

## Floating Cranes



## Gottwald Floating Cranes New Approach for Ship-to-Ship Transloading, Mid-Stream and Ship-to-Quay Handling

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**Gottwald  
floating  
cranes  
prove  
popular for  
bulk  
handling**



# Riding a wave of success

The Mississippi, mother of all rivers. In 1884, Mark Twain set Huckleberry Finn afloat on a raft and sent him down river on an adventure. One hundred and twenty years later, on this same river, Gottwald has set its proven mobile harbour crane technology afloat on a barge. And it is now riding on a first wave of success with this concept.

With the floating crane, developed together with a customer on the Mississippi in Louisiana and launched onto the market in 2004, Gottwald has once again demonstrated that it is living up to its reputation as an innovator in crane technology. Having introduced the mobile harbour crane, mounted on a rubber-tyred chassis, to the market 50 years ago, Gottwald innovatively combined this proven technology — used to date in over 1,000 cranes — with rail-mounted portals to create the portal harbour crane at the end of the 1990s. The development at that time also occurred in close co-operation with a customer, which is also located on the banks of the Mississippi in Louisiana.

With the entry of the Gottwald floating crane, Gottwald now makes its proven technology available on water as a harbour pontoon crane or a portal harbour

crane, mounted on a barge, permitting cargo handling mid-stream free of the bounds of quay structures. And the latest of the Gottwald harbour cranes is not only impressive in transloading cargo on rivers and in mid-stream. Since the market launch in 2004, Gottwald has commissioned or taken orders for seven floating cranes, used in various waters and also on the quay. These include three HPK 330 EG harbour pontoon cranes on the Mississippi (USA), two HSK 330 EG portal harbour cranes on barges in South Carolina (USA) and two new Generation 5 G HPK 8200 B harbour pontoon cranes, one in the port area of Amsterdam (Netherlands) and one for use in the coastal waters of South-East Asia respectively. All cranes are intended for professional bulk handling and thus designed in the Gottwald four-rope-grab variant that has proven itself time and again.

#### THE ENVIRONMENT

Developments and successes which, as far as Gottwald is concerned, have not occurred by chance. “It has always been part of our strategy to develop new markets and applications,” states Giuseppe Di Lisa, sales director at Gottwald. “We continuously analyze the global flow of

*This G HPK 8200 B harbour pontoon crane is seen handling coal at Rietlanden Stevedores’ terminal in the Port of Amsterdam.*

# Gottwald floating cranes

Gottwald floating cranes combine mobile harbour crane technology with a barge and can be designed as:

- ❖ harbour pontoon cranes: the crane is on a pedestal mounted on an individually designed barge.
- ❖ portal harbour cranes on a barge: the crane is mounted and travels on an individually designed barge.

The various solutions are developed to meet the requirements of the respective fields of application.

From the slew ring upwards, all Gottwald floating cranes have the same assemblies as

Gottwald mobile harbour cranes. The barge is specially adapted to comply with customer requests. Floating cranes can be designed in all available variants, naturally also as a four-rope-grab crane for professional bulk handling.

Due to the high lateral forces created by operation on water, floating cranes must be designed with heavy-duty booms to effectively counter heeling. Gottwald floating cranes are also classified in appliance group A8 according to F.E.M. 1.001, and thus, in terms of their mechanical and structural steel design, construction and condition, they are designed for a high service life to meet the highest demands.

goods. It is a question of preparing ourselves in time to accommodate the developments on the world market. Our floating cranes are a response to the forecasts.”

On the world's oceans, more and more cargo is being transported on ever larger ships. For the coming years, growth of around 9% a year is anticipated in container handling alone. In the field of bulk handling, important markets such as coal are also growing.

However, in many cases it is already no longer possible to handle the increasing cargo volume with the port and terminal structures as they are today. Quays have reached their limit in space; berths can no longer accommodate the growing size of ships. Bottlenecks in ship traffic occur and the handling performance demanded by the customer cannot always be achieved. No one can afford to not meet the new demands. Ports that wish to stay in competition must respond and develop additional capacities. However, investment in the appropriate infrastructure is a major financial obligation for many operators. Additionally, solutions that enable a flexible response to fluctuations and market developments are in demand.

