

F149-14 Andresen Towers – Wind Turbine Towers

The Next Generation of Wind Turbine Towers



With the ever increasing demand for wind power, alongside the challenge of producing taller and taller wind turbines, Andresen Towers has developed a new type of wind turbine tower.

As with all steel structures which are located outside, corrosion is an issue which needs to be addressed. During the design stage of the tower systems, Andresen Towers reviewed a number of protective coatings and finally decided upon a coating of thermal sprayed zinc, applied with Metallisation ARC528, and finished with a paint top coating. At the bolted flange areas of each tower panel the zinc coating is left unpainted. As well as offering excellent corrosion protection, the texture of the zinc spray aids in the strength of the bolted joint by increasing friction.

For land based towers, the ends and the flanges are all sprayed, including the internal and external flange areas. During the metal spraying process, the spray rate is varied, as some areas are specified as requiring a thicker coating than others. For on-shore towers, that will be located within 25km of the coast, the whole outside of the tower is metal sprayed.



With huge demand for these towers and the large surface areas to be protected, it was immediately apparent that conventional manual thermal spray systems would not efficiently cope. It was also clear that standard automated systems would struggle to meet this demand. However, Metallisation's proven ARC528E-ACD/S1500 systems, operating at up to 1500A offered the ideal solution.

Each tower section is made up of fourteen individual panels, which are then bolted together on site. The advantage is that the smaller, lighter wall sections can be easily transported into hard to access areas, such as forests, where a tall tower is required but access for transport is often limited.

Andresen Towers, a privately owned company based in Denmark, specialises in the development and production of bolted steel shell towers and is a customer of Metallisation distributor, Sonnimax.

Andresen Towers has purchased three Metallisation ARC528E/S1500 systems, which have been used to metal spray the wind turbine towers, in order to protect them from corrosion. The design and coating specification of the wind turbine towers is stringent and volumes are high, which is why the whole process has been fully automated for maximum efficiency.

Prior to the metal spraying process, the panels, manufactured at another Andresen Towers facility, are automatically prepared. The preparation process includes, inspection of the panels and degreasing and shot blasting of the complete panel sections. The metal sprayed areas are also grit blasted to an SA3 specification, in a robotic blasting cell. Quality control checks are implemented at various stages of the preparation, as would be expected in a high class facility. The prepared panels are then automatically transferred, by conveyor, to the metal spray booth.



The fully automated metal spray facility is an acoustic booth containing two robots, one positioned above and one below each panel. One of the pistols has been modified from its standard configuration to enable better access. This ensures a high quality coating is applied to the underside of each panel. An electronically synchronised push/pull system is used under

the panel, due to the longer reach demands of the robot. The 500kg zinc drums, which are located outside the booth, are supplied with leading / trailing edges exposed on the wire. This allows the operators to join the wire and maintain continuous production even when the drums run out and need to be changed.



Metallisation distributor, Sonnimax, was heavily involved in the development of the complex spray booth. Sonnimax engineered, supplied and coordinated the complete installation of the blast equipment and extraction system. This included the installation of a 72 cartridge dry filtration system, which is designed to safely and efficiently handle the dust extraction produced by the spray process. Metallisation's ARC528E systems form part of the coating process and are also located within the spray booth.

Once the panels have been metal sprayed they are automatically checked for the zinc coating thickness, masked where appropriate and finally painted. Each of the panel sections are then fitted out with ladders, platforms and fixing points, before being stacked and wrapped for transportation to the erection site.

For more information on the ARC528E equipment and consumables, please contact Stuart Milton, Sales Director, Metallisation on +44 (0) 1384 252 464 or visit www.metallisation.com, where a video of this process can be viewed.