GETTING A HANDLE ON BIOMASS

PEINER radio-controlled single-rope grab, type EGF 60, operating with a container crane in Denmark.

Jürgen Bialek, PEINER SMAG Lifting Technologies, Germany, discusses the company's latest developments in cranes and grabs to accommodate the growing biomass industry.

Biomass has quickly become a global business due to a global interest in developing cleaner energy. PEINER SMAG Lifting Technologies GmbH is already well prepared for this greater demand in renewable energy sources. The company offers individual solutions for the handling of biomass by providing the right grab for almost all lifting devices. All of the company's grabs have been designed with sustainable and ecological construction. The company has recently implemented an integrated management system (IMS) that combines the

PEINER four-rope orange peel grab, type VMG, handling wood chips in Indonesia.

PEINER motor dual scoop grab, type MZGL, handling wood chips in Germany.

individual areas of quality, environment, protection of employment and energy into one grab unit. This new system was successfully certified by TÜV Süd in accordance with ISO 9001, 14001, 50001 and OHAS 18001.

Advanced material handling equipment

The technical and economical growth potential of renewable energy for power generation, heat and fuels is substantial, with biomass covering over 10% of the world's energy demand. The transhipment of biomass at ports and terminals, waste-to-energy plants, timber mills and co-generation plants is continually increasing. Apart from agricultural goods (such as corn, sugar cane, canola and other food crops), biomass products (such as timber, bark, saw mill waste, wood chips and pellets) are also handled. In addition, organic waste from household rubbish and residual products from the food industry also play an important role in the handling of biomass.

With its wide range of applications, PEINER grabs can handle all kinds of biomass materials, with certain grabs tailored towards the special needs and requirements of particular industries. In the timber handling industries, the use of hydraulic and electro-hydraulic timber grabs are primarily commonplace, with operators benefitting from their high-load capacity, high closing force and special shaped tongs for the handling of timber logs. These key features enable the grab to handle logs in any variety, whether round timber, bundled and even single logs safely and efficiently.

When handling bulk materials, such as wood chips and wood pellets, crop or organic waste, motor grabs or four-rope grabs are generally used. Due to their technical features the company's motor grabs offer many advantages, especially for their use in incinerator plants. The PEINER MMG/MMGL series of motor "orange peel" grabs are already successfully established within the incineration market. These PEINER grabs are operated in both reversing operation and continuous running operation according to DIN EN 60034. They operate in fully-automatic, semi-automatic and multi-shift mode. Its specially designed construction allows for fast operation and is highly energy efficient. The optimal installation height, low centre of gravity and robust design ensures the flexible use of the MMG/MMGL series. Thanks to individually driven shell segments, the motor "orange peel" grab adapts to suit the materials being handled. The shell segment design and the number of shell segments on the grab can easily be adapted to meet customer requirements. Hydraulic pipes,

wiring and connections as well as the cylinder barrel and piston rod are fully protected from external elements. The cylinders are fitted with oil damping at the end of travel to reduce noise and increase durability. Inside and outside shell plates are made of highly wear-resistant special steel, HARDOX. The self-regulating pump, with its integrated power regulator, ensures improved energy efficiency, protects the motor and enables optimal closing forces. The grabs can be supplemented with further optional accessories: oil level watch and switch, oil tank thermometer and heater, inclination sensor in the control cabinet, central lubrication, as well as thermal protection for the engine.

Depending on the field of application, PEINER SMAG offer the option of mechanically operated rope grabs, which are available in clamshell or orange peel grab design. The balance ratio between the dead weight and grab volume, or crane capacity respectively, provides a good level of penetration into the bulk material supporting higher throughput rates.

PEINER motor orange peel grab, type MMGL-4, handling rubbish at a waste-to-energy plant.