## AUTONOMY IN CARGO HANDLING

Put in this context, floating cranes become ever more attractive. They are so much more than the necessary equipment for transloading cargo on water where handling is not possible in any other way. Thanks to their autonomy, low specific investment costs and short delivery lead times, floating cranes offer many advantages. High investment costs for site purchase and quay construction, as well as long approval procedures and construction times, can be avoided with the purchase of a floating crane.

In addition, floating cranes can also back up landside cranes in order to ease peak times. And in shallow-draught berths, a floating crane can be positioned between the ship and the quay to bridge the shallow point. It takes on the role of a mobile harbour crane and performs quayside handling. It is thus unnecessary to perform costly modifications to the infrastructure. Therefore, this is also an ideal solution for ports still under construction.

## GOTTWALD FLOATING CRANES

Yet floating cranes themselves are not a new invention and the potential advantages do not bring any benefits if the cranes do not satisfy all the requirements of an operator. “It is not just a question of recognizing new markets, but also having the far-reaching vision to develop and build on these to the advantage of the customer,” says Di Lisa. Only modern, high-performance equipment gains a competitive edge. And this is where the Gottwald concept, which is oriented towards the individual requirements of the operators, comes in.

Gottwald harbour crane technology, proven 1,000 times over around the world, and many decades of experience in design and production, having earned a high level of customer satisfaction thanks to excellent performance in the field, provide the right ingredients for this leading-edge technology. The Gottwald-typical diesel-electric drive technology can be mentioned here as example, or the four-rope-grab crane for professional bulk handling, over 170 of which have been sold. At the beginning of 2006, a further advance was brought by the new harbour cranes of Generation 5 which include mobile harbour, portal harbour and harbour pontoon cranes. With an unprecedented range of versatile variants, high level of service-friendliness, high lifting capacities, tailored drive performances and hoisting speeds, the new harbour crane generation continues to maintain the excellent reputation already gained by the HPK and HSK models on barge with the new G HPK and G HSK models on barge. The new generation of harbour cranes also boasts many innovative features, e.g. remote control, the Visumatic crane management system, a highly positioned tower cab or the video system that supplies images from the boom head to the monitor in the tower cab.

## THE BARGE

For the best possible solutions with floating cranes, Gottwald combines its own crane know-how with the know-how of third-party professional barge manufacturers. The customer can choose to order a new barge or to convert an existing one. If required, Gottwald works as a general contractor. The size and

design of the barge can be adapted to own requirements. In addition to the crane parameters, any further equipment and resources required by the operator must be taken into consideration, e.g. the tank for propelling the barge under its own power, winches, storage area for lifting gear, tools and other material and, if necessary, accommodation for the crew.

The barges of the harbour pontoon cranes are usually fitted with a pedestal on which the crane is mounted. Gottwald normally only supplies the crane from the slew ring upwards, but will also manufacture the pedestal upon request. Portal harbour cranes on barge are fitted with a rail-mounted portal manufactured by Gottwald.

#### ONE IDEA — MANY FIELDS OF APPLICATION

Ultimately, Gottwald floating cranes — like all Generation 5 cranes — offer solutions tailored to customer needs. Operators receive a crane customized precisely to meet their requirements based on crane models manufactured according to a uniform design principle and sharing many common parts, combined with a barge customized precisely to meet their needs. This concept allows operators to use these cranes for a variety of applications, ranging from transloading on rivers in mid-stream operation to cargo handling in coastal waters, and from ship-to-ship transloading to ship-to-quay handling. The seven cranes commissioned or ordered to date demonstrate the variety of possible applications.



*In 2004, Gottwald developed its first HPK 330 EG floating crane with St. James Stevedoring at the Port of Louisiana in the US. St. James has recently put its second HPK 330 EG into commercial operation.*

#### THREE HPK 330 EG HARBOUR PONTOON CRANES FOR MID-STREAM OPERATION

At the third-largest port in the world, the Port of Louisiana, Convent, USA, not far from New Orleans, at the point where the Mississippi almost reaches the Gulf of Mexico, Gottwald has now commissioned or taken orders for three HPK 330 EG cranes for two major cargo handling companies. Just very recently, St. James Stevedoring Co., L.L.C. (St. James), with which Gottwald developed the first floating crane in 2004, began commercial operation with its second Gottwald HPK 330 EG. The commissioning of a further HPK 330 EG for the neighbouring Associated Terminals cargo-handling operation is planned for the end of November 2006.

