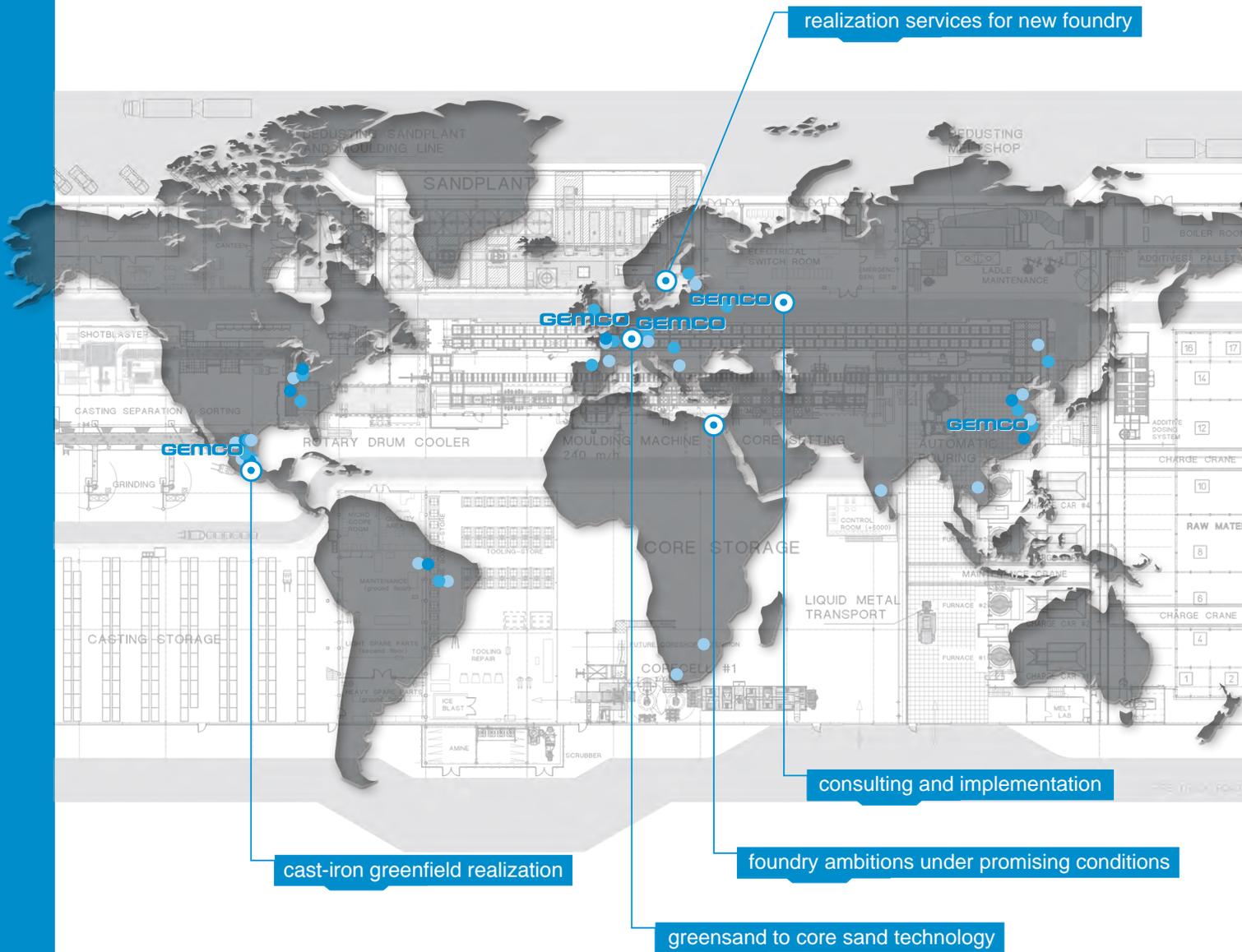


# GEMCO®

since 1978 complete foundry solutions



realization services for new foundry

consulting and implementation

foundry ambitions under promising conditions

greensand to core sand technology

cast-iron greenfield realization

## FOUNDRY NEWS

Newsletter 14/15

## Technology and trends in casting manufacturing

In this edition you will find a brief account of foundry projects that we have implemented. Some of the projects we performed a little while ago, some more recent and some are actually in full swing.

