

For Port, Stackyard and Intermodal Cargo Handling
Wide Span Gantries

From the High Seas to the Heartland

Meeting Logistical Challenges Efficiently



Gottwald Port Technology provides exactly the right equipment for efficient and cost-aware cargo-handling in state-of-the-art terminals

Ever greater volumes of container-packed goods are being transhipped across the oceans in vessels of increasing dimensions with a view to being transferred to other vessels, freight trains or heavy goods vehicles (HGVs) at international terminals. The constantly increasing density of road-traffic and the associated additional costs are making road-based distribution less attractive –

with a resulting shift towards higher volumes on inland waterways and freight trains.

The volumes of cargo transported in this way are steadily growing – as is the number of scheduled links between large maritime ports and inland conurbations. This development demonstrates clearly that inland transport on waterways and freight trains provides a highly efficient and cost-effective alternative to road transport.

To cater for this shift in emphasis, innovative solutions and reliable, high-performance cargo-handling technology are required. Gottwald Port Technology, a subsidiary of Demag Cranes AG, is right on track –

as the world market leader in Mobile Harbour Cranes with some 1,300 units already sold, and as a respected and leading supplier of networked, computer-controlled transport systems. This reputation forms the foundation on which Gottwald develops state-of-the-art cargo-handling equipment which effectively responds to these logistical requirements.

Gottwald Wide Span Gantries
One such Gottwald Port Technology product is the WSG series of Wide Span Gantry cranes. These machines are typical for Gottwald's consistent approach to providing efficient, economical cargo-handling solutions in the shape of sophisticated products and services, with a view to meeting the specific requirements of modern ports.



Container transport is a crucial factor in world trade

Transporting containers to their destinations inland on inland waterways ...



... or by rail, is of growing importance



Gottwald Wide Span Gantries

Designed To Cater for the Most Diverse Applications



Gottwald Wide Span Gantry at Swissterminal in Birsfelden, Switzerland

For many decades, Gottwald has been manufacturing cranes of various types for many diverse applications and has continued to expand its product range. Gottwald's Wide Span Gantries also benefit from these years of experience in developing and manufacturing cargo handling equipment.

Wide Span Gantries as used at riverside and railway terminals have been specifically designed for handling:

- containers
- swap bodies
- semi-trailers.

However varied the range of cargo types, Wide Span Gantries provide optimised solutions for all these applications. Gottwald WSGs are used for:

- intermodal handling between rail and road
- trimodal handling in barge terminals between vessels, freight trains and HGVs
- container stackyard management as manual or semi-automated solutions.

Combined Lattice and Box-Girder

Gottwald WSG have a combined lattice and box-type design. While the gantry bridge is designed as a lattice construction, the fixed and hinged portal legs are constructed as plate-box girders.

The lattice construction has a height of over 6 metres, which provides the gantry bridge with remarkable bending rigidity. Despite the length of the lattice construction, the total surface area exposed to the wind remains small and enables WSGs to operate safely even under extreme wind conditions.

Due to the overall design concept, the weight of the construction is low, which, in turn, reduces energy overheads and keeps foundation construction to a minimum.

WSG Highlights at a Glance

- Reduced delivery lead times due to standard modular components
- Short assembly times on-site due to flanged joints in the lattice construction
- Innovative, low-maintenance braking concept
- Low-noise handling due to sophisticated noise damping techniques
- Antisway bracing-rope system with reduced rope deflection sheaving
- Rapid access to containers in the stack due to semi-automated travel-to-target function
- Future-orientated data processing system
- Further improved availability using Teleservice
- Excellent view of job site due to high-up seating position and one-piece windscreen
- Easy-to-use controls due to Visumatic® operator guidance
- Optional process control system allows multiple WSGs to use a common craneway

Wide Span Gantries at Inland Ports

Designed to Deliver

Transporting containers on inland barges is an attractive alternative to using the roads. This mode of transport benefits more than any other from low running costs and a well-established network of waterways reaching into the heart of many conurbations. Inland terminals as integral nodes in such transport networks require particularly versatile and economical handling equipment.