The Port of Louisiana covers an area of approximately 80km (50mi) and is an important trading hub for the southern states in the US. With the help of floating cranes, cargo is transloaded from sea-going vessels to small river barges and vice versa. Day in, day out, the river barges travel inland throughout the 22,500km (14,000-mi) river system to collect freight and transport it to its destinations. An important link in this distribution network is the floating cranes. Major handling operations such as St. James and Associated Terminals are extending and modernizing their fleets with the new Gottwald cranes and regard them as a

## One idea – many fields of application

Gottwald floating cranes are used for

- ❖ mid-stream ship-to-ship handling
- ❖ ship-to-quay-handling (quay handling)
- ❖ on rivers (in mid-stream operation)
- ❖ in protected waters
- ❖ in ports
- ❖ in coastal waters

and are suitable for handling

- ❖ bulk
- ❖ containers
- ❖ general cargo

## Highlights of Gottwald's floating cranes

- ❖ irrespective of quays, they can be used everywhere in the port and on the water
- ❖ ports can serve more and larger sea-going vessels (transloading to lighters in shallow-water ports, quay-to-ship handling at shallow-water berths, cargo-handling as a back-up to landside-handling equipment)
- ❖ lower costs for quay infrastructures
- ❖ low specific investment costs
- ❖ with ship-to-ship handling relatively low radius required
- ❖ high classification in A8 as per F.E.M. for long service life
- ❖ short delivery lead times
- ❖ high resale value

significant technological advancement for their cargo-handling business. The three Gottwald cranes designed as four-rope grab cranes handle many types of bulk including coal, in continuous handling operation under extreme conditions, achieving performance rates up to 1,000tph (tonnes per hour), depending on conditions.

These three cranes also demonstrate how individual

the design of the barge can be. While the pontoon on the first St. James's crane has a size of 65m x 22m x 4.5m (213ft x 72ft x 15ft), the second St. James' crane has a larger barge of 76m x 22m x 4.9m (250ft x 72ft x 16ft) with more storage area. In both cases, these are used barges that have been adapted. Associated Terminals is also using a used barge, which is even larger, with a size of 82m x 22m x 4.5m (270ft x 72ft x 15ft).