These days, when I visit our customers or new prospects, I am asked about the future in our industry. In the lively conversations that follow, topics such as Industry 4.0, IOT, Sustainability, 3D Printing and Environmental impact are addressed.

As an engineering partner for new foundries, as a contractor for the realization and as a consultant for improvements, the question arises what these topics mean for Gemco. “How do we ensure that future foundry designs will make you winners”. I often have to say that buying good equipment is only part of the solution. The added value that Gemco offers depends on how this equipment is built into the entire production facility, so that no bottlenecks occur, and that support systems are adequately designed; ensure that maintenance of the equipment can be carried out easily and under the right conditions, with the design being appreciated by workers in terms of movement, lighting, noise and dust.

IE 4.0 is becoming increasingly important and Gemco is since long trying to find the competitive edge also in this area. Today, more and more equipment suppliers are proposing sensors to link SCADA systems that enable analysis of equipment performance, such as cycle times, predictive maintenance and other measures on level 2 systems. At a comparable speed, 3D design of equipment has become the standard. In the (near) future we will see the rise of 3D design with integrated sensor technology that finds its way into our reality, our industry. It is already happening in warehousing and high-end production sites where operators and staff, make more and more use of AR / MR glasses that display data-driven 3D information onto the real live environment, i.e. for maintenance, operational or instruction purposes.

All in all, a very exciting and optimistic future, in which forthcoming design of factories with unlimited possibilities for production and efficiency improvements will go hand in hand with ergonomic and environmental sustainable solutions.

If you wish to know more, please visit us at one of the exhibitions or contact us.

Ir. Bas van Gemert  
Managing Director

over **1200** **PROJECTS**  
**Worldwide**

CONSULTING ENGINEERING REALIZATION



# LIBERTY

## Automotive Light Metal Low Pressure and Gravity Die Casting Business in Europe

A comprehensive market survey on automotive light metal casting industry in West and Eastern Europe including Turkey

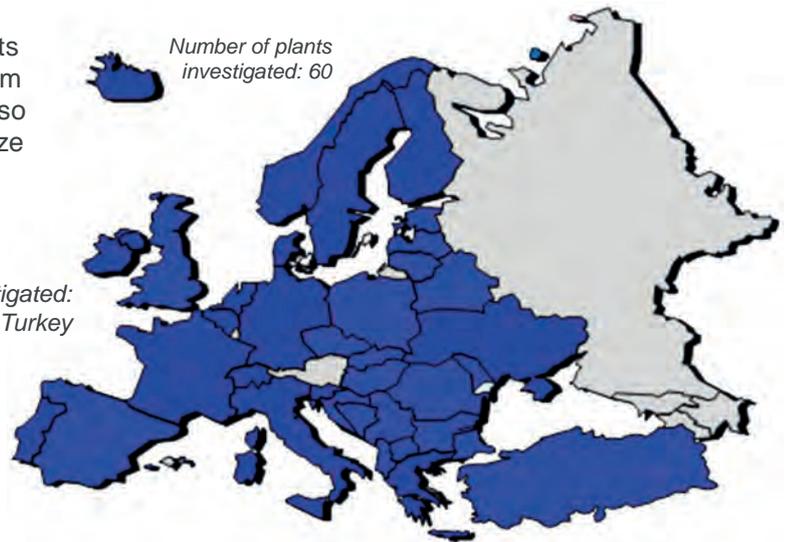
### About Liberty

Liberty House is part of the GFG Alliance, a British Industrial Group. Within the alliance Liberty focusses on industrial and metals business. Liberty is supported by the GFG Foundation which focuses on the retention and creation of engineering and industrial skills. Through its forward-looking GREENALUMINIUM and GREENSTEEL strategies, the GFG Alliance promotes industrial revival based on low-carbon and sustainable production methods. Its commercialization of new technologies and the regeneration of manufacturing and engineering skills are cornerstones of the Alliance’s plan to deliver a step change for manufacturing in key regions worldwide.