Wide Span Gantries Cater for all Container Moves

Wide Span Gantries made by Gottwald Port Technology meet these requirements in every respect. With their cantilevers of up to 40 metres in length, WSGs can either twin-lift two fully laden 20-ft containers or single-lift one 40-ft container onto or off the usual inland barges and smaller ocean-going vessels, or tranship them from one to the other. Gottwald WSGs are ideal for stacking containers in stackyards and transferring them at a later date to HGVs and freight trains for transport to their final destinations.



WSG noise reduction system for operation in densely populated areas

Low-Noise, High-Performance Handling

Inland terminals on rivers and canals are often located in heavily populated areas. To keep noise to a minimum, Gottwald has equipped its WSGs with a noise-damping system.

To this end, emphasis has been placed on these features:

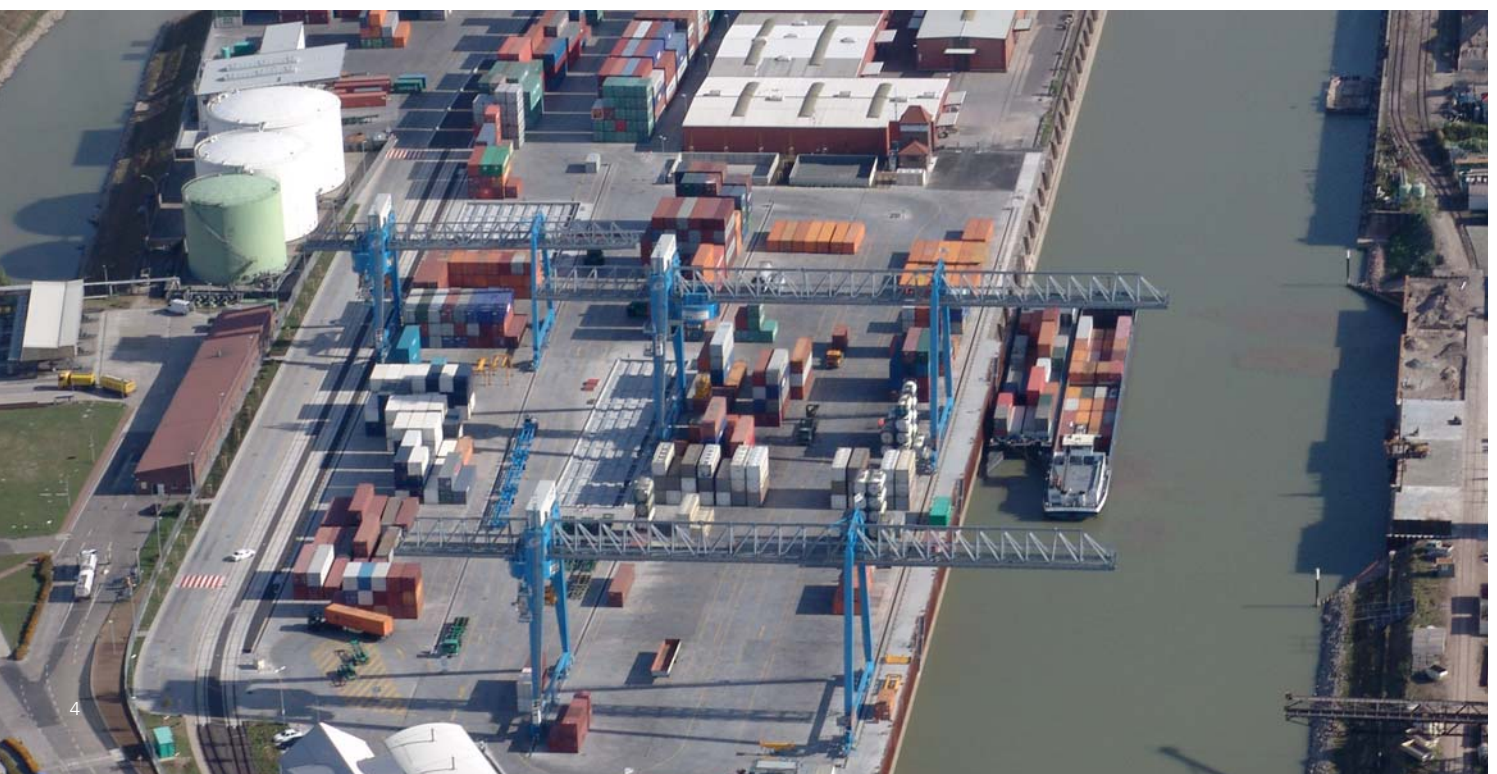
- travel gear motors without fans
- synchronised travel gear units
- physical separation of the resonance body and the hoist units
- power supply to the trolley uses low-noise flexible cable ducting
- sound insulation for the hoist level.

