

TATA STEEL



Case Study

Ib Andresen Industri

Project Name: Tata Steel's Ympress® enables Ib Andresen Industri to build 150 metre high wind turbine towers

Project: wind turbine towers

Client: Ib Andresen Industri

Product: Ympress® S355MC and S460MC



For the towers, Tata Steel's Ympress® S355MC and S460MC steel grades are used.

Ib Andresen Industri

Danish Steel Service Centre, Ib Andresen Industri, has developed a new design for wind turbine towers. The unique design concept is based on steel strip sections that can be bolted together at the site where the tower is to be erected. Andresen has signed a distribution agreement for these towers with Siemens Wind Power, who will have exclusive sale rights.

Background

The height of a wind turbine tower has a proportional relationship to its cost effectiveness. As altitude increases, wind power gets stronger and more consistent. Not only do taller towers allow energy providers to make better use of more stable wind, placing turbines in remote and forested areas releases land for multiple use.

For conventionally-designed towers, made from heavy plate welded together in large segments, it is very difficult and expensive to reach these remote destinations. Andresen's design and Tata Steel's Ympress® provides an effective design solution.

Creating taller towers comes with an inherent demand for high strength and stability. To meet this demand, Danish Ib Andresen Industri developed a revolutionary new design for the production and erection of wind turbine towers. Tata Steel's high strength Ympress® S355MC and S460MC were chosen by Andresen as the ideal materials for this task. Tata Steel produces these grades in heavy gauges at wide dimensions – well over two metres wide. An added advantage for Andresen is Tata Steel's short supply chain.

Working in partnership towards a sustainable future

Ib Andresen was founded in 1967 as a Steel Service Centre, and since then the company has added sheet and plate working, roll forming and industrial coatings to its product range. With companies in Denmark, Sweden, Hungary and Thailand, Andresen processes more than 500 KT of steel each year.

Ib Andresen and Tata Steel have worked closely together since the sixties, and vast quantities of steel have been supplied for application in automotive, construction and domestic appliances. The wind turbine tower project is one of the latest examples of this longstanding, cooperative partnership.

The right product for the job

Andresen's design for this new tower incorporated a wider base diameter, to support the height of the tower. To ensure structural soundness, the materials need to be of exceptionally high quality and strength, with the narrowest tolerances possible. With this in mind, the Ympress® family was chosen. With its strength and predictable mechanical properties, it is ideal for demanding processing. It ensures precise construction of the towers on site.


Reliable quality and consistency

Tata Steel's Ympress® offers good coil-on-coil consistency in terms of steel chemistry, mechanical properties and gauge tolerances, meeting all the performance requirements for these much higher towers. Combined with the excellent surface quality the consistency of Ympress® helps to reduce tool wear and limits rework steps during manufacturing, helping to improve cost-effectiveness.

Ympress® is supplied to Andresen with the aim of combining tight gauge tolerances with low crown. Gauge is well controlled over the length and width of the steel strip, to avoid issues when bolting together the segments at the towers' final destination.

Outstanding formability

The processing capabilities further benefit from the very low sulphur content in Ympress® steels, delivering outstanding formability and guaranteed minimum elongation levels. This formability facilitates tight bending, and stretch flanging, a form of bending operation that results in a 90-degree bending of the metal. The tight gauge tolerances of these Ympress® grades ensure reduced springback variability.



The Ympress capabilities enable Ib Andresen to design taller wind turbine towers.

“The new tower design eliminates the need for the very expensive transport required for traditionally welded towers, and makes it possible to place these towers almost anywhere!”

Tom Andresen, CEO of Danish Steel Service Centre Ib Andresen Industri

Ympress® enables on site construction

Due to its higher strength the sheets can be made thinner, enabling easier handling. Traditionally-designed wind turbine towers are delivered in large, ready-welded structures, making transportation difficult and expensive.

In this unique design by Andresen, segments of steel strip are bolted together on site. The sheets can be transported on standard trucks or containers, increasing accessibility to more remote destinations. The properties of Ympress® and tight processing parameters ensure the sheets fit together perfectly during 'on site' construction, enabling reliable assembly every time.

The Ympress® S355MC and Ympress® S460MC high-strength, low-alloy steels (HSLA) are supplied to Andresen in coils of over two metres in width, via a very short supply chain to the Andresen plants in Denmark.

Summary

Andresen has developed a new method to produce and erect very tall wind turbine towers. Tata Steel's ability to produce high quality, wider-than-average grades, played an important role in the introduction of these unique shell structures for Andresen's high wind turbine towers.



The new taller tower is uniquely bolted together on site.

Features, advantages and benefits of Ympress® steel

1. The Ympress® range comprises a series of grades of HSLA steels
2. The homogenous nature of the steel makes for consistent results in processing and finish quality
3. Steel can be provided up to a width of 2070 mm
4. Ympress® has supreme gauge tolerances
5. Ympress® has a low crown, improving ease of processing
6. Ympress® has excellent surface quality
7. Ympress® is ideal for high-strength but light weight engineering

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General Industry - Strip
Wenckebachstraat 1, Location 7H.04, 1951 JZ Velsen-Noord
The Netherlands
T: +31 (0)251 496126
F: +31 (0)251 470224
E: strip.enquiries@tatasteel.com
NLISLTCS:750/ENG:11/2013

www.tatasteeleurope.com

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