

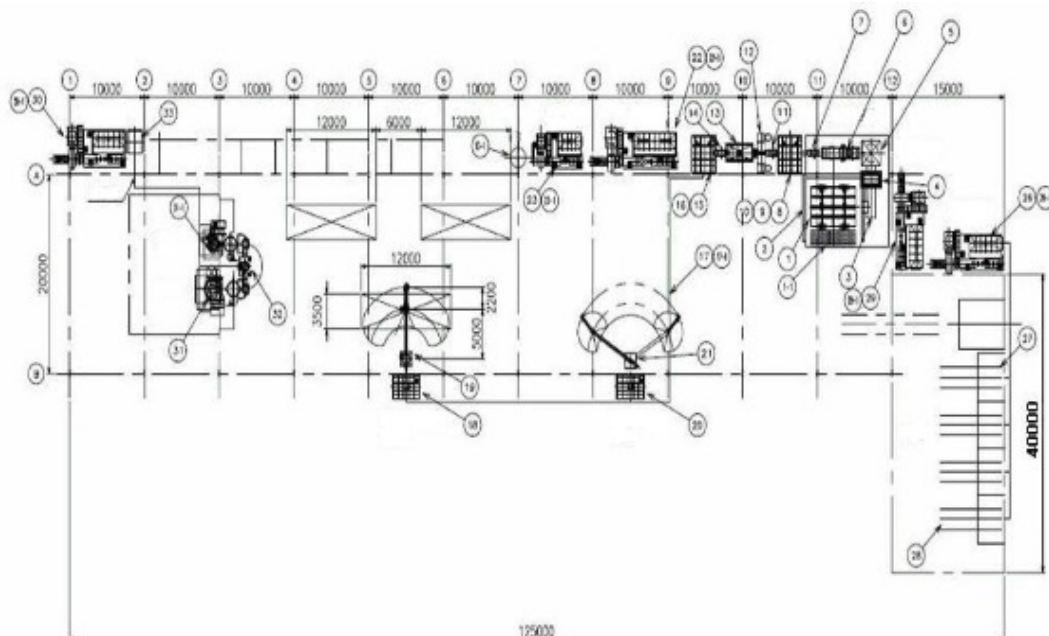
# High Quality Wind Turbine Castings by KOTEK



KOTEK starts running the most modern cast iron foundry beginning in 2009 at Dasan Foundry Industrial Estate in Korea.

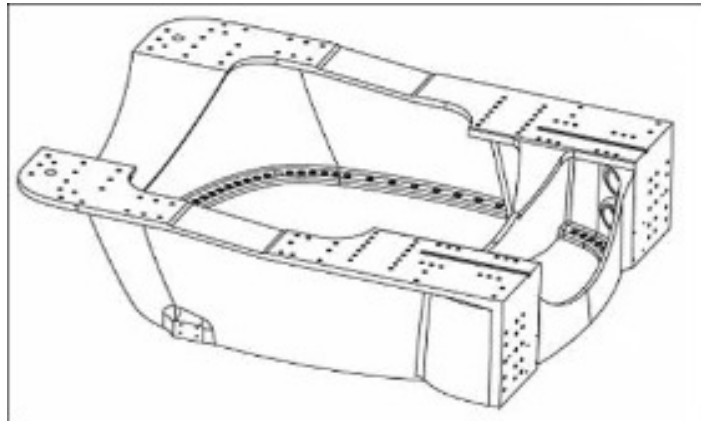
KOTEK foundry is equipped with modern melting, molding, fettling and laboratory systems as well as state-of-the-art software for optimization of gating systems and process control of complicated iron melts for wind turbine castings.

KOTEK foundry engineers and workers have expertise backed by an average of 20 years experience in the production of big iron castings weighing 10~60MT for wind turbine and shipbuilding industry.

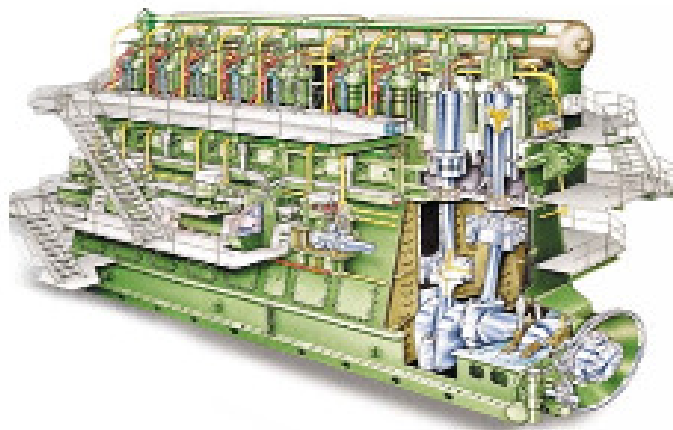


## Products:

- Wind Turbine Castings: Rotor Hubs, Nacelle Bed Plates, Others



- Diesel Engine Castings for Shipbuilding and Generators



## Foundry Building and Equipment

- Dimensions: 25m(W)×150m(L)×15m(H)
- Overhead crane (max. lift height) : 11m(H)
- Max weight of object to be handled: 60MT(MT-metric ton)



