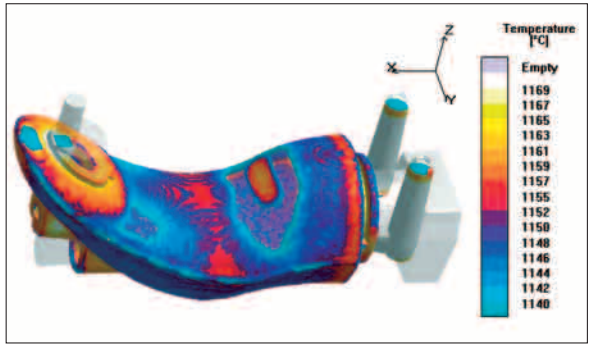

Technical aids for industrial casting

Then following powerful CAD programmes are used as appropriate to the task and customer's requirements:
- CATIA
- Pro/ENGINEER
- I-deas.

To enable data from other CAD programmes to be processed, various interfaces are available. These are necessary to read data into the simulation or finite element programmes.
The following standard interfaces are available:
- IGES
- VDA
- STL
- STEP.
- Intel Xeon

We use the ANSYS Mechanical programme for the optimisation of the dimensions and weight of components by means of the finite element method.

The MAGMASOFT® programme is used to simulate the casting process (mould filling and solidification).

Three- and five-axis milling machines are available to manufacture the models.

The calculations are performed by powerful computers such as:
- Intel Xeon workstations for the CAD design and Fe analysis
- Cluster-PC with 8 proces sors for the casting simula tion

Contact addresses

We will be pleased to answer any questions you may have.

Please give us a call or arrange a visit.

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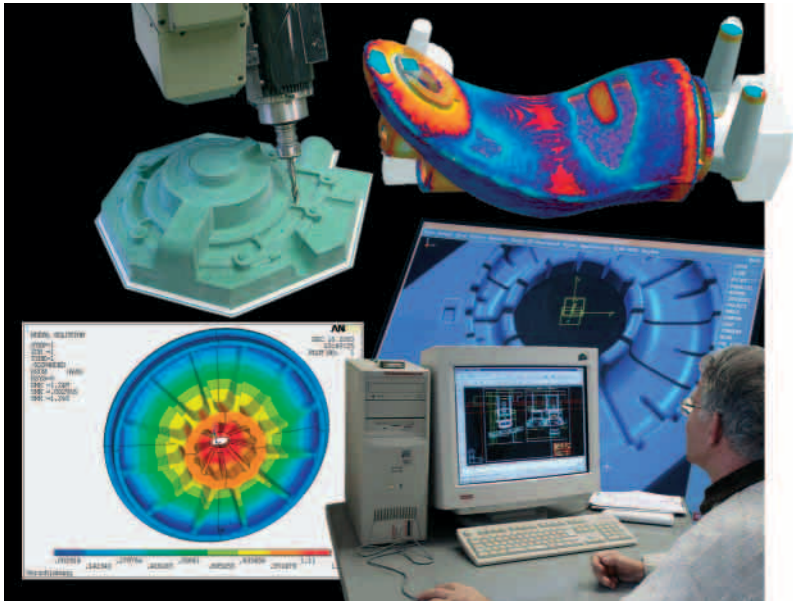


