



The iron foundry Torgelow is technically and structurally capable to cast large-scale castings in series (Photos: ASK)

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Wind power systems as growth driver for the foundry industry

Iron foundry committed to expansion into innovative high technologies

Climate change, restrictions in CO₂ emissions and the preference given to renewable energies have fostered the growth of wind power as an important source of energy. Wind power is currently used in more than 80 countries, above all in the USA, China and India. The largest users in Europe include Germany, Denmark, Spain, Portugal, the UK and Ireland. According to the EWEA (European Wind Energy Association), over 40% of the installed energy generation potential in Europe is based on wind energy systems.

For 2010 and 2011, the EWEA expects double-digit growth rates in the global market for wind energy systems. By

2017, wind generators will exhibit a fivefold increase in performance. The wind farms in offshore areas are especially promising.

From these developments, it can be seen that wind power systems represent a strong driver of innovation and growth due to their advanced technological demands – which applies for the foundry industry as well – provided that the plants can fulfill the high-technology requirements through flexible orientation and cost-efficient product management.

The management of Eisengießerei Torgelow – in the east of Mecklenburg-Vorpommern/Germany – was already recognizing these as strategic challeng-

es six years ago. After the reunification of Germany, the company, with a history of more than 250 years, struggled to deal with the necessary transitions, but was always very proud of the quality of its products, which is based on the highly qualified nature of its employees. The experience passed on through generations ensured a high degree of technical competence in the area of hand-formed gray and nodular cast iron.

Competence, quality and reliability are the prerequisites

Strong financial partners, a motivated team and the continuous further development of metallurgical expertise

have permitted cast parts to be produced in Torgelow for technologically demanding applications with complicated component geometries. Extensive investments of over 50 million euros have been made in order to establish the largest hand molding and steel blasting shop as well as the most modern melting facility in Europe. Equipped with this high technology, the company produces cast parts with unit weights of up to 150 t. With its technical equipment and structure, the iron foundry can now produce large-scale cast parts in high volumes in series production and is oriented toward both quality and flexibility in production in order to guarantee the required reliable delivery. The foundry is therefore well prepared for future market requirements.

The goal is not to produce various cast parts in the shortest period of time, but rather to make use of opportunities in expanding markets. In addition to the special technical equipment, the most important success factors of the company are the high degree of competence in assisting the customer in product development and redesign, along with technologically optimized products, quality in their execution, service, reliability and speed.

“Wind energy is a strong pillar which is perfectly suited to Eisengießerei Torgelow”, according to CEO Peter Christian Weilguni. “It’s still a young industry that requires high quality castings and that is exactly what we offer our customers.” For some years now, rotor blades, frames and generator housings for wind power systems have been cast in Torgelow (**Figure 1**).

The business area of renewable energy is an absolute high-end industry that places corresponding demands on the materials and production equipment used. This necessary quantum jump was accomplished in Torgelow. The production of the first 80-t cast part – which is now in series production – represented intensive experience for the iron foundry and reflects the advance in product development that is increasingly demanded by the customer – away from the small systems and on to multi-mega-



Figure 1: Among other products rotor blades, frames and generator housings for wind power systems are cast at the Torgelow foundry

watt systems that the new types of applications require. Large wind power system manufacturers such as the German companies BARD, SWP (Siemens Wind Power), REpower, Enercon or their Spanish competitor Acciona place their trust in the skills of Eisengießerei Torgelow.

Strategic partnerships foster technological leadership

A functional value added chain plays an important role in achieving this. Innovations are developed and made ready for production together with suppliers and customers. “Such strategic partnerships are an important building block for the future development of the iron foundry”, Weilguni emphasizes.

A classic example of this is the cooperation with the manufacturer of foundry additives – ASK Chemicals based in Hilden/Germany. Together with the ASK development team, new “core” concepts were conceived for production processes in the core-moulding plant that exceeded the requirements in the area of large-scale casting. In the process, the competence in development and experience provided by ASK was primarily focused on the adaptation of applications with sulfur boundary layers and special resins that exhibit a high degree of slip-

page or finishes that can withstand high thermal loading (**Figure 2**).

The uniform hardening of cast parts represents a special challenge. Today, specifically developed casting additives ensure the quality of the ever larger cast parts. The optimization of control systems for sand mixing equipment also plays an important role in the production process. The adaptation of the furan resin system and the dosing of the mixer had to be adjusted to the dimensions of large-scale cast parts. The objective was to quickly mix the sand for the 80-t cast parts and to work effectively in the process. This required that the furan resin system be equipped with specifically optimized components and that the correct mixing ratios were applied (**Figure 3**). Promptness, economic viability and precision were indispensable requirements in this case. These requirements were also solved within the framework of the strategic partnership consisting of ASK specialists, mechanical engineering manufacturers and in-house specialists. Today, the iron foundry operates with sand mixing systems which are precisely optimized to large-scale casting and which permit extremely accurate dosing.

For the selection of suppliers, Torgelow considers not only the price as a deciding criterion, but other important assets as well. Greater impor-



Figure 2: Specifically developed additives for foundries by ASK Chemicals ensure the quality of the castings that become ever bigger



Figure 3: The right mixture of furan resin for large-scale cast parts is an indispensable success factor

tance is placed on deliverability, in order not to jeopardize the production sequence – a possible risk that is often overlooked in times of economic pressure.

A particular strength of ASK Chemicals in this partnership is its single-source structure. Torgelow obtains everything it needs with respect to foundry chemicals from Hilden. In the meantime, ASK is also responsible for warehousing and logistics. “In such development and produc-

tion processes, we make our specific expertise, the entire product portfolio and our service available to our customers,” as Stefan Sommer, CEO of ASK, summarizes the basis of the partnership. For customers such as Eisengießerei Torgelow, additives are specifically adapted to local circumstances. Information about new product solutions from the research center is supplied to the customer early on so that it can expand its technological leadership.

Energy sources of the future

Wind energy is one of the few industries which achieved significant growth globally in 2009 despite the economic crisis. According to statements from the German Wind Energy Association, 952 new wind power systems with a total power output of 1917 megawatts were installed in Germany alone in that year, which is roughly equivalent to the power generated by 15 nuclear power plants. The future belongs to offshore wind farms – from which the foundries will also benefit, insofar as the high technical requirements can be met.

Further challenges for the future

Those who stand still will be left behind. There are also challenging tasks for the future – for example, the further optimization and adaptation of the binder systems in use. The iron foundry currently operates at a standard capacity of 70 t of sand mixture in a ratio of 1:6 per hour. In the casting process itself, 80% of the sand is subject to high temperatures. In the opinion of technical experts in Torgelow, this process is still polluted with too much carbon and sulfur. As the foundry team sees it, the regeneration of the sand must be optimized from a chemical, wet-chemical or physical standpoint such that annealing loss is reduced. For the research team at ASK, it was a challenge to develop its binder system to meet these requirements.

CEO Weigluni is impressed of the collaboration with partner ASK Chemicals. For him, adherence to agreements and a highly reproducible product quality are the most important things in a partnership. “Only in this way – also in consideration of the supplier – can we achieve a customer relationship which is extremely important for our company and guarantee a binding consultation under difficult and diverse customer requests and demands,” he explains, satisfied with the growing trust and the long-term cooperation.

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