In addition, the trolley itself is mounted on rails which prevent the transfer of noise to the lattice construction.

WSGs in Multi-Purpose Terminals

Wide Span Gantries as used at inland terminals are not restricted to handling containers. Equipped with a wide range of lifting equipment or motorised grabs, they can move steel girders, general cargo and bulk materials just as efficiently and economically as they can tranship containers.

Two WSG quayside cranes logistically networked with WSG stackyard crane at Contargo, Port of Ludwigshafen, Germany



Wide Span Gantries for Stackyard Management

High-Density Container Stacking and Rapid Access



Travel-to-target capability due to interaction with stackyard management system

The increasing volumes of container traffic have been felt not only in the larger maritime ports but also at smaller and medium-sized terminals around the world. These terminals often make use of Mobile Harbour Cranes to handle cargo, which may be in the shape of containers, general cargo, bulk materials or project cargo. In many cases, the amount of space available for stacking containers is seriously restricted, which means that capacities are quickly exhausted.

This is where Gottwald's Wide Span Gantries dramatically increase storage capacity by increasing container stacking density. With container stacking heights of up to one over five, this can often mean a doubling of the storage capacity compared with conventional stacker alternatives.

Rapid Access

Despite this more dense storage method, Gottwald's WSGs are able to access all the containers in the stack far more rapidly. If the target slot is predefined by a stackyard management system, the WSG can approach that slot directly in its semi-automatic travel-to-target mode. This is achieved by the absolute position detection system built into the crane positioning system.

WSG Wide Span Gantries at Inland Terminals

With their bridge widths of up to 80 metres, Gottwald's Wide Span Gantries generally provide sufficient storage space directly beneath the machine. If additional capacities are required, WSG stackyard management cranes with the following features are used:

- logistically networked with the cranes on the quayside
- able to take on the loading and unloading of HGVs and freight trains.

Gottwald WSGs increase stacking density and overall capacity of container yards



Gottwald WSGs as stackyard management cranes complement Mobile Harbour Cranes as unloading cranes; also at semi-automated Compact Terminals

Gottwald WSGs at Intermodal Railway Terminals

Multitasking with Wide Span Gantries



Gottwald's WSG Wide Span Gantries are integrated in existing stackyard management systems

Railway traffic between inland locations and maritime ports, and between economically important regions, is gaining in importance. In these situations, cargo is transported in:

- containers
- swap bodies
- semi-trailers.

Providing bridge widths of 20 metres to 80 metres, Gottwald Wide Span Gantries can be easily built to meet the precise requirements of each individual railhead. In this way, it is possible not only to service multiple railway lines but also to store transport units beneath the crane.

Cost-Saving Bracing-Rope System

The patented antisway bracing system used on the spreaders ensures rapid and accurate positioning. At the same time, the broad rope spread prevents yawing around the longitudinal axis. The service life of the hoist ropes is enhanced by the low rope deflection sheaving used in this system – which has a beneficial effect on operating costs.