Engineering Center

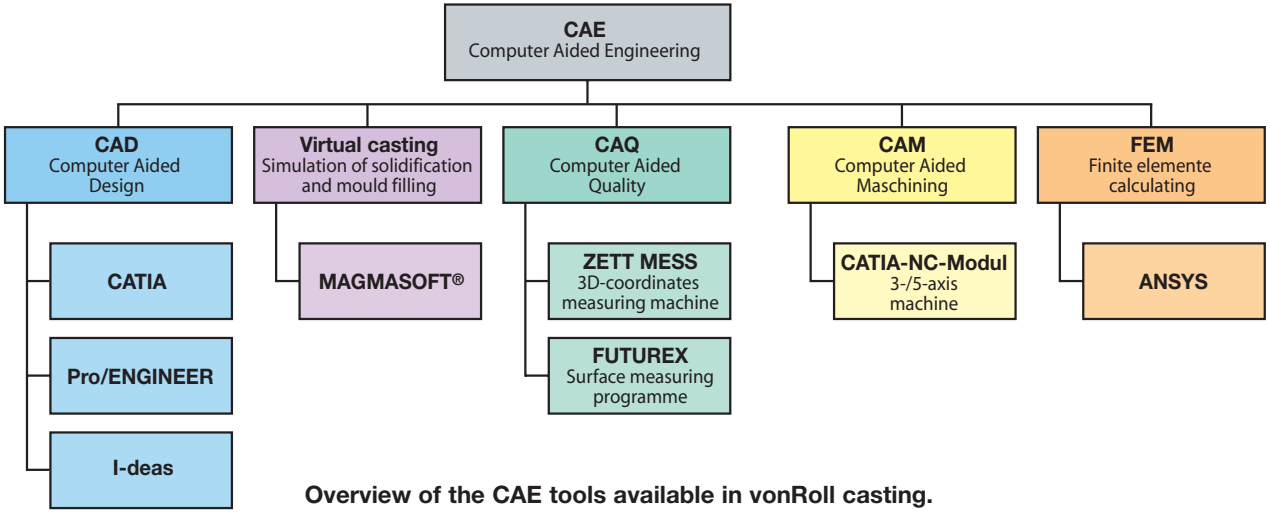
Engineering Center: Our know-how for your success

Because of its many years experience, the Engineering Center of vonRoll casting has comprehensive know-how in the field of industrial castings, that we make available to our customers. Thanks to extensive investment in the future, we have available the most up-to-date tools for simulation of the complete casting process. Furthermore, we have the capability to plan, design and expertly cast new parts to meet the demands of any operating environment. Simultaneous Engineering in partnership with the customer is a feature of vonRoll casting.

Many businesses today no longer have the capacity or experience of casting technology necessary to develop new castings. The Engineering Center can take over this entire task completely from the customer.

Development and design of new castings

Using modern CAD and finite element progammes, we can find the best design solution to meet all operational stresses, whether of a mechanical (static or dynamic) or of a thermal nature. In such cases, the focus is very oftern on reducing weight while at the same time meeting the same functional requirements. You, as our customer, will be intensely involved involved in this preparatory phase, thus ensuring that a prototype of the highest quality and reliability can be delivered in the shortest possible time.
Parallel with the development phase, the CAD data is fed to the MAGMASOFT® simulation programme and the technical casting aspects of the prototype design are checked.



Overview of the CAE tools available in vonRoll casting.

Simulation of solidification and mould filling

Casting simulation is today recognised as an outstanding tool for calculating and documenting casting processes. This tool provides the information necessary to assess the expected quality of the casting.

The ability to visualise previously-hidden physical processes provides both foundry workers and customers with a far better understanding of what really happens.

The main purpose of the simulation is:

- To check the solidification process quickly and efficiently
- To avoid shrinkage and porosity
- To minimise residual stress and distortion
- To reduce the number of prototypes and trial castings.

This enables the development time of a component to be substantially reduced. Casting simulation also pushes the technological boundaries of foundry engineering. It can be used to design lightweight components of nodular (spheroidal) cast iron.

Different wall thicknesses in the casting mean different solidifcation that can lead to stresses on cooling. This can be minimised or even avoided by suitable structural design.

Prototype production with CAD and CAM

When the components have been released by the customer, the electronic data in the CAM module is used to generate a milling programme. Depending on the shape and size of the model, the milling programme is transferred to a three- or five-axis milling machine. The models are made of plastic of different quality to suit the required service life.

Tasks of the Engineering Center

The Engineering Center undertakes various tasks within both vonRoll casting and vonRoll infratec:

- Optimisation and development of exacting industrial components for engines and mechanical engineering, power generation, water supply and builder's ironmongery
- Supporting foundries in the development of new castings in partnership with customers
- Conducting customer and technical seminars
- Carrying out CAE (hardware and software) training and coordination at foundries.