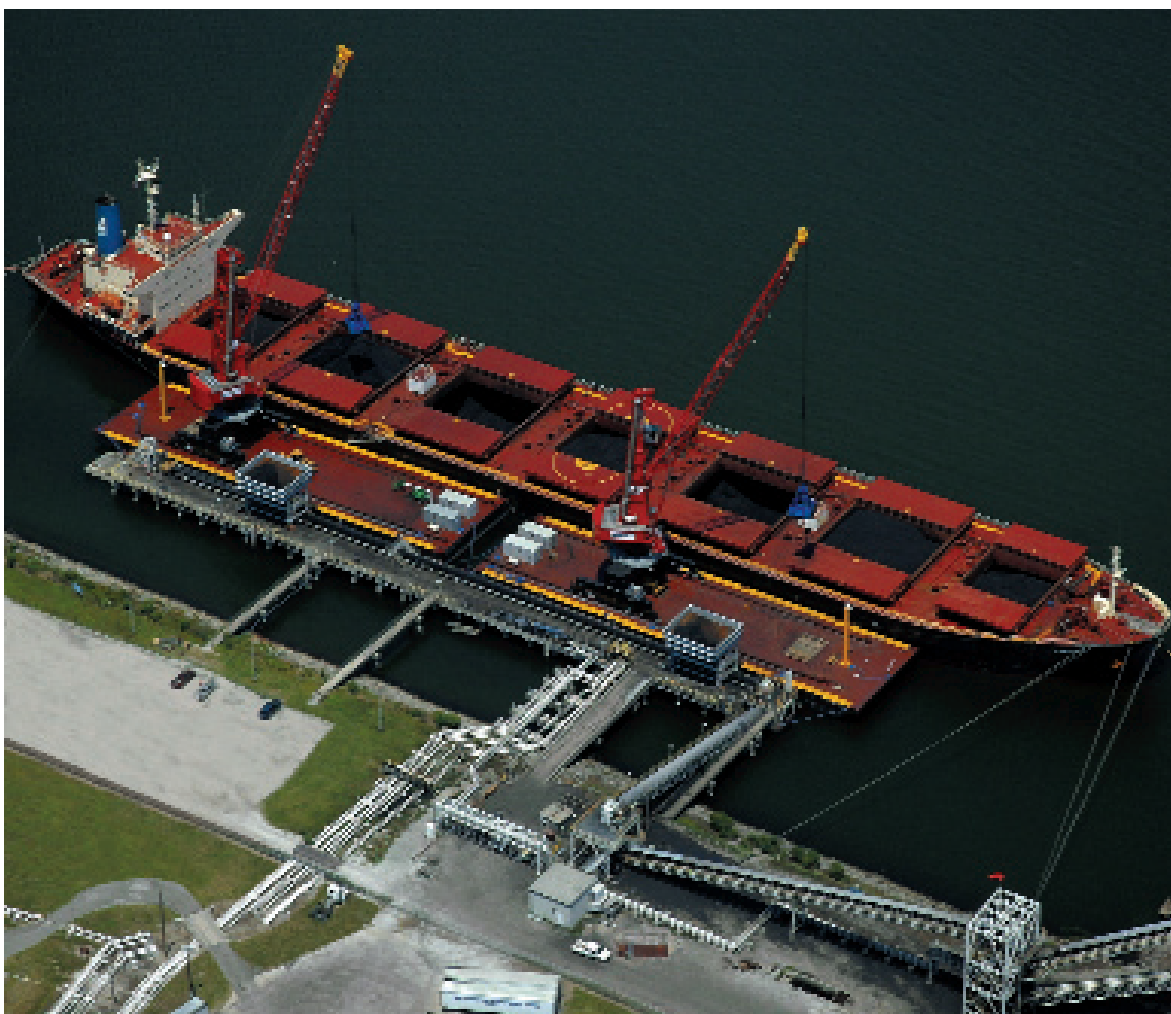
### FOR GREATEST POSSIBLE FLEXIBILITY – PORTAL HARBOUR CRANES ON BARGES

Since June 2006, Shipyard River Terminal, a subsidiary of Kinder Morgan in Charleston, South Carolina, USA, has been operating two Gottwald HSK 330 EG portal harbour cranes on barges. In the terminal on the Cooper River on the East coast of the USA, coal is handled for transport to local power plants.

With the portal harbour cranes on barges, Gottwald was able to meet the customer's request for the greatest possible flexibility. On the one hand, the two HSK 330 EG cranes can travel on water thanks to their barges and transload coal mid-stream from large vessels to small river barges for further transport. On the other hand, the floating cranes can also dock at the pier, at which hoppers and a conveyer belt are installed, to further transport the coal over land. It is also possible to moor the floating cranes to the quay to directly unload the coal onto the quay.

If the two floating cranes are used on the pier, they are moored alongside each other so that they can both work on a vessel at the same time. Since, in turn, it is

*Two HSK 330 EG portal harbour cranes mounted on a barge, handling coal in Charleston, South Carolina, USA. So that the crane remains in a level position while travelling on the barge, a special rail structure was designed.*



expected that each of the cranes also serves various ship's hatches, portal harbour cranes that travel to and fro on barge were selected to meet requirements. The two HSK 330 EG cranes have a track gauge of 13.4m (44ft). At 3.7m (12ft), the portal height is also comparatively low, thus ensuring a low centre of gravity.

To ensure that the crane remains balanced while travelling to and fro on the barge, the rails were raised at the two ends of the barge. Thus, when the crane travels to the end of the rail, causing the barge to be seated lower in the water on one side, the crane nevertheless remains balanced.

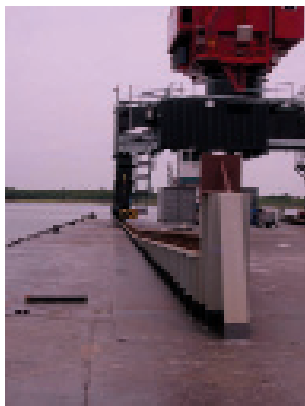
Therefore the barge sits lower in the water, but the crane remains balanced. In the centre of the barge, the rails are horizontal. Toward the sides of the barge, the rail height increases at a constant rate over a length of 15.8m (51ft 9in). In the centre of the barge, the lower edge of the rail has a height of approximately 18cm (7in) above the deck, approximately 51cm (1ft 7in) at the end. As with all floating cranes, this barge was supplied by a professional manufacturer. The design specified a barge with a size of 72.5m x 19.5m x 3.6m (238ft x 64ft x 12ft).

