load capacity of up to 3,200 kg. The profile sections are manufactured at the production location in Wetter/Ruhr.

The rail joint can be subjected to a full load, regardless of the position of the track suspension. Additional steelwork is not needed. This makes planning and project engineering much easier – and also assembly and installation. For example, KBK II-H eliminates the need for straight sections in special lengths in order to locate suspension arrangements at pre-defined positions. The rail joint connection uses self-retaining nuts that are secured against turning.

More efficient and robust

The crane suspension fitting and suspension clamps are supplied ready for assembly. They can be fitted direct at any position along the profile section. Safety is improved by positive transmission to the suspension of any forces that occur in normal operation. This is accomplished without a bolted connection; the bolts are only needed to fix the arrangement in the horizontal plane.

Compatible profile section

Improved rigidity and, at the same time, lower costs are two benefits that also enable the KBK II-H steel profile section to compare more favourably than the KBK II-T profile section, which will be replaced by the new section in future.

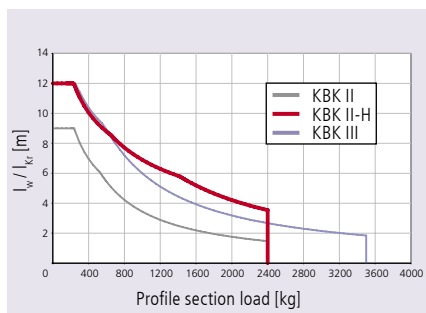
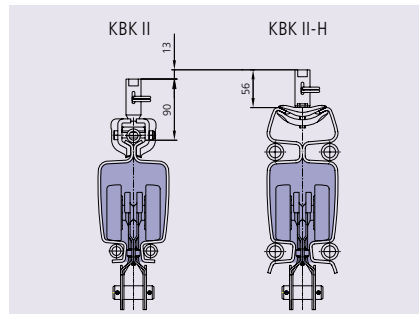


Diagram: KBK profile section load curves

The KBK II-H steel profile section features an installation dimension that is only 13 mm higher than KBK II and can be easily integrated into existing or new installations with KBK II size sections. All trolleys and travelling hoists from the KBK II range can also be used with the new profile section. A profile adapter, which will be available in the course of 2011, provides full compatibility with the KBK II system. This will enable the KBK II-H profile section also to be combined with KBK II curved sections, track switches, turntables and drop sections.

Two types

The new KBK range can be supplied in two types versions. In addition to the KBK II-H profile section, an identical design with internal 5-pole conductor rails is available as KBK II-H-R.



KBK II-H is compatible with the KBK II profile section – with an installation dimension that is only 13 mm higher



Both types also offer the other proven benefits of the KBK light crane system:

- Individual solutions tailored to meet all customer needs
- Flexible conversions are possible
- Extremely resilient and ultraviolet-resistant surface coating
- Available worldwide with short delivery times

The KBK light crane system: nine profile variants in six sizes





Process crane above the gantry



Integrated intralogistics solution

Cranes in the assembly bay at SMS Meer

The plant engineering company SMS Meer has taken an important step for future growth with the construction of new buildings for production, logistics and offices. In the course of concentrating elements of its business operations at its headquarters in Mönchengladbach, the company also invested in a new heavy-load bay. In this way, the company caters to increased demand for high-performance presses, for which bulky and heavy components are produced in Mönchengladbach. For the heavy-load bay, SMS Meer developed an intralogistics concept for handling components that weigh up to 180 t. Demag Cranes & Components supplied five overhead and wall-travelling cranes, which were installed on three operating levels.

The large-volume installations produced by SMS Meer also recently included an extrusion and extrusion tube press for aluminium profile sections for a Chinese customer. With a press capacity of 150 MN, it is currently the most powerful aluminium press in the world. Its components were among the first which were built and assembled in the new heavy-load bay.

Heavy-load bay with 3 crane levels

The new building complex at SMS Meer, which measures 181 m in length and 24 m wide, offers sufficient space for the machining centres and assembly stations. The logistics concept developed for the heavy-load bay includes supply of the unfinished parts and removal of the assembled installation elements by heavy-lift units to the ends of the bay, as well as the in-house material flow with cranes. To meet these requirements, five overhead and wall-travelling cranes were installed on three operating levels.

A Demag process crane fitted with two open-winch crabs is used to transport the heavy loads on a runway installed at a height of 14.15 m. The crane primarily serves a gantry milling centre in the west of the bay. The two MPW multi-purpose

open-winch units installed on the crane have load capacities of 180 and 90 t and operate at load-dependent variable speeds. While the main hoist can lift and lower loads weighing up to 115 t at speeds of up to 3.7 m/min, full loads can be moved at up to 2.4 m/min. The second hoist unit positions loads with a maximum speed of 7.5 m/min (up to 50 t) and 4.5 m/min. Frequency inverter-fed drives for the long and cross-travel motions also provide for convenient handling and precise positioning.

The two MPW open-winch units on the process crane are also employed in tandem for handling large-volume components. The compact design of the crabs enable them to approach each other with a hook centre distance of 3.05 m.

In addition, the open-winch units are designed for safe, reliable and precise turning of the workpieces. Unfinished parts need to be turned to ensure that both sides can be machined by the gantry milling centre.



Two wall-travelling cranes used for transporting and positioning material

Other unfinished and assembly parts are transported by two standard overhead travelling cranes that have a span dimension of 20.32 m, and operate on a second crane level at a height of 10.28 m over the entire length of the bay. Crane 1 operates in the east of the heavy-load bay and is fitted with an EKDR-Pro monorail travelling hoist that has a load capacity of 10 t. Long travel at speeds of up to 60 m/min and cross travel at up to 30 m/min ensure that the assembly stations are quickly supplied with the necessary components. The second crane operating on this runway is of double-girder design and is equipped with a main hoist unit for loads weighing up to 32.5 t as well as a 10 t auxiliary hoist unit.