Benefits of Bracing Ropes in Intermodal Handling

- Antisway spreader operation due to bracing ropes and broad rope spread
- Increased service life of lifting ropes due to reduced rope deflection sheaving
- Rapid replacement of lifting ropes due to simple rope routing
- Simple adjustment of lifting ropes at the headblock
- Easy positioning by means of container trimming along the longitudinal axis

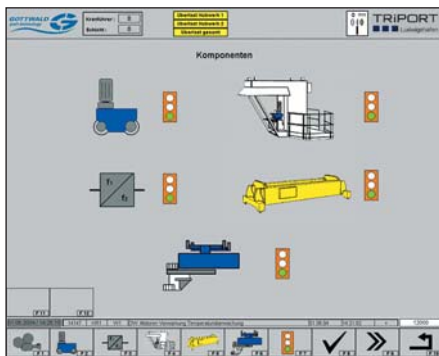
Gottwald's patented bracing-rope system ensures rapid, accurate positioning

Innovative WSG Control System

Economical Operation Coupled with Ease of Use

A key objective in the design of Gottwald products is to ensure ease of use and economical operation. For this reason, the WSG series of cranes is equipped with the same Visumatic® graphical user interface deployed successfully in Gottwald's Harbour Cranes.

The crane operator in the cab is able to use the monitor screen and controls to access all the crane functions. The clear, graphical display enables the crane operator to rely on simple,



intuitive actions for each function. Furthermore, the Visumatic® system provides a range of statistical evaluation options, allowing handling rates and operating hours to be monitored, to name just a few, and for troubleshooting.

To ensure economical operation, WSGs are equipped with an innovative control system. The crane operator simply enters the crane direction or target position, and the crane control system moves to that position, taking into account the load, the state of the stack and the starting position.

In day-to-day practice, this means that any defined position, like the slot number of a particular container or the transfer point to the lift platform can be approached at the push of a button.

Process Control Means Optimised Access Times

If the WSG is networked as part of a stackyard management system, the move commands received by the crane from the superordinate system are acknowledged by the push of a button and the crane moves to the container location automatically.

Where multiple WSGs are operating on a common craneway, the optional process control system supplied by Gottwald allocates the jobs so that the WSGs do not interfere with each other and access times are optimised.

A prerequisite for such an effective job assignment system is the exact knowledge of the position of the crane in all its axes. This is achieved in Gottwald WSGs using redundant absolute position detection systems.

