

## Going forward

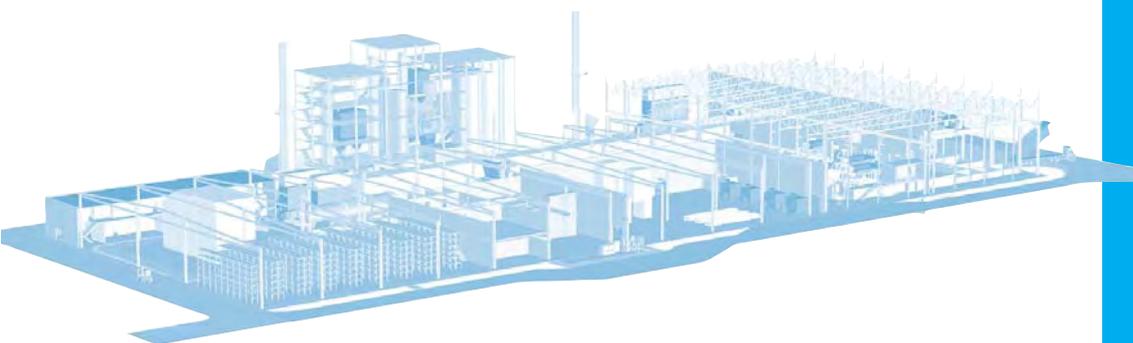
Our worldwide activities continuously encourage us to extend and improve our performances in cast metal technology. Numerous interesting projects allow us to further add experience in design, realisation and modernisation of foundry facilities. The arrival of new experts who reinforce our team translates into additional expertise, part of which encompasses the fields of aluminium and magnesium casting.

Further development is taking place in our consulting activities. While increasing consumer demand for top quality, high performance products instigates important progress in manufacturing technology, continuous shifts are taking place in global markets. Casting manufacturers find themselves in search of the most appropriate technology in the most appropriate location. Significant issues such as product costs, investments, low labour costs versus automation, availability of skills and raw materials, to just name a few, call for in-depth market analysis and strategic consideration. The dynamic global market holds as many prospects as it raises questions, in particular in relation to the casting manufacturers' current position in the various supply chains.

As an active participant in the global cast metal environment we believe to be in a position to support you fully on strategic or operational issues in your existing operations or with the realisation of new cast metal projects.

Ready when you are...

**Bas van Gemert**



### Also in this edition:

*CONSULTING, trends and strategies*  
*DaimlerChrysler / ATLANTIS FOUNDRIES, Expansion Project*  
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# New brake disc casting facility



The works for the new brake disc casting facility for BREMBO in Poland are well under way and the new plant is taking shape rapidly.

Close co-operation between the BREMBO and GEMCO teams enabled the first pour to be carried out successfully and the production ramp-up is proceeding as scheduled.

*Alberto Bombassei, President Brembo and Jan van Gemert, President Gemco*

*On the occasion of Mr. Bombassei's visit to the foundry, from left to right: Mr. Pasternak, Peter Withagen, Mr. Bombassei, Mr. Bologna and Mr. Sandrone*



*Brembo's new casting facility in Poland*



*Overview moulding line*

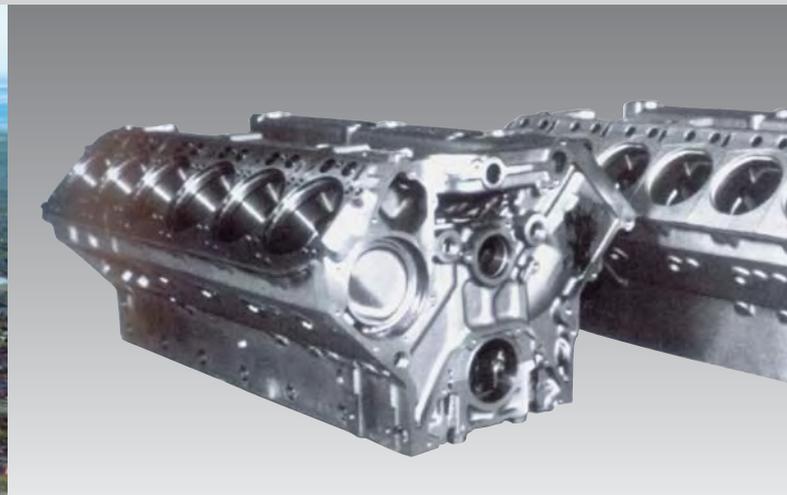
Atlantis Foundries (Pty) Ltd, being part of the DaimlerChrysler 'Mercedes Benz Trucks Unit', is incorporated into the Mannheim Foundry Product Unit. Atlantis Foundries is located in Atlantis, near Cape Town, South Africa. The product range comprises: cast grey iron cylinder blocks, machined commercial vehicle diesel engine cylinder blocks ranging from 4-12