To enable also smaller parts to be turned, it was necessary to install the already compact rope hoists in a space-saving arrangement. By install-

+++ FACTBOX +++

SMS Meer is a part of the SMS Group, a world market leader in the construction of plant and machinery for the industrial processing of steel, aluminium and NF (non-ferrous) metals. SMS Meer was established as a machine factory by the Meer brothers in Mönchengladbach in 1872. By means of organic growth and the acquisition of renowned companies in its "Tubes", "Long Products", "Forging", "NF Metals" and "Heat Treatment" segments, SMS Meer has become a full-range supplier in the metal forming sector. Besides various locations in Germany, the company is also represented by its own subsidiaries in Austria, Italy, Russia, India and China. Its annual sales amount to some EUR 1.2 billion; the company currently has some 2,400 employees.

ing two hoist units on one crab, it was possible to achieve a hook centre distance of 1,288 mm, which enables all machine elements made by SMS to be prepared for machining on both sides with the help of the Demag cranes.

Additional safety devices were installed to avoid any collisions between the crane system and the gantry milling machine during normal operation.

For this purpose, sensors measure the distance between the crane girder and the milling machine carriage, which travels along a 30 m-long portal rail. Below distances of 6 m, the crane travel speed is automatically reduced and a warning message appears on the operating panel of the milling machine. At a distance of 3 m, crane travel stops completely and at a distance of 2 m, the gantry stops any forward motion in the X axis.

Two identical wall-travelling cranes that have a maximum lifting height of 6.24 m and an outreach of 7 m operate on a third level below the overhead travelling cranes. Fitted with a 5 t DR-Pro rope hoist, they travel on a crane runway measuring a total length of 98 m and are responsible for transporting material to the individual workplaces. In addition, they are used for positioning tasks at the assembly stations.

The five cranes installed in the heavy-load bay are operated by radio control. This enables the operators to handle the loads with ease and affords them the maximum possible freedom of movement at a safe distance to the load.

SMS Meer already involved its supplier Demag Cranes & Components in the planning at an early stage. This enabled any interfaces to be defined and agreed at an early date. The result is an integrated intralogistics solution on three levels which exactly meets the customer's requirements.

Compact design: wire rope hoists with a hook centre distance of 1,288 mm on one crab





Strong alliance in the market

Certified partners see positive result



An ambitious project was started under the title "Certified partner of Demag Cranes" in 2006. The successful recertification of the participating companies is a further important milestone and emphasises once more the priority of the strategic alliance to offer expertise and quality all along the line.



Advisory committee meeting of the partner companies

There are currently 23 companies which are certified partners of Demag Cranes in Germany. With a new logo, which is used to supplement

each company's brand identity, they display their membership in this group to symbolise their close association with Demag Cranes.

This concept was born as part of a workshop in 2006 and has been continuously further developed since then. It is based on a simple, but highly effective idea. The aim was and is to bring together companies from the crane production, crane service and trade sectors to achieve a stronger presence in the market. Projects will now be jointly implemented and benefits gained from synergy effects with strategic partners whose product lines complement the range of products and services offered by Demag Cranes.

The partner companies are selected according to criteria that had been previously defined by the five-member advisory committee. After audits had been completed, the participating companies were first certified in 2007.

The 23 partner companies have successfully completed recertification. In the course of this programme, special qualification measures were carried out at personnel level. This applied to both service employees, who completed a practical test, as well as commercial employees, who completed an online test via the Internet.

All partners agree that the strategic alliance also provides decisive stimuli for the development of their own enterprises. Mutual benefits can be gained from sharing specific strengths and services and utilised to the advantage of their own customers. The group is equally interested in promoting qualifications as well as quality.

Specialists from various disciplines in the member companies discuss products and processes. The advisory committee forms the interface and channels suggestions and ideas from practical situations. This results in productive dialogue between the certified partners and the company. An in-depth understanding of the products as well as close involvement in the planning and logistics tools provided by Demag Cranes are further building blocks towards achieving successful co-operation between companies

Annual meeting of the certified partners of Demag Cranes



Visible sign of expertise

Interview with Gregor Vetten-Betzin



Gregor Vetten-Betzin,
Managing Director of Vetten Krane & Service GmbH in Neuss
and member of the Advisory Committee of the Certified
Partners of Demag Cranes

Mr. Vetten-Betzin, you are a member of the Partner Advisory Committee. What are the main aims of this body?

Vetten-Betzin: The Committee sets the path and promotes dialogue. It represents the interests of all certified companies and also emphasises that the Certified Partnership is a network which provides mutual benefits. However, consistency in its relationship and loyalty to Demag Cranes are fundamental requirements.

What conclusion can you draw so far?

Vetten-Betzin: We initiated a model for the future when we established the Certified Partnership in 2006. It is a process that is gradually filled with ideas, ultimately to result in a sustainable concept. This is something that we are all familiar with in our normal working lives. As a marathon runner, I know that I cannot decide to run today and then expect to complete the entire distance tomorrow. I need to train and continuously im-

prove. The Certified Partnership works in much the same way. We have already accomplished a lot by means of employee qualification measures and sharing knowledge with each other constantly helps us to move in the right direction. Take the Machinery Directive, for example. Demag Cranes gave us the information we needed and provided us with documentation on this complex subject. This sort of specific information is particularly necessary for smaller companies such as Vetten – but difficult to obtain in this depth. You can see that this is a on-going process that we continuously support.

What personal motivation did you have to become involved in this model?

Vetten-Betzin: I have been working for the Vetten company for 20 years and have always attached great importance to partnership in business. For me, this is a basic approach towards work and life which enables me to develop and from which I ultimately gain a benefit in the long term. However, it also means that criticism has to be accepted. For this reason, it was a logical step, particularly since we have always searched for and found synergy effects in more than 50 years of working together with Demag Cranes.

