World's biggest woodchip transfer bunker

(photo: ©BTW Plant Solutions, a division of BT-Wolfgang Binder)

BTW Plant Solutions delivers mobile bunker to LIEBHERR-MCCtec.

BTW Plant Solutions, a division of Austrian company BT-Wolfgang Binder, has successfully completed a project in Sweden that has now gone into operation. An impressive bunker system from BT-Wolfgang Binder serves a state-of-the-art biomass heat and power plant in Värtan, Stockholm, where it is used to unload woodchips from ships and transfer them to the power plant.

The power plant is owned and run by Fortum Varme, a joint

venture between the city of Stockholm and Sweden's largest power generating company Fortum, which supplies district heating and cooling to industrial and residential customers.

Fortum has invested around €500 million in the new biomass CHP (combined heat and power) plant, which just went into service at the beginning of 2016. Construction of the plant began in 2013. It is one of the largest of its type in the world and will provide heating and electricity for around 190,000 households per year for 50 years.

This new plant represents a total modernization of the district heating system in Stockholm and because it will use more fuel efficiently, it is estimated to reduce harmful emissions by 126,000 tonnes per year.

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The woodchip transfer bunker was designed, delivered and commissioned by BTW Plant Solutions, a division of Austrian company BT-Wolfgang Binder GmbH. Its job is to receive bulk solids — in this case woodchips — which are unloaded from ships and transported along a jetty to the power plant. At the inland end of the jetty it serves two belt conveyors, which lead to the power plant's storage bins. The bunker runs on rails and is coupled to a revolving gantry crane by connecting bars. The crane loads the material from ships into the bunker and also provides the motive force for moving the bunker along the rails when it is full and when it is empty.

STATISTICS

Bulk solids	woodchips, biomass
Bulk density	0.4t/m³
Particle sizes	L+B+H = max. 300mm
Crane bucket volume	50m³
Transport rate	3,000m³/h or 1,200tph
Rail gauge	16m
Transport dimensions	L x B x H = 17m x 20m x 20m
Weight (approx.)	400t

The bunker is designed for use in a maritime environment in temperatures of –30°C to +45°C with 97% humidity. BTW Plant Solutions delivered a fully functional, completely assembled bunker with all the necessary equipment. It was assembled in the yard of its immediate customer Liebherr MCCTec in Rostock Port in Germany.

(photo: ©BTW Plant Solutions, a division of BT-Wolfgang Binder)

From there, thanks to the direct sea connection, the 400-tonne bunker assembly was delivered by ship to its destination in Stockholm.

The rail-mounted bunker is coupled to the Liebherr gantry crane Type LPS420 and is used for transferring material to the power plant but not for storage. The system as delivered involved not only the steel construction and the outer covering of trapezoidal sheeting, but also a volumetrically controlled discharge system, which deposits the woodchips on the conveyor belts below the bunker. This system is variable and allows material to be fed to only one of the conveyor. The material is often damp in winter; this made it necessary to install a heating system for the sides of the bunker and the specially designed intake grating, to prevent woodchips freezing to the bunker.

At the other extreme, woodchips and sawdust may also be delivered in a very dry state, so that local dust extraction systems were needed at both the intake and discharge sides of the bunker. The bunker construction also has spaces for hydropress tanks, electrical equipment and controls.

"This bunker system involved a large number of engineering challenges such as the large transfer volume, the redundancy of the discharge system, difficult bulk material (e.g. particle sizes, moisture content), ambient temperatures, dust extraction, noise protection, fire safety and the dimensions of the assembly to be delivered. BTW Plant Solutions rose to all these challenges and delivered the product successfully, reports Johann Buchgraber, Head of Sales for Conveyor Technology BTW Plant Solutions, a division of BT-Wolfgang Binder GmbH from Austria.