The HSK 330 EG cranes, designed as four-rope-grab cranes, achieve handling rates of up to 1,100tph depending on circumstances. In addition to the Gottwald-typical diesel-electric drive, both cranes have equipment for external power supply, so that they can use energy from the shore mains supply at any time when they are docked on the pier or quay.

#### FIRST GENERATION 5 FLOATING CRANE — G HPK 8200 B IN THE PORT AREA OF AMSTERDAM

The first Generation 5 floating crane, a G HPK 8200 B with a 50-tonne grab curve, went into operation in July 2006 in the Port of Amsterdam in The Netherlands. This is also the first Gottwald floating crane in Europe. The Port of Amsterdam is a significant coal transshipment site, mainly transloading imported coal destined for central European power plants. The crane operator, Rietlanden Stevedores, offers cargo handling services for coal and scrap; however, approximately 90% of the services relate to coal. Approximately 6 million tonnes are handled annually here at two terminals, in future, at three terminals, and then in the whole port area. As part of the capacity expansion, the new G HPK 8200 B was acquired to complement the floating crane fleet. Maximum flexibility was also demanded here, since at Rietlanden, floating cranes assume 60% of all the work, both in direct transloading of cargo from sea-going vessels to barges and in indirect handling via the terminal.

On the one hand, the crane located in the protected waters in front of the locks lightens large sea-going vessels which, due to their draught, cannot enter into the North Sea Canal, and the harbour area. At this point, the floating crane transloads coal onto barges that transport the cargo to power stations along the Rhine. The lightened vessels can then travel through the locks via the North Sea Canal to the Port of Amsterdam. The



G HPK 8200 B is just waiting for new fields of application. On the one hand, the floating crane in the harbour basin can again transload coal from sea-going vessels to barges. Alternatively, the crane can also moor at the quay in order to directly transfer cargo to the shore.

The barge has a size of 50m x 24.6m x 4m (164ft x 81ft x 13ft). It is equipped with winch systems to allow the floating crane to be towed alongside a ship or river barges to be towed alongside the crane barge.

Like all Generation 5 cranes, the G HPK 8200 B also has a spacious double-storey superstructure. Thanks to the headroom of 2.5m (8.2ft) per floor, maintenance work can be performed standing upright in the superstructure and all machines, drives and electrical equipment are easily accessible. The high

tower with higher and forward-positioned tower cab provides a good view of sea-going vessels. The crane is also equipped with three cameras and two monitors in the tower cab. Two cameras on the boom head provide a total picture of the ship and a focussed view of the grab. There is also a radio-controlled camera installed directly on the hatch. This camera transmits a further image onto the monitor in the tower cab via radio.

#### G HPK 8200 B IN COASTAL WATERS

A further G HPK 8200 B for professional cargo handling is scheduled to go into operation in Southeast Asia in spring 2007. With this order, for the first time, a Gottwald floating crane will be able to provide proof of its suitability for coastal waters, where weather conditions with windforces of up to 6 on the Beaufort scale and wave heights of up to 1.5m (4.9ft), can occur. This crane is also intended for coal handling.

#### FURTHER APPLICATIONS — CONTAINER HANDLING TOO

With these orders, Gottwald floating cranes, having passed the first practical tests in the field, are an attractive alternative to the landside crane in bulk handling. This will not remain the only speciality of Gottwald floating cranes, and Gottwald emphasizes container handling as another potential field of application. At peak times, for example, floating cranes can complement landside handling equipment and thus increase capacities, which is particularly interesting in view of the growing size of container ships. While unloading takes place as usual on the landside, floating cranes can be used additionally on the waterside to place containers on their own or on a separate barge in order to then transport them to land, to store them temporarily or to directly transport them further. The first thoughts about different fields of applications reveal the multitude of possibilities opening up for floating cranes.

“Following the portal harbour crane, the development of harbour pontoon cranes and their specific modifications illustrate once again the innovative power of Gottwald, the capability of actively taking on customer requests and implementing them in close co-operation in customer-based solutions,” says Di Lisa.

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*For rail-mounted portal harbour cranes operating on a barge, the rails are raised at the two ends to ensure the crane remains balanced.*