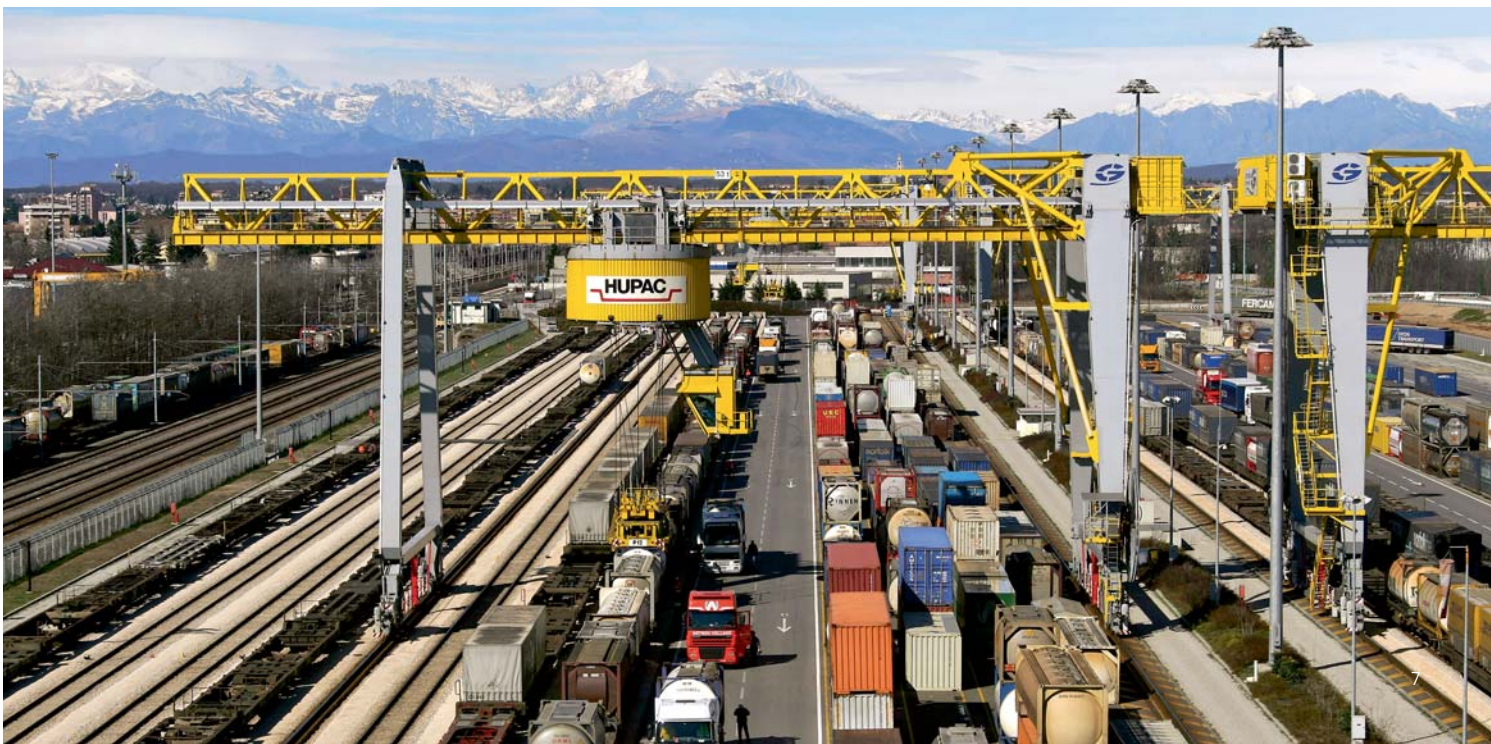
Safety First

Gottwald's crane control system not only increases efficiency, it is also pioneering new methods in crane safety. It is possible to define certain areas on the ground, where, for example, maintenance or building work is being carried out, as prohibited zones. This means that the crane operator can then either not enter these zones at all, or is allowed to, but at reduced speed.

Integrated Data Processing

All the data recorded by the crane control system can be stored and evaluated for production statistics or statistical fault analysis. Being able to record the operating hours for each subassembly facilitates targeted preventative maintenance. It is already possible for this state-of-the-art system to process and make available additional container details, such as photographs, weights or the tare weights.

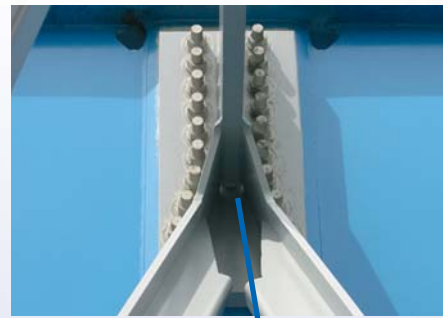
To maximise handling rates, the jobs are controlled by Gottwald's optional process control system



WSG Technology at a Glance

Innovative Solutions in Detail

The WSG is the synthesis of many years of experience in designing and building equipment for port logistics and the bundled innovative skills of Gottwald Port Technology. The result is that customers benefit not merely from excellent handling performance but also from low-maintenance constructions and a resulting reduction in running costs.



Flanged joints make it possible to install the crane in less than two weeks



Flanged Construction

The modular sections are connected by flange joints, which enables the WSG to be installed on-site in less than two weeks. By the same token, this design means that Gottwald's Wide Span Gantries can be extended by attaching additional segments and that the machine can be easily transported to a different location and quickly reinstalled. In many cases, this does not even require a full repeat of the electrical commissioning stage.

Three-in-One Braking System

Gottwald Port Technology applies its ground-breaking philosophy to the details, too. The WSG brake system consists of only two units. Apart from the wear-free electric service brake, there is a spring-loaded parking brake integrated into each travel gear bogie, whose function is to act as a parking and emergency brake and as a storm safety brake.

This new design of electronically monitored brake acts directly on the crane rails and automatically engages when the crane comes to a standstill. In this way, the WSG is prevented from drifting along the craneway even in storm conditions. The WSG brake concept offers many advantages:

- wear-free electronic service brake
- it is impossible for the storm brakes to be inadvertently applied or even forgotten.

