

Design of a foundation structure for offshore wind energy plants

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Concept

Salzgitter Mannesmann Forschung has developed an alternative type of foundation structure for offshore wind energy plants.

Instead of the braces used in other jacket structures, the new design relies on segmented mounting plates for stiffening the structure (**Fig. 1**). Additional axial stability is provided by pins at the girth welds (in the area of the mounting plates). The newly developed foundation structure can be made entirely of semi-finished products made by Salzgitter AG (tubes, plate and beams).

The decisive edge of this design is that it allows **standardized industrial production** (**Table 1**).

If flexible clamping devices are used, it is also possible to build conical structures (**Fig. 2**), whose static properties are significantly superior to tubes arranged in parallel. Subsequently, the different variants and lengths of modular segments are joined together. That way, despite standardized industrial production, better account can be taken of the environmental conditions prevailing in a given windpark. A comparison with existing jacket structures shows the pre-production structure of the newly developed design, which is made up of only a few different semi-finished products.



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Fig. 2: Segmented mounting plates



Table 1: Series yet flexible production steps









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Advantages of the newly developed structure over conventional jacket structures

- Standardized semi-finished products (uniform length / dimensions)
- Very few different semi-finished products (only four different parts: tubes, plate segments, connecting pins and stiffening beams)
- 100% Salzgitter material
- Automatic welding of joints
- No contour cuts (only plain ends prepared for welding)
- Standardized mill coating of tubes possible using a state-of-the-art process
- Variable total diameter (thanks to flexible "revolver" and variably sloping tubes)
- A radical departure from production methods used until now: series production, i.e. short production times
- High reproducibility / close tolerances
- In-house production or licensing