APPLICATION EXAMPLES

Superior as towers: adhesion of the steel towers to the foundation in the mega wind farm Piiparinmäki secured by liquid lining plate MM1018

The 155 meter high steel towers to which the turbines are attached are subjected to enormous forces. This poses technical challenges for the larger dimensioned flange connections with which the towers of the wind turbines are connected to their foundations with bolts.

In Finland, the country's largest wind farm is currently being built in the municipalities of Pyhäntä and Kajaani. The project includes a total of 41 powerful turbines with a total output of 211 MW. In order to guarantee the frictional connection of the 155 m high steel towers to the foundation permanently and with high precision, the gap compensation at the imposing ring flange connections in the foundation was carried out with the liquid lining plate MM1018P from DIAMANT Polymer GmbH. MM1018P is a highly filled, pasty metal polymer for full-surface and non-positive compensation or filling of inaccuracies and bumps between metal elements, which is increasingly being used worldwide in the construction of impressive wind turbines.

Efficient securing of the basis of regenerative energy generation

Wind turbines play an important role in the realizing the energy transition. The foundation of a wind turbine represents the transition from the tower to the ground. It secures a wind turbine from sinking or falling over. It also absorbs the lateral forces acting on the tower. Just like any other large building or structure, a stable foundation is essential. It serves as an anchor and gives the turbine a solid and stable base.

The ever-growing steel towers to which the turbines are attached are subjected to enormous forces. This poses technical challenges for the larger dimensioned flange connections with which the towers of the wind turbines are connected to their foundations with bolts. To ensure that these bolts do not come loose – a problem that is often associated with considerable repair costs and downtime – the connecting flanges must be flat and tight to the millimeter so that no excessive tension can build up. Flanges and their components can only meet the high requirements of a long service life of wind turbines if they are exactly flat.

APPLICATION EXAMPLES

The modular towers are the largest and heaviest part of wind turbines. A tower can weigh hundreds of tons and account for up to 25% of the cost of the entire facility.

Flange mismatch can affect bolts

When it comes to safety, stability and efficiency, the liquid lining plate MM1018 shows its strengths. When welding the flanges into the foundation, distortions and gaps often occur. Flange mismatch and fatigue can compromise bolting and hence turbine tower stability, necessitating repairs and resulting in prolonged plant downtime that is costly to the operator. Maintenance over the lifetime of a wind turbine can account for up to a quarter of all costs.

“We are proud to support the development of the wind energy industry. By securing the tolerances, we help to ensure the integrity of these large structures and thus the production of green electricity for many years to come,“ says Carsten Kunde, Managing Director of DIAMANT Polymer GmbH, with satisfaction.

High-precision tolerance compensation in no time at all

Until now, the surfaces of the flanges in the foundations of the steel towers of the wind turbines have often been manually corrected in a time-consuming process in order to achieve an approximately even surface. With MM1018P, unevenness, gaps and exceeding tolerances on connections of steel components can be compensated for quickly, easily and efficiently. The liquid lining sheet creates a non-positive and positive connection between steel components in a short time.

The highly filled metal polymer M1018 enables the high-precision, full-surface adhesion of the steel towers to the foundation. After curing, the excess material is properly removed (right picture).

APPLICATION EXAMPLES

Implementation of the gap compensation by experienced DIAMANT specialists

In order to achieve the best possible frictional connection between the foundation and the turbine tower in the Finnish mega wind farm Piiparinmäki, the Finnish wind farm operator took advantage of the service offered by DIAMANT Polymer GmbH to have the gap compensation on the imposing annular flange connections of the tower foundations carried out by a team of experienced specialists.

For this purpose, the foundations were first carefully cleaned. In addition, a durable, resistant DIAMANT screw protection was used to prevent the thread from sticking with MM1018 later. The liquid lining sheet MM1018P was then precisely applied in a paste-like form. The highly filled metal polymer enables gaps, inaccuracies and unevenness between metal elements to be compensated for with high precision, across the entire surface and with a non-positive fit. Finally, the excess material was duly removed.

MM1018P is characterized by a very high compressive strength, fast curing and permanent resistance to corrosion and weathering. The big advantage of MM1018 compared to conventional steel lining plates is that MM1018 always fits in every situation and does not need to be machined or adjusted. This saves time and money during installation and enables smooth construction acceptance.