And how do your customers profit from the Certified Partnership?

Vetten-Betzin: The new logo is a clearly visible sign of the Demag-related skills of our employees. They supplement our own expertise in the crane and service sectors, where our strengths are mainly to be found in the development and production of special cranes for steel-handling applications. This re-affirmation of our partnership with Demag Cranes also signals two very important characteristics, namely familiarity and reliability. That is what the Demag brand stands for. This is due to the long history of the company and the quality of its products, but also the people who are behind these products and who want to be the technology leader in the market. Our customers know that we put our trust in components from Demag Cranes for the development of our solutions. That gives them another good reason to be certain of their choice.

Mr. Vetten-Betzin, thank you for talking to us.



Klaus Bohnet, Head of the German Regional Subsidiary,
talking to Gregor Vetten-Betzin



Unbeatable complete package

Standard cranes assist in roller spinning production operation

With the development of the longest spinning machine in the world so far, Leifeld Metal Spinning GmbH from Ahlen set new standards in metal spinning in 2010. The machine is served by a crane installation supplied by Demag Cranes & Components, which is based on standard solutions, but which is far from standard in design. The two installations communicate with each other in real time by means of "networked intelligence".

Measuring 30 m in length and weighing 200 t – the dimensions alone are certainly impressive. However, Leifeld is not just a "machine's length" ahead of its competitors. Remarkable, too, is the fact that the company, which has a long tradition of specialisation in non-cutting metal shaping, has developed the first solution for drawing tubes measuring more than 15 m in length. The



Metal spinning machine measuring 30 m in length

buyer of the first advanced metal spinning machine of this kind is the Chinese company Anji Precision Pipe Manufacturer Co. Besides quality and quantity specifications, the customer also required the new metal spinning machine to be produced within just 8 months. Accordingly, the Leifeld engineers had to work hard to achieve the successful solution.

As its partner in realising this solution, Demag Cranes & Components supplied an EKKE single-girder overhead travelling crane with a span of 25 m which travels on a 9.4 m-long crane runway. To ensure that the tubes can be handled safely and reliably, the crane installation is equipped with two identical Demag EKDR-Pro wire rope hoists, which can each handle loads weighing up to 3.2 t. Tandem operation makes it possible for two crabs/hoist units to lift and transport loads together.

Strong solution guarantees supply in production

The crane is used to serve the metal spinning machine with the required workpieces and hollow precision parts. All long and cross-travel motions are detected and controlled by means of a laser position-measuring system that is precisely tailored to meet the process requirements.





EKKE and two 3.2 t wire rope hoists serving the longest spinning machine in the world

tion and process stability and also makes a valuable contribution towards greater transparency and process consistency.

If necessary, the crane can also operate independently, thus offering the operator a high degree of flexibility. For this reason, Demag Cranes & Components also supplied and installed the universal DRC-MP radio control system. This radio transmission system, which is based on state-of-the-art mobile phone standards, also enables the workers to control all long and cross-travel motions precisely and carefully at a safe distance to the load. Visualisation of the system operating data also provides for maximum installation transparency.

Precision “made in Germany” pays off

Following successful trials at Leifeld’s facility in Ahlen, the entire installation was disassembled and shipped to China (Shanghai) as single transportable machine elements at the end of June 2010. After it arrived, Leifeld employees re-assembled the installation and were responsible for successful commissioning on site. A service team from the Chinese subsidiary of Demag Cranes & Components installed the crane installation. Following the start of production operation, very long and thin parts, and therefore also containers, are manufactured with significantly reduced material thicknesses in the “Land of the Dragon”. In this way, considerable transport costs can be saved, such as those incurred for high-pressure containers filled with gas. For this reason, the investment in the highly advanced metal spinning machine will quickly pay off.

As the first step, the crane automatically picks up the semi-finished products, which measure between 60 and 650 mm in diameter, where they are staged in front of the spinning machine. This is accomplished with the help of two specially designed load-handling attachments in the form of C-hooks with a V-shaped support, which are suspended from the bottom blocks. Any rotation of the load-handling attachments is reduced to a minimum by means of horizontal adjusting screws. At the same time, they enable the angle to be adjusted with reference to the transport axis.

As soon as they have been picked up, the loads to be transported are fully automatically transferred to the machine under the guidance of the laser position-measuring system, where they are safely and gently deposited with maximum precision. After they have been machined, the finished parts are removed and then transferred to the acceptance station. Production capacity is above average with more than two tubes per hour. This output is supported by the increased lifting and cross-travel speeds. Thanks to the Demag DR-Pro wire rope hoist, Leifeld also benefits from an optimised hook path and the reduced approach dimensions of the crabs. The DR-Pro is equipped to meet the requirements of a wide variety of applications as standard. Its features also include a load spectrum recorder, which supplies reliable information on the remaining service life. The crane travels at speeds of up to 20 m/min, the hoists each travel at speeds of up to 30 m/min. Loads are lifted and lowered at speeds of up to 9 m/min. With these performance values, the Demag crane installations meet Leifeld’s requirements for high handling rates. Three motion axes of the installation are controlled by frequency inverters. Consequently, the tubes can be picked up, positioned in the

machine and deposited gently with pin-point precision. Variable speed control also reduces the mechanical load on the crane installation.

Communication between crane and machine improves operating reliability

Even though the EKKE is a standard crane, the installation is still a special solution due to the serial CAN-bus control system integrated in the DR wire rope hoists. Operating sequences – including pre-positioning – can be systematically (pre-)programmed using this open standard (Controller Area Network) for control and monitoring of the installation. For the user, this translates into maximum operating reliability. This solution was ultimately also one of the factors that resulted in Leifeld awarding the contract. The CAN-bus control system has a module that serves as an interface to the customer’s Profibus control, which measures and controls the production processes. Connecting the two control systems enables the metal spinning machine and the crane installation to communicate with each other in real time. The module also makes it possible to supply the crane with parallel control signals. “Networked intelligence” of this kind, in this case the use of standards such as Profibus and CAN-bus in one application, is a major factor that results in increased installa-





Strategic warehouse management

Automatic paper roll store for Mondi

The paper manufacturer Mondi has upgraded its Polish location in Świecie with a substantial investment. The company covers the entire value chain from the processing of recovered paper to the production of corrugated paper. The core of this facility is the new PM 7 paper machine, the production output of which is accommodated by a paper roll shipping store. Demag Cranes & Components installed the fully automatic crane-served store and, at the same time, has successfully strengthened its presence in Eastern Europe.

