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Austrian know-how ensures stability during heavy winds

Heavy plates for offshore wind towers have to withstand enormous forces, with manufacturers of wind tower steel foundations relying on the latest milling technology to maximise robustness, durability and performance. PES takes a look at the latest processes and solutions available.



offshore, and line pipe and boiler construction sectors, among many others.

Highly versatile plate production

The LINSINGER plate edge milling machine at Dillinger is the largest of its type in the world. It mills plates up to a thickness of 180mm, from 4m to 30m in length and from 1.35m up to 5m in width, with a weight up to 45 tons. For an 80mm thick plate the four machines can mill 384m of edge per hour and each has 2 x 142 kW milling power. The single machine weighs up to 400 tons and is about 110m long. For easier handling, it also automatically removes the chips during production.

In addition to rectangular plates, the plate edge milling machines can mill the edge profiles on trapezoidal and tapered plates as well. These are required for the tapered geometry of wind tower structures. Plate edges for plate thickness reductions, or taper edges, can also be milled. The plates are pulled through the two cutting stations on each side of the machine. The cutter heads are equipped with special carbide tips, which prevent any thermal impact. The machine is designed for short processing times and efficient plate handling from start to finish.

Four-sided milling

For the next step of the manufacturing process of a wind tower, LINSINGER's latest generation of PFM PT plate edge milling machines enable edge processing on all four sides: two longitudinal and two transverse sides, of a plate in one clamping. Proven technology ensures a high feed rate at the lowest possible tool costs.

The machine can be entirely customised and sheets of any size, with a weight of up to 200 tons processed. The gantry milling concept and magnetic clamping units provide maximum flexibility and complex sheet shapes, such as trapezoidal and curved sheets, e.g. for the shipbuilding and wind tower industries, can also be machined.

This state-of-the-art machine is able to mill tapers too. Special clamping tables are available for non-magnetic and complex materials, such as stainless steel, high-alloy steels, duplex and super-duplex alloys. Optional minimum quantity lubricant spray nozzles ensure economical machining of these materials as well.

Achieving success with economy and maximum precision

Depending on the required productivity, the four edges can be machined with one or two milling units. The two long sides are machined simultaneously, which decisively increases the throughput and thus the cost-effectiveness of the system, with a maximum milling speed of 10m per minute.

The sheet is quickly and easily aligned by means of a coordinate matrix and fixed in

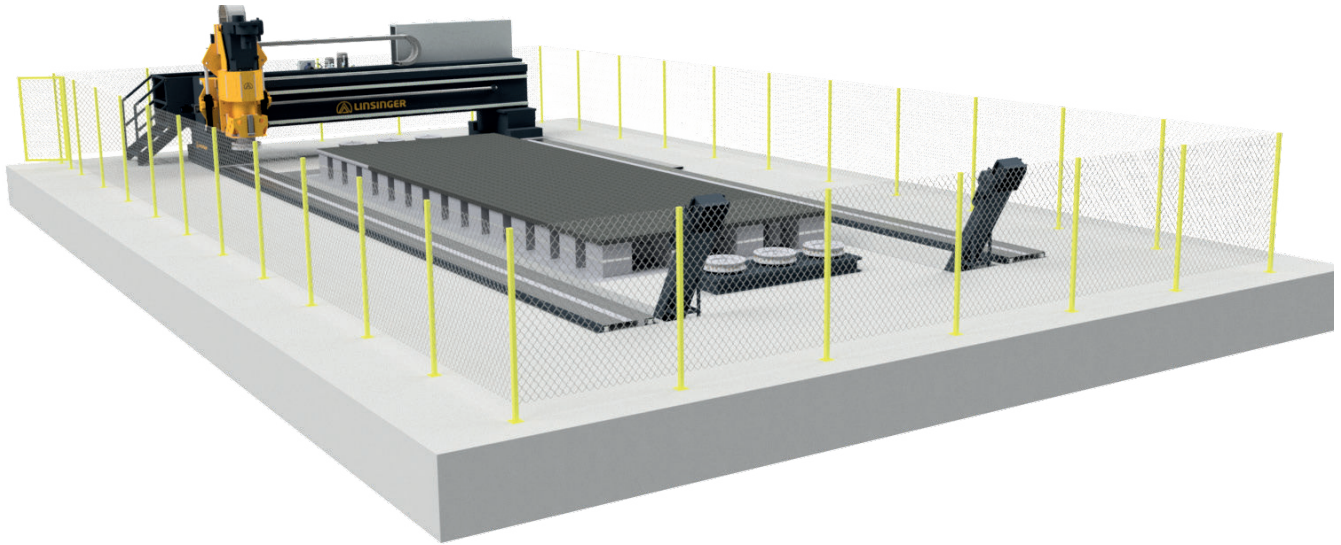
The use of wind power off the coasts in the form of offshore wind farms is booming. Despite Covid-19 disruptions, 2020 was the second highest year for offshore wind installations. Worldwide 6.1 GW of offshore wind was installed. This trend will certainly continue, with forecasts for the next decade predicting 235 GW of new offshore wind installations under the current policies.