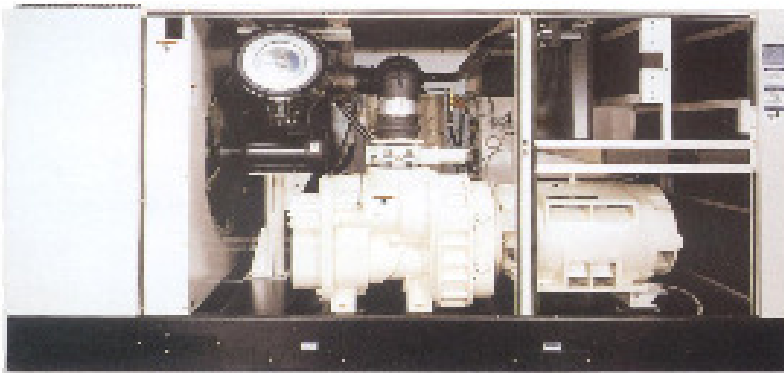
### Induction Melting and Holding Furnaces:

- 1×2500kw+2×3MT
- 1×1200kw+1×15MT



### Sand Mixer:

- 2×20MT/hour



### Air Compressor:

- 3×(75kw/100hp)



Shot Blast Machine:

- 1×20MT/batch1



Shake out machine:

- 1×20MT/hour



Overhead Cranes:

- 2×5MT, 2×10MT
- 3×20MT
- 1×30MT
- 1×30/30MT



Dust collectors:

- 1×400m<sup>3</sup>/min,
- 2×600m<sup>3</sup>/min,
- 2×1000m<sup>3</sup>/min

## Process Control System

- Simulation for optimization of gating system (Flow / Solidification / Stress simulation)
- Thermal analysis for optimization of base & final iron
- Spectrometer
- Physical property testers
- Sand testers

### Minimum defect with consistent quality can be guaranteed

Kotek will provide wind turbine OEMs with high quality, high reliability castings by employing state-of-the-art equipment, software, and expert foundry staff.

It is notable that the foundry will be differentiated from conventional foundries by the utilization of the most advanced software, controlling the process of melting and molding respectively. Kotek foundry staff is fully trained in the use of the software since 2000, and Kotek has a technical collaboration with a world-class wind turbine casting foundry in Europe.

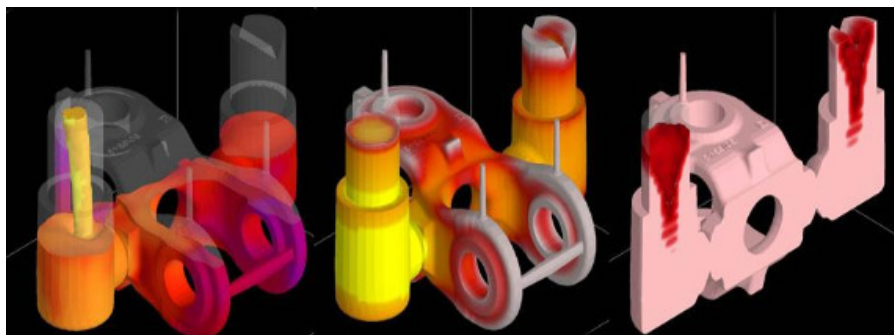
### Simulation Software for Iron Flow, Solidification and Stress

The progression of liquid metal flow is visualized in 2D or transparent 3D and can be viewed during or after the simulation.

Heat transfer is fully taken into account, enabling the foundry man to predict and study not only flow but also temperature changes in the metal and mold. Different alternative positions and dimensions of cooling and heating channels can be tested as well as cycling to a steady state temperature.

The influence of gravity is taken into consideration during solid simulation, which allows more accurate prediction of size and position of shrinkage cavities.

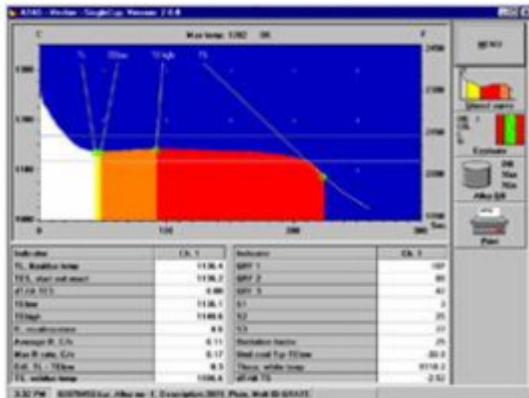
Flow and Solid simulations visualize the consequences of the gating system and pattern design. Casting defects such as oxide inclusions due to excessive turbulence, cold-shuts, shrinkage cavities and slag inclusions can be avoided by optimizing the design of the gating and venting system.



## Thermal Analysis Software

An innovative system for process-control of gray and ductile iron is being employed in Kotek foundry. Based on advanced thermal analysis combined with artificial intelligence technology, it allows the foundry to reduce casting defects, improve yield and reduce variations in physical properties. It is also a great tool for increasing metallurgical competence.

It is a knowledge-based computer system for optimization, quality assurance and correction of the melting and treatment processes for cast iron alloys.



Cooling curve and digital parameter values of each melt tested.



Artificial intelligence technology judges the quality of tested melt

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