Demand for paper for the production of corrugated paper is growing. Increased industrial production has caused a rise in demand for suitable packing material. In addition, plastic packing material is being replaced by corrugated paper as an environment-friendly alternative, since it is a raw material which can be fully recycled.

High-speed production

The PM 7 produces fluting and testliner papers in grammages from 75 to 140 g/m². With a machine speed of 1,800 m/min and an annual production capacity of 470,000 t, it is one of the fastest container board machines in the world.



The process cranes gently transport the rolls of paper by means of vacuum lifting devices

The production output has to be channelled, efficiently stored and prepared ready for shipping in good time. These tasks are performed by the automatic paper roll shipping store supplied by Demag Cranes & Components, where three process cranes in two bays are controlled by the Demag warehouse management computer.

After passing through the rewinder, the machine-width rolls of paper are cut on a roll cutter to specific customer diameters measuring between 700 and 1,600 mm and widths of up to 3,500 mm. The rolls of paper are then transferred to the conveyor system. They are then strapped, measured, provided with a printed label and transported to the storage area. The conveyor line passes through the two parallel storage areas in the middle of the building, which measures some 90 m in length. The warehouse management computer decides whether the rolls are to be transported to the automatic store, to the small stacker-served store or direct to the shipping points.

Maximum storage capacity achieved

For the storage operation into the automatic store, there are two bays that are identical in size, of which the first accommodates rolls measuring up to 2,800 mm in width. Rolls measuring up to the maximum width are also accommodated in Zone 2.

The infed points of the automatic store were installed in the middle of the bays parallel to the conveyor belt, where the vacuum lifting devices on the cranes pick up the rolls, which weigh up to 5.2 t, and transport them to the assigned storage locations. The transport line at the level of the paper machine is located 7.5 m above the store floor level. Since the loads are picked up by a vacuum lifting device from above, the rolls can be stacked close together at heights of up to 15 m. The store is based on a space-saving grid layout, which enables up to 1,541 stacks to be created – with maximum roll diameters plus 100 mm. At a theoretical fill capacity of 100 per cent, the store can accommodate 34,700 t of paper. The storage operation continues around the clock.

Process cranes with high handling rates

Three double-girder overhead travelling cranes operate in the automatic store. In storage zone 1, one crane performs all transport operations; the parallel storage zone 2 is served by two other cranes. Since their working areas are defined, the cranes can cross into the other half of the store to complete transfer operations, for example.



The conveyor line passes through the 90 m-long storage zones.

+++ FACTBOX +++

The Polish company Mondi Świecie S.A. belongs to the Mondi Group, a leading European manufacturer of corrugated base paper.

Mondi Świecie uses its new PM 7 to produce light-weight paper that is needed as the basis for the production of corrugated paper and packing material. Commissioning of the PM 7 will see an increase in Mondi's demand for recovered paper up to 900,000 t per year – some 40 per cent of the paper recovered in Poland. Approximately half of the annual production output of 420,000 t is supplied direct to Mondi's neighbouring corrugated paper plant. A paper recycling installation, the PM 7 paper machine, the corrugated paper plant and the automatic paper roll shipping store form a total investment with a volume of EUR 305 million at the Świecie location. This represents a considerable increase in the production network operated by Mondi Corrugated Packaging, of which 5 of the 18 European plants are based in Poland alone.

The three identical crane installations have spans of 29,200 mm and are fitted with multi-purpose winch units (MPW). Frequency-controlled drives provide for variable speeds – and make it possible to carefully position the rolls of paper. Crane long travel at speeds of up to 120 m/min and cross travel up to 80 m/min, as well as hoist speeds up to 100 m/min, provide for high handling rates. With more than 100 roll cycles per hour, the crane installations are responsible for storing the output of PM 7 and staging the rolls of paper for shipping in good time. For the retrieval operation, the cranes deposit the rolls of paper at defined transfer points. They are then labelled and transported to Level 0 by the conveyor system and a load elevator.

There are six stations available for loading trucks and a further one for loading wagons.



Three identical process cranes operate in two parallel bays.

Warehouse management system controls cranes

The warehouse management computer (WMC) is connected to the Mondi host system as an autonomous unit. By comparing the theoretical and actual dimensions, both of these systems share information on the measured roll data and the positions of the rolls. The other monitoring and control functions are performed entirely by the WMC:

- Control of the crane installations
- Status visualisation via external terminals
- Continuous inventory including the storage locations
- Control of the conveyor system
- Control of the information displays for the operators

Storage strategies for optimised inventory management

The Demag warehouse management system modules can be adapted to specific customer processes. For this purpose, the system features storage strategies for optimised inventory management of the stored rolls of paper.

Mondi aims to create stacks containing only one type of material in the store. The system reports information on a roll to be stored to the warehouse management computer, including specific data such as the customer, paper grade, grammage, roll width and delivery date. The WMC consequently triggers a multiple-stage search for storage locations with optimum travel paths.

When the Mondi host computer requests a retrieval operation, the Demag warehouse management computer identifies the relevant rolls according to strategic criteria and triggers operation of the crane systems.

During periods with low handling rates, the warehouse management system prepares the retrieval operations for the following day. For this purpose, the crane installations also create new stacks, which make it possible to retrieve items quickly on shipping day.