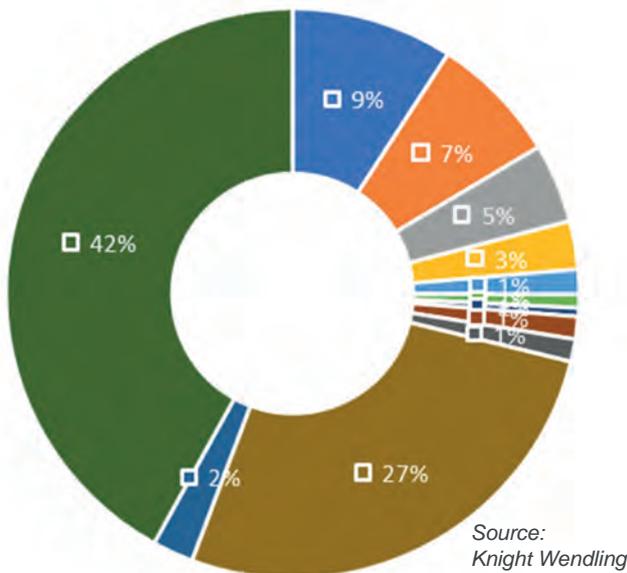
### The survey

For Liberty France, Knight Wendling was asked to perform an in-depth survey of the European aluminium automotive casting market with focus on Low Pressure Die Casting (LPDC) and Gravity Die Casting (GDC). Liberty runs primary aluminium plants and wants to invest into downstream engagements of various aluminium castings applications. Either greenfield or brownfield.

The study is important as Liberty is strengthening its presence and role as a serious player in the aluminium (casting) market, not only in the UK and France but also beyond these borders. In effect, Liberty looks to organize its activities more into globally oriented endeavours.



Current aluminium casting content in cars, a share that will increase in the years to come.



In addition, there is a strong consensus for a more sustainable and circular economy, and aluminium allows for a high degree of reuse/recycling in industry processes. Furthermore, “driving green” requires “losing weight” thus the use of lightweight aluminium cast parts in transportation vehicles, whether for passenger or commercial use, will only rise in the years to come. Within Liberty’s strive for a greener economy, the ambition to invest in existing production sites whilst retaining valuable production skills in place is an important part of their philosophy. The report established by Knight Wendling clearly maps out the activities in the chosen sectors and serves as support during decision-making phases.

Consultants:  
Knight Wendling GmbH  
Dr. Klaus Schmitz-Cohnen

- Engine block
- cylinder head
- subframe
- knuckles
- control arms
- e-housing
- battery housing
- turbo charger
- caliper
- wheels
- pistons
- others



## SCANIA Scania selects Gemco for Project Realization

Scania is a world leading manufacturer of trucks for distribution, long-distance and heavy transport applications, buses and coaches. The Swedish provider of transport solutions strongly focusses on innovation, environmental impact and customer satisfaction. This includes the development and improvement of a new generation truck engines for alternative fuels and electric drives. To support its goals, Scania currently invests in the realization of a new state of the art foundry for the production of key- castings for the different generations of truck engines. With the new foundry the casting capacity can be tripled whilst a 50 percent reduction in energy consumption can be achieved, in comparison to applied technology and practice in the current foundry. Scania chose Gemco for project realization services.



Artist impression

Picture: courtesy Scania

The decision to build a new foundry was agreed after an extensive period of close cooperation between Scania and Gemco in which different alternatives have been considered and carefully analyzed, including the modernization and extension of the current foundry. For Scania it means that Södertälje remains the epicenter of development and production. The new foundry will employ around 200 employees.

The new to build casting facility will produce over 60.000 tons of good castings. It will apply the most up to date technologies and several brand new technological solutions that will allow Scania to have both efficient as well as sustainable production. Notwithstanding a tripling of production capacity, the improved materials handling and newly introduced sand recycling will significantly reduce the required transport per cast unit. Energy usage will decrease while improved casting processes and heat recovery will allow for energy gains.

Solutions are designed and created in multilateral cooperation between Scania production, Gemco engineers and manufacturing companies, making sure a thorough evaluation of the solution is made from each perspective, such as efficiency, maintainability, operator safety and environmental impact, before deciding to the principle. Gemco has engineers residing in Södertälje in order to achieve the closest possible cooperation with Scania at all time.