The reliability of the WSG braking concept has been approved by the TÜV Süddeutschland (official technical inspectors)



The arrangement of the hoisting gear keeps rope deflection sheaving to a minimum, ensuring maximum rope service life

Centrally positioned electric container enables easy access to all electrical systems

Trolley

In designing the trolley, Gottwald placed considerable emphasis on the arrangement of the hoists. The result is that rope sheaving has been kept to a minimum. For maximum flexibility, our range of features includes:

- Rotating trolley with spreader
- Rotating trolley with or without antisway bracing ropes
- Non-rotating trolley either with or without rotating spreader.



Optional lift



The cab is comfortable and commands an excellent view



The Visumatic® – at-a-glance operator guidance system

Cab

All WSG crane functions are controlled from the cab, which is made of stainless steel. The high-up seating position and single-piece windscreen afford the crane operator an excellent view of the job site.

The ergonomic design of the cab facilitates efficient working and enhances operator comfort. A lift on the fixed legs is available as an option to provide easy ascent to the cab.

Visumatic®

The Visumatic® graphical user interface has proven its value in Gottwald's Harbour Cranes and provides intuitive control of all functions from the cab. In addition, the Visumatic® system provides these benefits:

- display of all crane functions on the monitor
- menu-guided selection of the operating modes
- statistical evaluations of handling rates, the current maintenance status of fault detection, for example.

Gantry Bridge

The gantry bridge of the Gottwald WSG is a lattice construction. These large-scale support constructions are over 6 metres high and have the following benefits:

- high bending rigidity with no need for overhead supporting structures
- small area exposed to the wind enables reliable and safe crane operation even under extreme wind conditions.

Gottwald WSGs Grow to Match the Task in Hand

Individual Solutions Using Standardised Components

All customers have their own highly specific requirements in terms of handling equipment, resulting from the nature of their business and the location of the terminal. Even today, this tends to mean that detailed requests for tender have to be composed for each individual machine. The result is often that one-off prototypes have to be built with long delivery times and complex commissioning stages.

Gottwald has responded to this by developing a range of standard modular components for the WSG series, which enables the design to be adapted rapidly and flexibly to meet customer needs.

WSG Standard Components

In developing these standardised components, Gottwald Port Technology has drawn on its decades of experience in the design and manufacture of Harbour Cranes. In the same way that these successful cargo-handling machines are based on a range of proven components and subassemblies, the Wide Span Gantries can also draw on these units.



