

Design of 500 + 125t x 23m Span Ladle Crane for TSK

By Tata Steel | Category: Design Honour

Tata Steel received an order to supply a 500t Ladle Crane with a 35m lift for TSK. Before this, the maximum capacity for a crane designed by Tata Steel was 280t with a 26.5m lift. The total weight of the 280t crane was 498t, with a maximum wheel load of 70t. If Tata Steel follows the same design, then the estimated weight would be around 880t, with a maximum wheel load of 120t. Here, the challenge was to reduce the weight and maximum wheel load of the crane, which is required to reduce overall cost of the project (cost of crane, building and power consumption).

The Innovation

Tata Steel had to design the crane as per the customer's specification without compromising its safety, quality and reliability with lowest weight and cost. To fulfil these norms, the following aspects had to be taken care of:

- Selection of optimum sized rope
- Use of high strength material in hoist drum, wheels, shaft and other components
- Optimised layout of trolley and crane
- Increasing the size of rail
- Increasing the number of LT wheels
- Use of barrel coupling
- Use of an imported gear box for the main hoist
- Use of semi-modular drive in the main trolley
- Use of high strength plate material in the Girder and End Tie
- Use of weigh beam type load cell

Impact of the Innovation

cost saved

₹30 mn

Overcoming Challenges

Reduction of design cycle time was a challenge that was overcome by adopting a modular concept in the design and using standard components.