The honeycomb storage pattern facilitates optimum utilisation of the available storage area.





Back to basics

Demag drive units as pacemakers in special carriage production

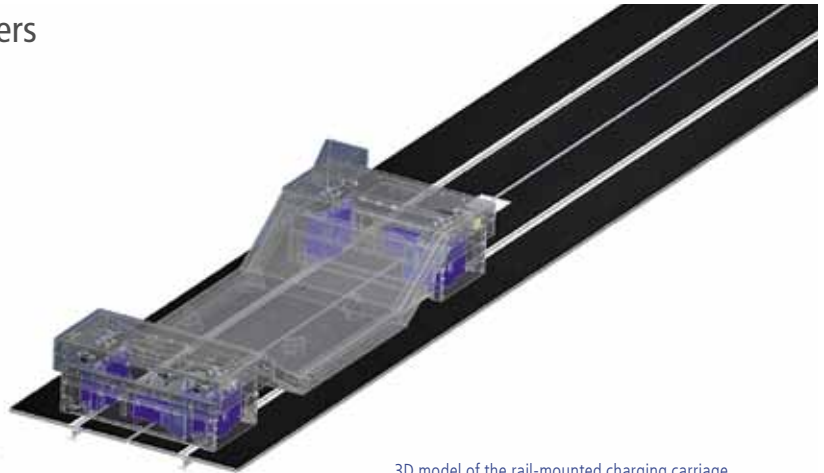
Gloria Fahrzeugbau Bierewirtz GmbH from Grevenbroich sets standards with its new charging carriage. The transport carriage was equipped with Demag drive units and replaces a transport carriage fitted with a chain drive. This tailored solution built on the basis of standardised parts demonstrates once more that even simple solutions often have the biggest impact.

The town of Grevenbroich has become well known thanks to the power generation sector. The town is located between Düsseldorf, Cologne, Aachen and Mönchengladbach on the edge of Europe's largest continuous brown-coal mining area and has a long industrial tradition. The Bierewirtz family established a small village smithy near its manor house in the year 1750. This was the predecessor of Gloria Fahrzeugbau GmbH & Co. KG, which is still owned by the family, and has been manufacturing special carriages and transport units in Grevenbroich since 1975. Flat-bed trailers for loads weighing up to 100 t for construction machinery, tandem trailers for transporting excavators and bulk materials, semi-trailers, self-steering trailer units for transporting concrete bridges as well as truck body systems and specially made outside broadcast vehicles are supplied from here. For virtually any unusual application, the specialist supplier develops, designs and manufactures the corresponding solution for special requirements.

One of the latest in-house developments is a rail-mounted charging carriage, which has been developed for moving scrap buckets. These carriers have a diameter of 3.40 m and are used together with cranes to serve furnaces with

materials for the manufacture of a wide variety of products made of aluminium. When it is full of various layers of recycling material which are blended during the loading process, this charging bucket weighs up to 40 t alone. The requirement was for the charging carriage to continue to use the existing approximately 10 m-long travel rail that is integrated into the floor. The design engineers at Gloria Fahrzeugbau developed a 6 m-long carriage solution with a flat-bed load surface. This solution enables the charging carriage to reach a maximum height of 3.90 m when it carries a load. By collecting aluminium in the charging bucket, the furnace can be fed direct with more than 30 t of recycling material. Energy loss is minimised as the furnace door only has to be opened once.

The transport carriage replaces a rail-mounted bucket carriage which has been in operation since 1960. Originally fitted with a chain drive, however, it was no longer up to meeting the constantly increasing requirements. This carriage was used in continuous operation for decades, often up to the limits of its load capacity. The impact loads that occurred when it was filled resulted in cracks in the carriage superstructure



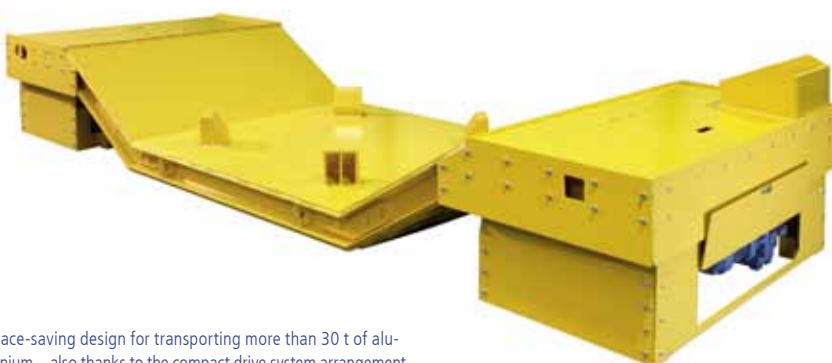
3D model of the rail-mounted charging carriage

over many years. A new design, which now has a leaf suspension similar to a truck, relieves the mechanical structure of the impacts that are unavoidable during loading operations. The new carriage also offers a much higher reserve load capacity – also thanks to the Demag wheel blocks.

Strong wheels for rugged applications

Demag Cranes & Components supplied the entire drive equipment and ensured that the new solution withstands both the static load that occurs during transport as well as the dynamic load that occurs during the filling operation. The travel speed was set at 13 m/min to enable the operator to accompany the charging carriage at walking pace and to control it. The initial idea to equip the carriage with frequency inverter-fed drives due to the high loads was quickly abandoned, since a further essential requirement specified that the operator has to be able to bring the transport carriage to a standstill by simply pressing a button. Under these circumstances, a very rugged application solution was needed that will also work in an arduous operating environment, which is particularly characterised by dust and heat.