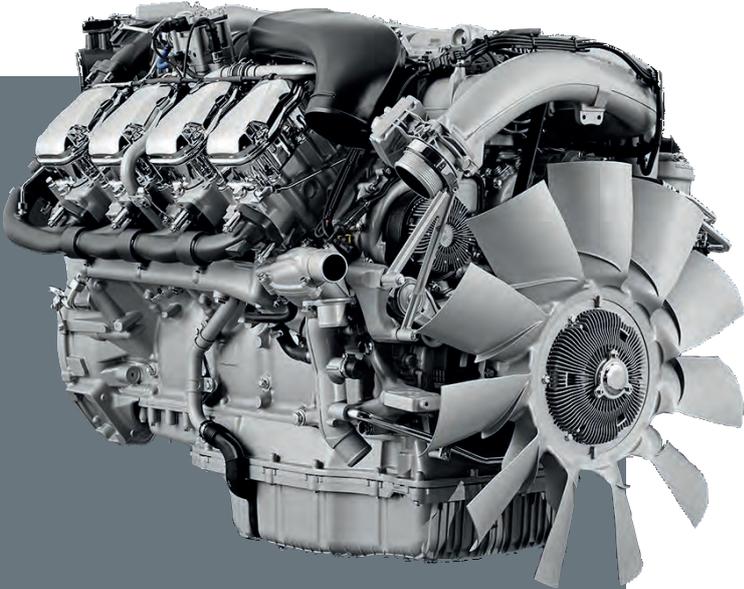
# Services for New Foundry in Södertälje

The new foundry enables Scania, and the group it is part of, to gain an advantage in several areas such as:

- co-development of engines and its key components.
- co-operation and short cycles between all manufacturing stakeholders such as foundry, machine-shop, assembly and testing
- easy and fast delivery times to the internal and external customer
- cost savings on scrap, logistics and recycle material

The foundry will be realized on new factory premises of approximately 98.000 m<sup>2</sup>. SOP is expected in 2021.

Scania V8 engine  
Picture: courtesy Scania



Product:  
engine heads, engine blocks  
Metal:  
grey iron, Compacted Graphite Iron

The ground works for the new foundry are in full swing.



## Turnkey intergration

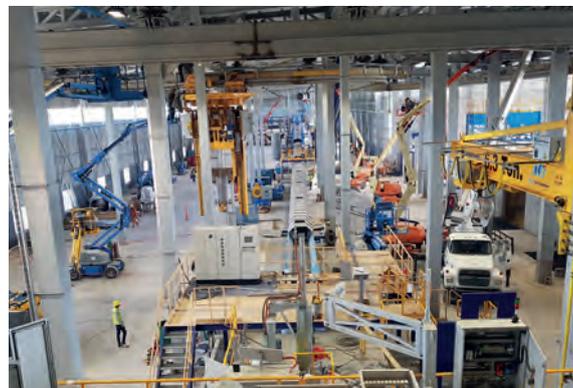


MTI is a leading metal casting company that produces over 300,000 tons per year of high quality grey, ductile, and aluminum castings for a variety of industries. MTI's headquarters are in Auburn, IN, USA and the company has multiple plants in North America. To serve MTI's customers in Mexico a new casting facility has been realized in San Luis Potosí, Mexico.

Gemco delivered the project turnkey including installation and commissioning. The project includes vertical moulding with automatic pouring, inline shotblasting and a fully integrated line for bringing returns crushed back into to charge area. The charge area is equipped with a fully automatic charging system that introduces returns and scrap into the induction furnaces. The liquid metal is transported by an automatic monorail system to the automatic laser-controlled pouring machine. The melting area is designed to safely melt zinc coated scrap.

The foundry design permits easy access for maintenance on all critical items. The foundry has limited pits and the plant is designed so it can be extended for a second production line.

The new casting facility will enable MTI to provide its customers in Mexico with the highest quality ductile or grey iron castings for automotive and other applications.