cylinder variants and machined crankshafts used in commercial vehicle diesel engine applications.

In order to satisfy the sales forecast for the next years Atlantis Foundries is subject to an expansion project which is part of a wider ranging strategy of its parent company DaimlerChrysler AG that also encompasses the Mannheim



*ATLANTIS FOUNDRIES is situated approximately 50 km north of Cape Town at the southern tip of Africa.*



*From Atlantis Foundries product range. Atlantis moulds are formed to optimal specification.*



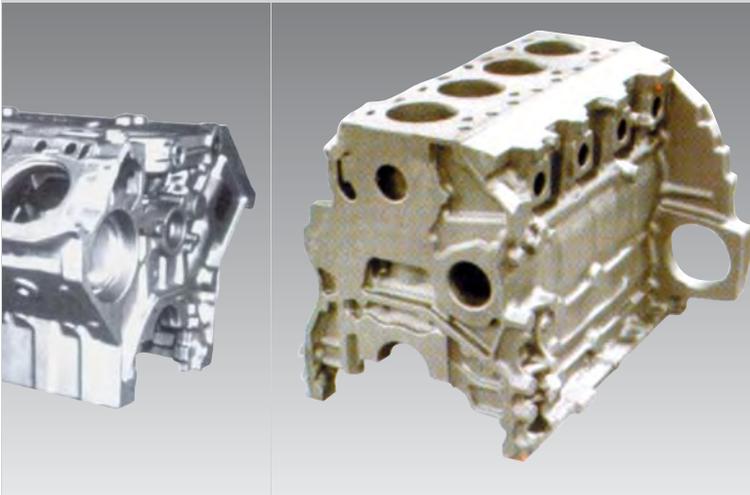
Pictures above: Views of the melting and pouring installation



Foundry. A new cylinder-block casting facility at Atlantis Foundries will allow the operation to double its capacity.

GEMCO carried out the concept engineering for this Expansion Project. Within this project, GEMCO has been awarded the Engineering and Project Management for the moulding- and core-shop including TURN-KEY supply of

the greensand and coresand plants as well as the automated core assembly and casting cooling facilities. The whole project will be realised in a live environment. Gemco's project team will work closely together with the Atlantis Foundries team, who will concentrate mainly on the internal organisation to maintain the present production during the reconstruction and the in time ramp-up of the new facility.



Photographs, courtesy of Atlantis Foundries

# TRENDS & STRATEGIES

The turbocharger market shows continuous dynamic growth. Since 2000 that market has grown by 50% mainly caused by a rising popularity of turbochargers in European diesel engine passenger cars. For new passenger cars, the combination of lower fuel consumption and the improvement in diesel engine construction allows diesels to achieve a higher market share over their gasoline-fuelled counterparts. Besides, new generations of diesel engines run more smoothly, are less noisy and more powerful than their predecessors and have significantly improved their image with the passenger car drivers.