In addition, the wheels had to be suitable for the existing rail system. The solution employs four DRS 500 wheel blocks that have a tread designed for a grooved rail, which ensures that the starting and braking properties are kind to the track. Special stiffeners provide for high rigidity. The wheel block housings are made of high-strength spheroidal-graphite cast iron and are enclosed on five sides to protect the travel wheels from any external influences. The Demag wheel block system also features a compact design for wheel loads of up to 40,000 kg. This also applies to complete drive units and the gearbox concept



Space-saving design for transporting more than 30 t of aluminium – also thanks to the compact drive system arrangement



The drive concept consists of four DRS 500 wheel blocks, two of which are driven by conical-rotor brake motors

which is designed to match the wheel load. This also caters to the specified maximum ground clearance requirement of 35 mm.

Modular drive system combination to meet individual needs

Demag modular drive system components consisting of motors and gearboxes for particularly smooth and precise acceleration, braking and positioning are precisely matched to the DRS wheel block range. The decision fell in favour of two KBF 100 conical-rotor brake motors with ADE offset gearboxes which operate in parallel on one rail. The two drive units have a deliberately simple, rugged and reliable brake system, which offers high braking energy and is not affected

by temporary overloads. The patented torque bracket enables the torque to be transmitted from the geared motor to the wheel block without any radial force. This reduces the load on the drive shaft and extends its service life.

Complete package as an attractive alternative

While Demag cranes have been in service at Gloria in Grevenbroich for a long time, the use of Demag components is a new development in the careful and precise handling of heavy loads. The first step was to visit the end customer together with engineers from the Drives Sales team to find out about the actual carriage drive system requirements. The trailer and carriage manufac-

turing specialists believe they also benefited from having the motors selected by the Demag drive experts, who provided a 3D model that was incorporated direct into the further planning and design work.



Agricultural machinery on the hook

Demag cranes for flexibility and reliability

The agricultural machinery manufacturer Bergmann has built a free-standing welding and assembly building as part of its overall business development concept. It is fitted with ten Demag single-girder overhead travelling cranes that operate on two parallel crane runways. There are no columns installed in the centre of the building, as the crane runways are suspended from the roof superstructure. This customer-specific solution, which represents a special overhead travelling crane application, provides its owner with a high degree of flexibility.

The welding and assembly building and its integrated crane installations are part of the company's long-term production concept. This is based on collaboration with the Fraunhofer Institute for Material Flow and Logistics (IML), in Dortmund, which developed an optimum material flow arrangement for Bergmann. The investment had become necessary because Bergmann had to expand the production capacities for its new generation of machinery, which measures up to 4 m in height. The result was a new building that measures 100 x 30 x 12 m (l/w/h). The ten single-girder overhead travelling cranes, which have load capacities of 4 and 2 x 3.2 t, operate on parallel runways at a height of 7.19 m.

They are used for the material flow and for all handling operations in the welding area and in assembly.

Focus on high flexibility

Bergmann places great emphasis on high flexibility in its new production facility. Thanks to the special solution, with which both crane runways are suspended from the roof in the middle of the building and not on central columns, Bergmann



Overhead travelling crane drive concept with Demag travel solutions and two-stage crane anti-collision system

benefits from a production area measuring 3,000 m² that can be used flexibly to meet changing production requirements.

All of the overhead travelling cranes have the same span dimension of 14.08 m. If the welding and assembly lines need to be re-arranged, a

crane can be transferred to the neighbouring bay. Both bays feature generously calculated designs so that additional cranes can be installed on the runways, if necessary.

The cranes travel at infinitely variable speeds of up to 60 m/min and the crabs at speeds between 5 and 30 m/min under frequency-inverter control. The compact DR-Pro rope hoist units position at speeds of 6 m/min and 1 m/min.

Maintaining a distance

Safety is guaranteed by the optical anti-collision systems installed on the overhead travelling cranes. They ensure that the 4 t cranes maintain a minimum distance of 4.50 m from each other and that those with a load capacity of 2 x 3.2 t do not approach closer than a distance of 5 m. Static design problems may otherwise occur if two adjacent cranes operate at their maximum load capacities.

The cut-off arrangements, which are based on the minimum distances, operate in two stages. In this way, the cranes maintain their specified minimum distance to neighbouring cranes at all travel speeds. Thanks to the two-phase cut-off arrangements, each crane already reduces its travel speed to 20 m/min at a distance of 7 m. It can still be positioned along the remaining specified travel path before it finally comes to a stand-



Precise control via the DRC-MP radio control system for hoists operated in tandem and as single units



still at a distance of 4.50 m or 5 m, respectively. This system enables the cranes to reach all specified target positions in the deceleration phases.

Reliable control system

The benefits offered by the Demag radio control system can be found in their ergonomic design, safety resulting from the distance between the operator and the load as well as in greater flexibility. In addition, the Demag technology makes it possible to control the ten cranes simultaneously by radio. This is based on reliable radio transmission which utilises mobile phone standards, bidirectional signal transfer which is highly resistant to interference and frequency hopping. Furthermore, the CAN-bus control system monitors all of the components. The Demag radio control system provides flexibility independent of the given location and a high level of transparency thanks to visualisation of the installation operating data.

Cranes specified according to the EU Machinery Directive

The cranes are also specified according to the new EU Machinery Directive 2006/42/EC. For static design reasons, Demag Cranes & Components

Reliable power transmission with the DCL conductor line



also classified the safety-relevant control functions of the distance-monitoring system to DIN EN 954-1 in control category 3 for the crane anti-collision arrangement. The sensor system features double channels and is monitored and evaluated by a redundant and diverse control system. All other safety-relevant control functions of the hoist units correspond to the provisions of DIN EN 14492-2.

Designed to meet future needs

The single-girder overhead travelling cranes are already designed to accommodate future agricultural machinery chassis weights of 3 to 4 t. The heaviest parts currently handled by Bergmann weigh 2 t. Six cranes, two of which have load capacities of 4 t, while the others each have two times 3.2 t, currently operate in the welding area, where robots join pre-tack-welded components to make up vehicle frames. The hoist units lift in synchronised operation to transport heavy and voluminous chassis parts to the next welding station.