## Greenfield realization in Mexico



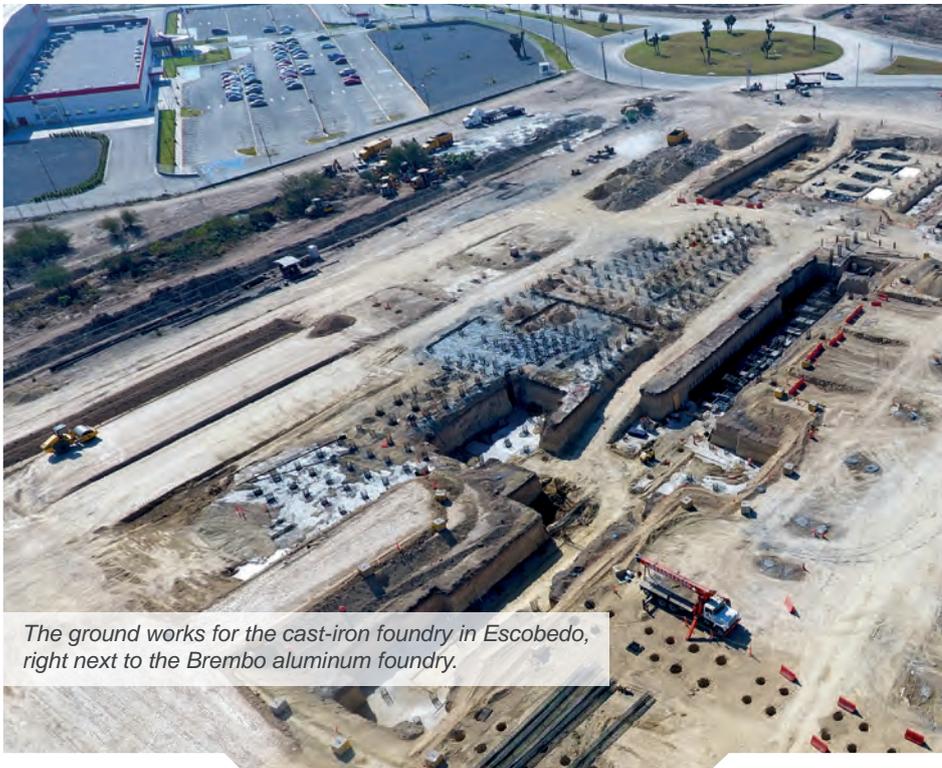
Brembo is world leader in brake disc technology. When Brembo decided to establish a new foundry in Escobedo, in the Monterrey area in Mexico, Brembo chose Gemco to be their partner for the layout design, engineering and equipment installation of the greenfield foundry.

Casting operations in Escobedo started in 2017 and the foundry produces 100,000 tons/yr of liquid metal for the making of rotors and discs. Cast products are destined to American, European and Asian OEMs with manufacturing facilities in Mexico, entirely in line with Brembo's philosophy to produce in the vicinity of their major customers.

Product: brake discs, brake drums, calipers  
Metal: grey iron, ductile iron



*The dynamics of a greenfield casting facility in the making, with sand plant in construction on the outside and the casting line taking shape on the inside (melting, pouring).*



*The ground works for the cast-iron foundry in Escobedo, right next to the Brembo aluminum foundry.*



*Gemco also assisted Brembo with Engineering-, Installation- and Project Management Services for an expansion of the Brembo brake parts foundry in Dabrowa, Poland. (For Brembo Poland this was already the second expansion) This 3rd production line produces also high quality ductile brake parts with a total capacity of up to 80,000 tons of good castings/yr, making the total capacity of Brembo Poland over 250,000 tons/year of brake parts.*



Artist impression of the new foundry

GEMCO was awarded the turn-key contract for the realization of this foundry project. The new grey and ductile iron foundry will be around 8,000 m<sup>2</sup> and is located in Probištip, northeastern Macedonia. Cranfield foundry aims to service customers with competitively priced and above all quality castings. The foundry is equipped with a flaskless molding line that can run up-to 100 molds/hr. The liquid metal comes from two 5-ton induction furnaces. The facility will produce grey iron castings of EN-GJL 150-350 and other related grades, as well as ductile iron castings of EN-GJS 350-800 and other related grades. Construction is under way and SOP is scheduled for the second half of 2019.

Product: municipal castings, engineering castings  
Metal: grey iron, ductile iron

Infrastructural development in Macedonia and neighboring countries is on the rise and the region offers excellent investment conditions.

Appropriate reasons for Cranfield to invest in a new foundry facility for Iron Castings.