Even more than on land, wind towers at sea place the highest demands on materials and technology. This applies above all to the steel and heavy plates used. The customers of the Austrian manufacturer LINSINGER are among the most important suppliers of edge-milled plates for wind turbine manufacturers, relying on sheet metal plate milling machines to deliver quality results.

A perfect match

One longstanding client is Dillinger, the market leader in manufacture of high-grade heavy plate steel for the offshore wind industry. The Dillinger group acquired the first PFM machine in 2003. Proving their foresight for the wind industry. To keep up with world demand and stay number one in this field, Dillinger recently acquired another plate edge milling machine, bringing it to a total of four machines for the group, three in Germany and one in France.

The Dillinger Group employs around 6,200 people. Its high-tech plate is used to realise extraordinary and technically advanced projects all over the globe in the offshore wind power sectors, as well as in steel construction, mechanical engineering,



Falcon - 4-side plate edge milling machine

place by pre-positioned magnets. High-precision drive technology, a CNC control system and the machine program are further factors that guarantee the highest precision on the workpiece and the lowest plate tolerances.

All LINSINGER plate milling machines also allow the use of special milling heads, which can be designed in sandwich construction and enable maximum flexibility in the weld profile shapes. Options such as automatic tool changing devices, automatic loading and unloading systems further round out the level of automation. This makes production economical even for small batch sizes and even for a single piece if necessary.

Tool and machine from a single source

20 years ago, the manufacturer of special machines and equipment for the steel industry created an in-house tool technology centre.

In today's production industry, machine costs are calculated in life cycles. The company found the running costs for tools, calculated over the life of the machine amount to a multiple of the investment price of the machine.

The machine know-how and specially tailored tools provide the customer with a reliable view of the tool costs already in the project planning. When commissioned in-house, this package is further refined and precisely tailored to customer requirements. This eliminates the need for lengthy tests after commissioning and shorter production runs, all within the agreed output.

Should there be a need for further optimisation at a later point, there is no

need for lengthy third-party discussions. LINSINGER, working as sole supplier, is solution-oriented and offers comprehensive after-sales support via our service technicians and tool specialists worldwide.

A trendsetter with humble beginnings

In its over 80-year-old history, the company has grown from a small family business to a global player, with over 500 employees at its company site in Austria.

But let's not forget its humble beginnings in 1938. Dr. Linsinger started his business with small milling machines, which were made by a handful of employees. The strategy to focus on niche products proved right. Throughout its company history new machines and techniques have been developed, such as a patent on high-speed milling or the invention of mobile rail milling. At the beginning of this year the largest circular saw in the world was completed and in 2020 the world's first hydrogen powered



Milling head



rail milling train was launched.

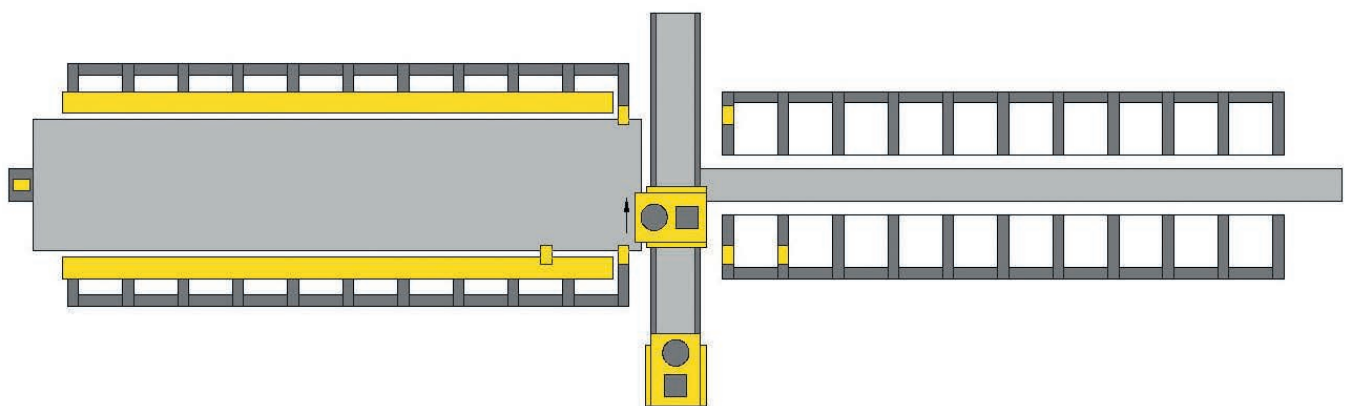
The secret to success lies not only in inventions and new products, but also in good customer service. The opening of a branch in China in 2021 was a necessary step

to be closer to customers in Asia, solely to offer the best and fastest service possible.

With the plate milling machines from upper Austria, plate suppliers are perfectly equipped for the strong upswing in the

offshore wind farm market, which will continue in the coming years. In addition, the wide PFM type range also offers the perfect solution for any other customer requirement.

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