The four other crane installations, which support assembly work in the parallel bay, were each supplied by Demag Cranes & Components with a load capacity of 4 t. In this part of the building, parts which first pass through the paint shop after they are welded are also pre-assembled. This was not possible in the past, as the company only manufactured along one line. In addition, depending on the given product, Bergmann can limit the assembly sequences to certain workplaces and then utilise the available workers for other tasks. Furthermore, the agricultural machinery can be optionally assembled along the line or at right angles to it, i.e. at workplaces arranged outside the assembly line.

Planning proved in practice

The new production concept at the Bergmann company has already proven to be a success in practice. All expectations for an optimum material flow and higher productivity have been met in full. In this respect, Bergmann also makes particular reference to the reliable work done by Demag Service. Above all, the employees who work in the agricultural machinery production bay quickly learned to appreciate safe load handling provided by the Demag technology after they had completed their crane operator training course.

+++ FACTBOX +++

Ludwig Bergmann GmbH

Ludwig Bergmann GmbH, which is a family-owned company now in the third generation, has been producing agricultural machinery since 1896. Today, it is a leading manufacturer of customised systems for professional agricultural operations and for farm contractors. The product range includes universal spreaders, forage transport and silage trailers, grain transfer wagons and special-purpose machinery, for example.

Bergmann offers machinery including all related technical developments in various sizes and supplies small farmers, as well as large machinery syndicates and agricultural co-operatives that farm several thousand hectares of land. The company has approximately 100 employees and manufactures exclusively at Goldenstedt in Lower Saxony. Its main markets are in central and eastern Europe.



Precision landing

Crane modernisation for Airbus in Germany

Instead of just trying to optimise single items, Airbus chose a complete solution to modernise an older double-girder overhead travelling crane that transports aircraft fuselage sections. The modernisation concept was developed by Demag Service and features high productivity and precise “landings” for positioning.

A fuselage segment floats through the assembly bay at the EADS subsidiary Airbus Operations GmbH in Hamburg-Finkenwerder, where the aerospace corporation assembles the fuselages of its Airbus aircraft. The assembly station is approached as required by the production cycle. For transport and positioning operations, the company uses a double-girder overhead travelling crane that was built in 1990 and which Demag Service has now brought up to date again.

The modernisation work has enabled the 33.9 m span crane to take a leap into the present. The changes had been inevitable. Although the mechanical parts of the crane are still state-of-the-art, this did not apply to the previously used DC drives. Before the modernisation work was carried out, the operating sequences had to be monitored by the workers and destinations had to be approached under manual control. That cost time and increased the length of the operating cycles.

Modernisation for added value

Following an analysis, Demag Service presented Airbus in Germany with a strong overall concept to modernise the crane. The main benefit for the aircraft manufacturer is to be found in the shorter cycle times for handling the various fuselage segments – and, therefore, in higher productivity.

Semi-automatic positioning in nine axes

This added value is also based on the ability of the crane and the crab to achieve semi-automatic positioning in nine axes. These axes comprise the long and cross-travel motions, the crab turning mechanism, as well as the motions of the two traversing cranes and the four travelling hoist units that are installed on the turning mechanism. All motions are performed quickly, reliably and with maximum precision under inverter control.

The significantly increased travel and lifting speeds also paved the way for faster operating cycles. The crane travel drives now operate at speeds of 0.6 to 60 m/min, which represents an increase of 20 % per cent. Speed increases of up to 150 % were achieved by the hoist units, which operate at speeds that are dependent on the load.

Further benefits provided by the modernisation work are to be found in higher availability and guaranteed spare part supplies.

The controls of the modernised double-girder overhead travelling crane and its crab correspond to control category 3, which, according to DIN EN 954, Part 1, requires a redundant monitoring function that was implemented by means of a safety-related control system. The customer also benefits from the experience provided by Demag Cranes & Components, for example, by allowing the crab to bypass the spray booths in both corners at one end of the bay to apply preservative to the fuselage segments.

Frequency inverters for all motions

The travel motions of the crane and the main crab, which covers a base area of 9 x 12 m, as well as its lifting, adjusting and turning motions



are controlled by a Dedrive-Pro frequency inverter. This enables all positions to be approached carefully and at variable speeds. The main crab, which is fitted with two travel drives, achieves speeds of 0.6 to 30 m/min. Mounted on its turning mechanism are two suspension cranes, which travel at speeds of 3.15 or 12.5 m/min and are each fitted with two travelling hoists. These four travelling hoists, which travel at the same speed as

be moved in a rectangle measuring from 1.2 x 1.58 m to 10.5 x 6.2 m. Lasers are used for position measurement of the long and cross-travel motions and barcode lasers are used for the turning mechanism. When the load reaches the destination, the operator can lower it by manual radio control on one or all of the hoist units, depending on the component.

Hoist units in synchronised operation

The hoist unit speeds are controlled depending on the load and the selected mode; the speed is 0.1 m/min for creep lifting, for example. In addition, the hoist units operate with a travel latching mechanism for the adjusting drives, which Airbus controls via a PLC and interface modules. Furthermore, the lifting motion is synchronised as soon as a weight of 500 kg is suspended from all of the wire ropes. The Demag hoist units were kept as reserve hoist units at the customer's facility and have now been fitted with new cross-travel drives. They are still used in order to retain the previous approach dimensions and, therefore, all of the functions.

The safety devices on the travelling hoist units also include electronic overload protection with a load display, a rope tensioning switch, an operating limit switch for the highest hook position and photoelectric sensors that measure contours to limit the lifting path.

Guaranteed deadline despite tight schedule

Before it was installed, Demag Service pre-assembled and tested the new crab. The customer's production operations were not allowed to be compromised while it was being installed. For this reason, an intermediate level was installed

Pre-assembly work on an intermediate platform



Added value for the customer thanks to shorter cycle times

the suspension cranes, each have a load capacity of 4 t. Their maximum joint load capacity is limited to 9.4 t and, in certain areas, to 4 t.