Contact:  
Rashad Iskenderov, Jeroen Geraedts





Country: Egypt

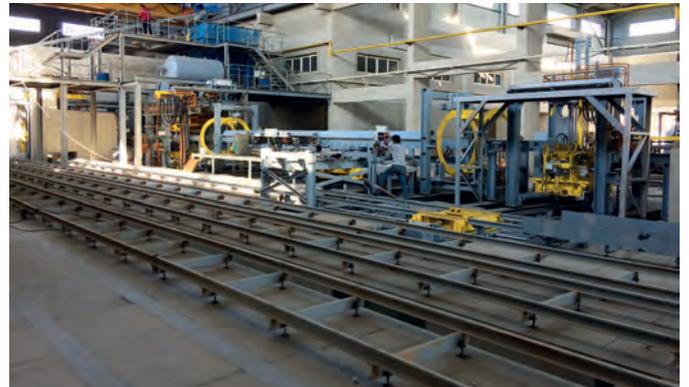
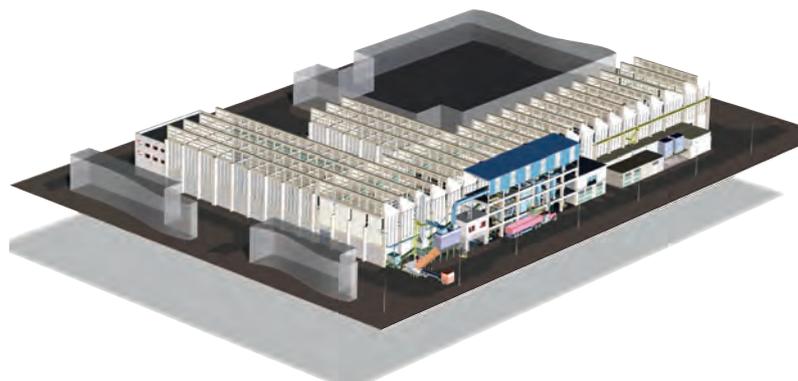
Metal: grey and ductile iron

Process: horizontal greensand moulding technology

Gemco is delivering a turn-key foundry project including all engineering, equipment, utilities, electricity, technology and training to **Helwan Iron Foundries**, located in Helwan, 30 km south of Cairo, Egypt. HIF supplies a variety of customers in automotive, railway, and cement industries with custom products.

The new foundry (one of several foundries on the site) is equipped with an automated moulding line that can run up to 50 moulds per hour. The plant will produce approximately 20,000 tons of good quality castings manufactured with the latest greensand technology. The supporting departments involve medium frequency induction melting, cold box core-making and steel-shotblasting cleaning technologies for the products. The foundry is set up to produce ventilated and un-ventilated disk brakes and disk drums for small trucks.

For future needs, this capacity can be increased to 70 moulds per hour.





**KAMAZ**

## KAMAZ PTC: consulting and implementation

**KAMAZ Group of Companies** is the largest automobile corporation in the Russian Federation, and one of the world's top 20 heavy-duty truck producers.

On the industrial site of Naberezhnye Chelny in the Republic of Tatarstan, Russian Federation, the all-encompassing production base of KAMAZ PTC covers the overall truck manufacturing cycle, from design, production, assembly of vehicles and components, up to sales of the finished products and service backup. As part of this process several major plants and operations are located on this industrial site. These include: Foundry and Forge Plant, Engine Plant, Press and Stamping Plant, Automobile Plant and Repair and Tool Making Plant.

KAMAZ foundry operations in Chelny include i.a. the cast iron-, steel- and non-ferrous casting facilities as well as a foundry tooling production. Besides the 100% of all castings for KAMAZ trucks, an ample variety of castings for other customers are produced in Chelny.

KAMAZ assigned GEMCO the task to perform a technical audit for the 3 mentioned casting facilities. The audit comprised the complete operations from equipment and foundry logistics, up to and including the level of present cast metal knowledge (of the employees). The second phase of the audit involved a full product analysis for each facility. The assessment was completed with a benchmark analysis that covered all foundry processes with significant impact on overall efficiency and performance of the foundries.



*Gemco team at Kamaz*

GEMCO has started with the project management and engineering of the modernization of the iron foundry, followed by the foundry ramp-up. The foundry produces engine blocks and heads and other commercial vehicle's parts. This modernization project will allow KAMAZ to optimize their foundry capacity and reach even higher quality standards.

Product: commercial vehicle castings, hubs, brackets, housings

Metal: grey iron, ductile iron

Contact: *Rashad Iskenderov*



# Sand Cleaner 2.0

Improved design for more capacity, less maintenance, more efficiency

Since its introduction, in the early 90's last millennium, the Gemco SAND CLEANER runs successfully in a number of greensand foundries. The principle of the SAND CLEANER is basically a dry mechanical process based on the grinding of the individual grains of sand, combined with continuous dedusting. By grinding, the grains of sand are cleaned of adhering binders and other debris and the grains of sand are rounded off. The reclaimed sand can be reused as core sand.