Gottwald WSGs can be adapted to meet changed conditions

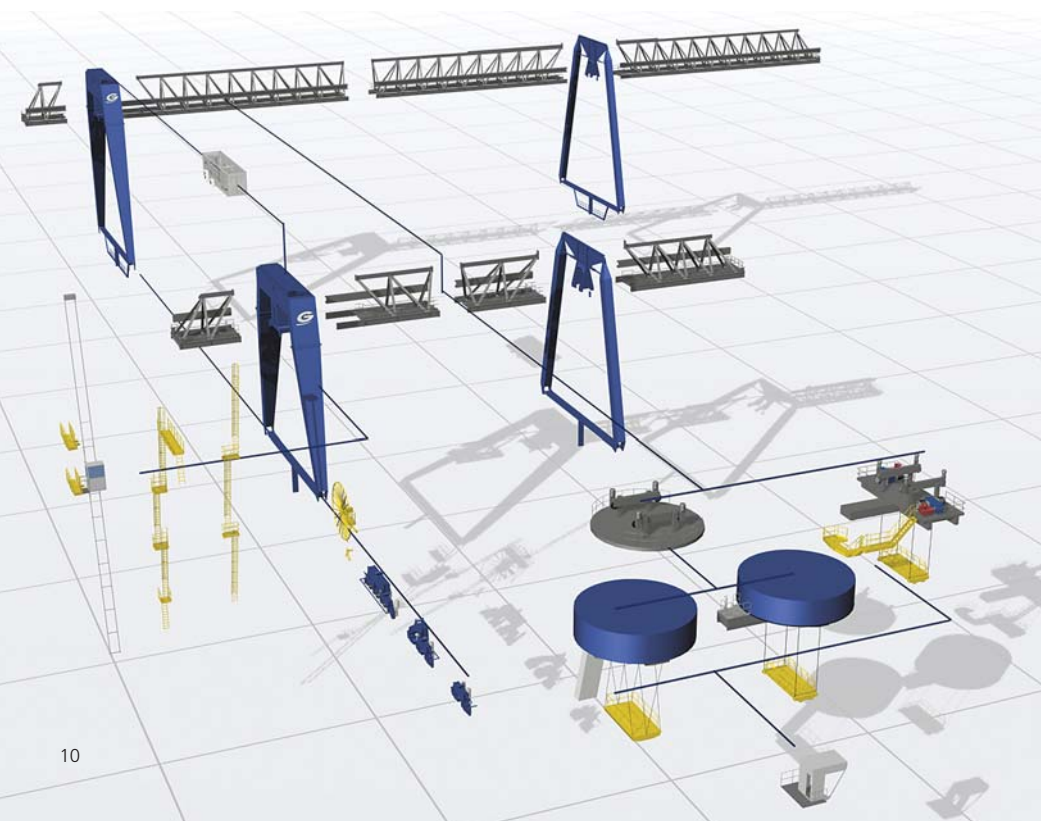
The Benefits of WSG Standard Components

- Reliability due to proven components
- Short delivery lead times due to the use of standardised subassemblies
- Very service-friendly since many subassemblies are known

Versatile and Flexible

This flexible concept makes it a simple matter to adapt a Gottwald Wide Span Gantry to a shift in requirements even after years of operation. If, for example, the capacity of a railhead is increased by adding more tracks, the WSG can be simply extended by insertion of a section in the lattice construction.

Individual solutions are created by using standardised WSG components



Reliable Service

Around the World, Around the Clock

Against a background of increasing pressure to reduce costs in cargo handling, and the simultaneous need for maximum availability, Gottwald Port Technology's after-sales service plays a crucial role.

Our reputation for providing customer support efficiently, flexibly and fast is based on our comprehensive range of services which is constantly being reviewed and expanded to meet market needs. These services cover the full range from individually designed special-purpose solutions to remote diagnostics via Teleservice.

Comprehensive Range of Services

Gottwald Port Technology's service portfolio includes:

- 24-hour service stand-by
- technical support
- spare parts from centralised warehouses and worldwide depots
- spare parts packages for first-time supply
- service contracts
- assembly and commissioning
- upgrading and retrofitting
- crane inspection and overhaul
- crane transport
- customer training and documentation.

Teleservice

Besides the conventional services offered by Gottwald Port Technology, Teleservice is of particular importance for Wide Span Gantries. Teleservice is a remote diagnostics system for transmitting machine and process data from the crane to the customer's site office or back to Gottwald's Service Centre.

Since Teleservice provides the service technician with the option of direct remote control of the crane, defects can be remedied rapidly on-line. In addition, the system provides details of the maintenance status and statistical data.

Gottwald customers who use Teleservice benefit from:

- increased crane availability
- targeted, rapid fault detection and remedy
- reduced on-site time for fitters
- direct software support
- preventative maintenance.

In this way, Gottwald Port Technology guarantees the high degree of service reliability required for maintaining problem-free, economical Wide Span Gantry operation.



Professional training of crane personnel at Gottwald Port Technology

Teleservice ensures maximum availability of Gottwald's Wide Span Gantries



The WSG assembly concept minimises interference in day-to-day operation and the flow of terminal traffic



service@gottwald.com



Gottwald Port Technology GmbH • Postfach 18 03 43 • 40570 Düsseldorf, Germany
Phone: +49 211 7102-0 • Fax: +49 211 7102-3651 • info@gottwald.com • www.gottwald.com

Gottwald Port Technology GmbH – A subsidiary of Demag Cranes AG