The fuselage segments to be transported are attached to the hooks by hand. To enable the assembly stations to be approached quickly and precisely, addresses have been assigned for the positions to be approached, which can be pre-selected via the crane control system. A worker has to keep a safety button pressed while the crane then approaches the relevant point in semi-automatic mode.

The crane is highly flexible with reference to the segments to be handled. For example, the positioning system can be adapted to new situations and the load hooks of the four hoist units can



Crab equipped with turning mechanism and four hoist units

in the bay, where the turning element of the crab was first assembled and then lifted under the fixed part of the crab.

The crane modernisation work was completed within three weeks; the team was already involved in the project engineering phase. Chal-



Successful modernisation by Demag Service

lenges were posed by the tight schedule, the highly complex assembly procedure and in implementing the new control system according to category 3.

Maintenance agreements also ensure high availability of the crane. In any case, a permanent team from Demag Service is always on hand in Hamburg-Finkenwerder also to carry out service work on third-party cranes and roller doors, for example.

Airbus selected its partner for the modernisation work due to its outstanding concept. Demag Service had already demonstrated its abilities when it modernised a neighbouring crane four years earlier.



New size up to 3,200 kg

Demag DC-Pro 15 chain hoist

Extension to the DC chain hoist range: The DC-Pro 15 hoist provides customers with optimum value for money in the load range up to 3,200 kg. Classification in FEM 2m+ ensures that its service life is extended by 20 %, thus offering the owner improved cost effectiveness.

The DC-Pro 15 is positioned between the DC 10 and DC 16 size units. It is based on the electric drive and control concept of the DC 10. Two lifting speeds provide for fast and also smooth operation:

- DC-Pro 15, 1,000 kg: 2 and 8 m/min
- DC-Pro 15, 3,200 kg: 1 and 4 m/min

10 years maintenance-free

The DC 15 also benefits from the properties of the DC-Pro chain hoist range. Its gearbox is maintenance-free for up to 10 years. The market launch of the first units in the range with the Demag 2m+ classification and a rated service life of 1,900 hours at full load set a new standard for compact hoists.

The double-encapsulated brake operates with minimum wear, as it does not need to be adjusted.

The slipping clutch fitted behind the brake in the drive arrangement offers reliable protection against extreme overload thanks to an integrated speed monitoring function. In addition, the slipping clutch is maintenance-free for up to 10 years.

The DC 15 is fitted with a proven 24 V contactor control system. An elapsed operating time counter and its diagnosis interface make it possible to read out the current operating status. This enables maintenance breaks to be planned.

Robust design

Like all other units in the DC range, the housing of the DC 15 chain hoist consists of robust and weight-saving die-cast aluminium with powder coating.

The galvanised round steel chain, which has a hardened surface, offers protection against aggressive media. Up to a hook path of 8 m, it is stored in a flexibly suspended chain collector box that is made of impact-resistant plastic. Chain collector bags for lengths up to 40 m as well as special lengths up to 120 m can be supplied as an option.

Thanks to generous dimensioning of its gearbox housing, the DC 15 is already prepared for operation as a double chain hoist. This makes it possible to implement transport solutions with mechanically synchronised lifts at two points, e.g. for transporting long materials.

Simple commissioning

A further feature includes its user-friendly plug-in connections. Plug & Lift and Plug & Drive facilitate rapid commissioning of the chain hoist and, if maintenance has to be carried out, short downtimes.

The height-optimised bracket for flexible suspension enables the chain hoist to be connected direct to a support superstructure. This arrangement improves the C dimension – as does the compact 2/1 reeving design of the bottom block.

Control variants

Integrated flexibility: The chain hoist is fitted with the DSC control pendant for smooth lifting and lowering. For two and three-axis motions, the chain hoist is equipped with the DSE 10-C control pendant. The length of the control pendant cable can be individually set by the owner and, therefore, adjusted to changing conditions on site.

In addition, Demag Cranes & Components offers a convenient and wireless control system with its DRC-DC radio control.



DC-Pro 15/3,200 kg chain hoist

Standard travel solutions

Demag Cranes & Components offers trolleys that can be adjusted to variable flange widths for connection to cranes and profile girder sections. The trolleys, which are graded in four sizes and rated for loads weighing up to 5,600 kg, facilitate smooth travel with low travel resistance. In connection with their electric travel drives, they provide for low-sway handling with smooth starting and braking.

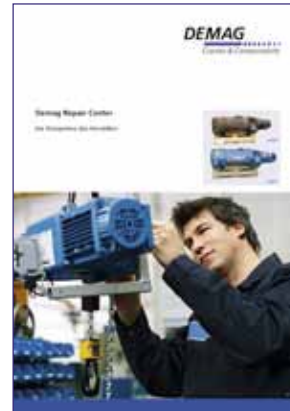
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Demag wheel systems – to keep your loads on the move

Demag wheel block and travel wheel systems are the right choice for materials handling applications – as robust and compact solutions for a wide range of load capacities. High-quality wheel housings provide many connection options to meet individual customer design requirements. Ready for installation and proven in many applications, these systems offer simple assembly and are available as complete travel units together with Demag geared motors. You can find on-line project-engineering support for rapid selection and configuration as well as CAD models to facilitate design work on Demag wheel systems in the Drive Designer section of the Demag Designer tool portal at www.drivedesigner.com.



Demag DRS wheel block system

- Eight sizes: from DRS 112 to DRS 500
- High load capacities up to 40 t
- Individual designs
- Many connection variants: top, pin, end and side connection

Demag LRS travel wheel system

- Three sizes: LRS 200, 250, 350
- Universal solutions for loads up to 6.5 t
- Travel speeds up to 240 m/min
- Two travel wheel variants: spheroidal graphite cast iron wheel with two flanges and travel wheel with Hydropur tyre