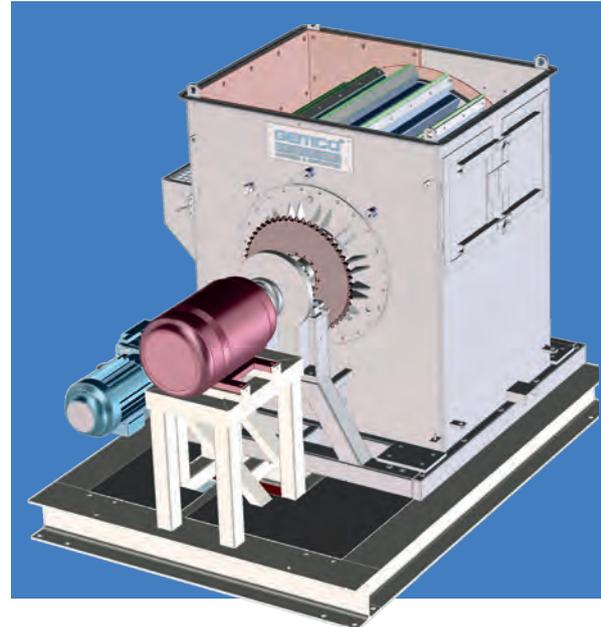
For the new generation SAND CLEANER the objective was to achieve augmented output and higher uptime. In order to determine the upgrade and eventually plan the implementation of the required adjustments, several modifications were tested in SAND CLEANER(s) currently in operation at the customer.

**Higher inlet temperatures** have been made possible through adapting the bearings and mounting the sanding drum. By selecting materials that are more resilient, the SAND CLEANER can better withstand variations in sand temperatures. This allows for hotter sand to be processed, which requires less sand cooling.

**Higher drive power and larger volume** increase the capacity of the system. Higher drive performance and an improved sand feed system increased plant capacity by 15%. The batch weight was increased by 100 kg to 850 kg with unchanged cycle times.

The improved design and choice of more wear-resistant materials have further **reduced maintenance costs**. Just once a year, a full maintenance is required in which the grinding wheel and other wearing parts must be replaced.

The SAND CLEANER 2.0 is already successfully installed at Daimler Mannheim and Fritz Winter Stadtallendorf.



Core made from reclaimed sand

<b>General Data:</b>	
<b>Reclamation rate: 80%</b>	
Input: 100% used greensand	Output: 80% Core sand and 20% valuable dust
Energy consumption: 36 kW/t core sand	
Total Operational cost: 15-30 €/t core sand	
<b>Savings:</b>	
New sand versus reclaimed sand: 15-30 €/t	
Dumping cost versus re-use: 20-50 €/t	
<b>Sandcleaner 2.0 can be used for all kinds of sand</b>	

For more information, testing possibilities or feasibility, contact: Huub van der Weiden





GEMCO Cast Metal Technology consists of GEMCO ENGINEERS and KNIGHT WENDLING GmbH, and counts for well over 40 years of worldwide experience in the foundry industry and offer dedicated foundry solutions for iron, steel, aluminum and all other castable metals. GEMCO Cast Metal technology operates from offices in The Netherlands, Germany, China, Mexico and Russia. A global network of over 220 foundry experts covers all foundry disciplines and provides a complete range of services from process- and feasibility studies, (concept-) engineering, design, and planning and project management of smaller as well as bigger projects up to overall contracting and turnkey realization of foundry projects. Further services encompass:

#### Engineering and Management of Foundry Projects

- Master-planning capital investments (greenfield / brownfield / modernizations)
- Operational and Financial Feasibility Analysis
- Energy and Logistic Simulations/Process Integration and Interface Engineering
- Risk Management and Project Control
- Contracting and Turnkey Deliveries

#### Dedicated Installations

- For improvement of Ergonomics
- For improvement of Safety and Environment
- For Efficiency improvements

Clients can be found among international key-players in the automotive and truck industry, mining, dredging, oil & gas, rail, heavy machinery, wind energy and many other business sectors.

The company's track record includes the realization of over 100 Greenfield and Brownfield foundries worldwide.

Current projects include new foundries and modernization projects in North America, Europe, Russia and China.

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