Radio-controlled single rope grabs

Equipped with PEINER radio-controlled single-rope grabs, any deck or container crane is operationally ready for biomass handling at short notice without the need for any additional accessories. This PEINER single-rope grab has already proved to be a reliable solution onboard bulk carriers. A handling volume of over 30 m^3 allows the use of the existing crane lifting capacities even during grab operation. The radio control unit initiates the grab opening. This process can be interrupted several times in the initial stage, for example for loading small hoppers or trucks without any loss of material. As an alternative, the grab can also easily be opened manually by means of a pull rope.

Delivered with a handheld control panel, operators can easily control the PEINER radio-controlled single-rope grab by using this handy device, ensuring trouble-free wireless radio communication up to 500 m. The high-power accumulators of the radio control allow for continuous duty up to 24 hours. They can be changed easily and quickly without the need for any tools.

New single-rope clamshell grab

In 2015, PEINER SMAG was tasked with the construction of a grab that can be operated with an existing container crane for the handling of bulk cargo at a large port in Europe.

As most of the proven grabs could not be used to fulfil the requirement of operating with an existing container crane for handling bulk material, PEINER SMAG decided to develop an efficient solution tailored to this customer's needs. It was a challenging technical task: since the crane is not equipped with the necessary hoisting gear/winches, mechanical two-rope and four-rope grabs were suitable for operation with this type of crane. Hydraulic and electro-hydraulic motor grabs require a wide range of accessories to be installed on the crane and would go beyond the planned budget, so these grabs could not be taken into account. Another alternative is the use of diesel grabs, however they are known to have a negative impact on the industrial safety and they also provide limited operational flexibility. For the required handling capacity of more than 30 m^3, the grab must have a powerful engine as well as an exhaust system to meet the permissible emission levels. After all possibilities had been reviewed, PEINER SMAG decided for the only workable solution: the PEINER radio controlled single-rope grab (EGF).

The EGF grabs have been successful onboard bulk carriers for the past 15 years, but the grabs were primarily used for handling volumes from 12 – 15 m^3. The goal was to construct an EGF with a volume of over 30 m^3 in order to use existing crane lifting capacities even during grab operation. These specific grabs (EGF 60) for the handling of biomass and other bulk materials are the largest radio-controlled single-rope grabs ever built by PEINER SMAG. In addition to a new design engineering of the basic unit with special cylinders, the

PEINER motor dual scoop grab, type MTGL-3, working in an ash bunker.

grabs offer a sensor attachment transmitting actual operational states to the crane driver by wireless communication. This feature helps crane operators work faster and more effectively. The grabs are provided with a centralised shift of lubricating points and are therefore easy to maintain.

An intelligent climbing assistance system ensures the highest standards of job safety for the maintenance staff on the job site. The grabs are assembled with a universal suspension that enables the operation both lengthways and crosswise. PEINER's scope of supply also includes an adapter unit in the form of special load traverses to connect the grab with the crane headblock. The traverses have a range of supplementary features, including a proximity sensor, light and camera systems, control cabinets and electrical plugs. This is the first time that a PEINER radio controlled single-rope grab of such a large size has been put into operation at a container crane.

Ash handling grabs

Combustion residues from an incinerator plant are temporarily stored in the so-called ash bunker and are then disposed of. SMAG has developed the PEINER Motor Dual Scoop Grabs, MTGL-3 product series, for work in the ash bunker. This product series is characterised by a large opening width and a strong closing force thanks to its four cylinders. The inclined position of the cylinder keeps its height to a minimum. As the grabs are also used below the ash bunker, pipes, wires and connections are fitted with all-round protection that prevents dirt from entering the hydraulics. The PEINER ash grabs are equipped with exchangeable teeth that tear the partially hardened and crusted surface apart and guarantee optimal filling.

Conclusion

PEINER SMAG discerns a positive trend in the handling of biomass and continues to expand its efforts in providing high-quality, reliable grabs in this market, particularly in the waste incineration industry. An existing framework agreement with a major client for the delivery of motor grabs to operate in the incineration plant has been highly successful with incoming waste and the byproduct of ashes handled by the MMGL/MMTGL series PEINER motor "orange peel" grabs. **DB**

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