

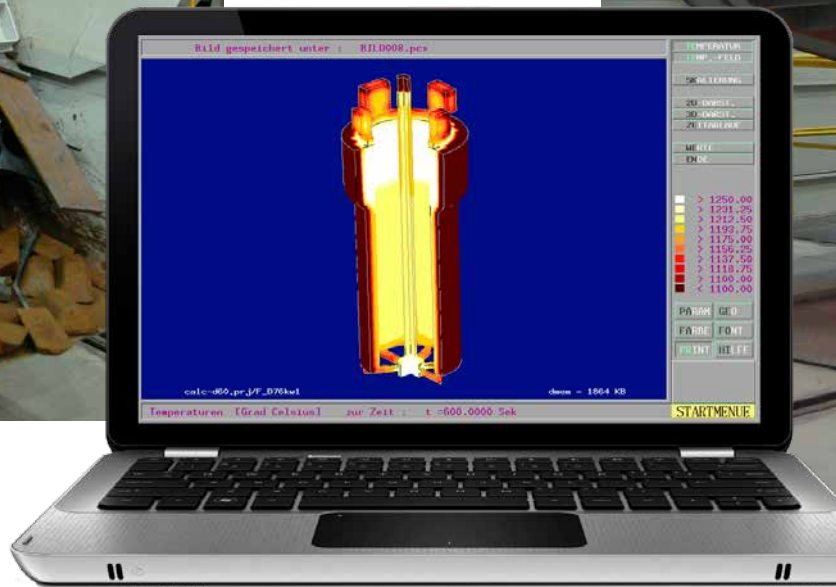


Large castings foundry south korea

MAC GmbH | Consulting and Engineering was approached by a South Korean machining company since they did not get the number of raw castings with the required metallurgical structure for marine engine cylinder liners on the market. The idea was to build an own foundry and to start production for own supply. Design capacity for the foundry was set to 11.000 cylinder liners per year with an average weight of the raw casting of 9 metric tons. Due to the special grey iron composition the foundry engineering was closely connected to the casting technology, both are rendered by MAC.

IMG 01 // Foundry hall building structure on former textile industry site.

IMG 02 // Mould with pouring basin ready for pouring.



The new site was a brownfield site used for textile manufacturing before. Fortunately it was located in the vicinity of the customers machining installations. Existing buildings had to be checked for suitability. They placed additional boundary conditions on the layout of the foundry. Further on the **customer requested a design modification which allowed a step-wise realization** without compromising the overall solution. In the beginning of July the foundry concept reached a level of sophistication which allowed to start immediately with demolishing and construction works. In parallel the equipment was specified and negotiated with international and local foundry equipment manufacturers.

A good amount of effort was dedicated to the working conditions to be expected. The result of simulations of the climatic conditions inside the building were taken into account for the design of the building and the ventilation. While one part of the project was concentrating on the erection of the foundry other consultants initiated the implementation of the casting technology. Pattern maker had to be sourced and to be familiarized with the casting

IMG 03 // **Charging car loaded with steel scrap and pig iron forming the charge of a special grey iron alloy.**

IMG 04 // **Mould filling and solidification simulation for determination of gating system and riser design.**



technology which had been used never before. Unskilled operators from different Asian countries had to be trained on and off the job. Therefore detailed process descriptions visualizing each and every step of the production process had to be created.

The project team consisting of customers employees and MAC consultants managed to come along with equipment installation, implementation of technology and finalization of the building in record time. In the beginning of December, **not even 6 month after construction works had started the foundry was ready for first pouring**. Due to the in depth preparation it took only 3 trail runs to reach the mechanical values and grey iron structure required by international customers for the cylinder liners.

IMG 05 // **Melting of special grey iron alloys in the new furnace installation.**

BACK IMG 06 // **Short timeline required first pouring for certification of castings already when final installation works were still ongoing.**

BACK IMG 07 // **First pouring of a permanent mould.**

**The scope of services rendered by MAC in this project:**

- ▶ development of the foundry concept suitable for a combination of permanent mould with furan cores
- ▶ numerical simulation of material flow and internal transport processes of moulds, mould boxes, sand cores and castings
- ▶ development of the casting technology including pattern, permanent mould, gating and riser system design incl. simulation of form filling and solidification
- ▶ definition of an energy saving preheating and drying process for the permanent moulds
- ▶ equipment specification and local sourcing of equipment suppliers
- ▶ sourcing of 2nd hand equipment in Europe for back-up and auxiliary equipment
- ▶ supervision of the installation and commissioning of equipment
- ▶ training of operators, shift leaders and management
- ▶ implementation of quality check procedures in the production process
- ▶ support within the customer acceptance procedures

MAC GmbH | Consulting and Engineering
Sennhüttenstrasse 5 | [CH-8542 Wiesendangen](#)
Telephon +41 52 233 96 86 | Fax +41 52 233 96 87 | Skype: mac.office

info@maceng.ch | www.maceng.ch

MAC GmbH Deutschland | Consulting and Engineering
Thälmannstrasse 20 | [D-04442 Zwenkau](#)
Telephon +49 351 833 622 0 | Skype: mac.office.de