The constantly growing popularity of diesel engines is continually increasing the size of the market. Forecasts for the next 5 years predict that the turbocharger market will double in volume (+100%) also due to an additional impact on gasoline turbocharger engine technology in response to the progress made in diesel engine technology. Stricter emission regulations for Europe, North America and Asia as well as engine downsizing for improved fuel consumption and emissions in gasoline engines will globally stimulate this dynamic growth. Whereas the turbocharger will eventually find more applications with gasoline engine technology the timing of this application is however still unclear. It is forecast that the global trend towards turbocharger equipped gasoline engines will persevere as the price of gasoline increases even sharper, in addition to stringent environmental standards. Engines will then

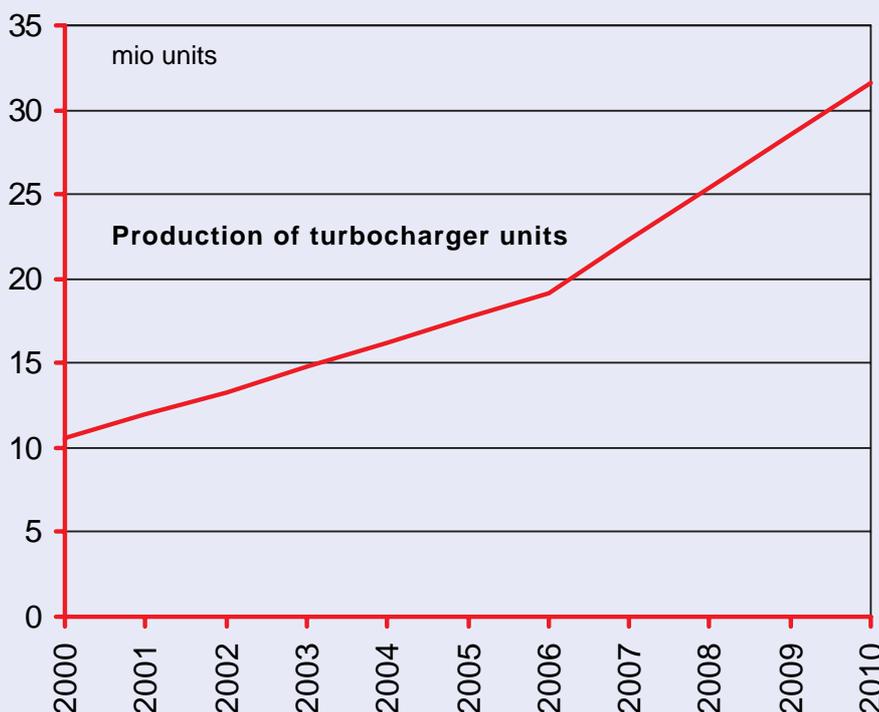
become smaller in order to save fuel and the turbocharger will be introduced to maintain high power outputs. Stricter emission demands will also motivate improved combustion processes at the substantially higher temperatures of approximately 1050° C. This, in turn, will drive the need for new material specifications for turbochargers.

## New developments in product design and materials offer business opportunities for innovative market players

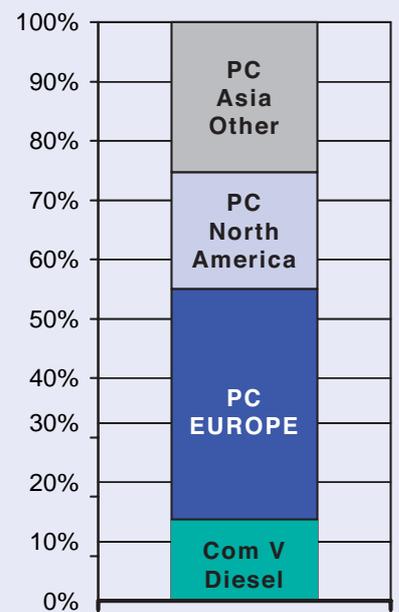
The turbocharger is essential for the performance characteristic of the engines used in the passenger cars. OEM market players aim to differentiate by means of the engine performance properties. Proactive, innovative suppliers have good chances for improvement of their market share.

Aiming at best engine performance characteristics, turbocharger manufacturers compete through innovative designs in order to meet OEM customers' individual requirements. The tendency towards more complex design consequently demands higher product accuracy. Fuel combustion and engine technology has lead to rising combustion and exhaust fume temperatures, from 600°C for diesel engines in the mid-80's up to more than 1050°C for the new FSI generation gasoline motors. Improved gasoline combustion processes might also lead to further increases in exhaust fume temperatures. As a result cast-

## Turbocharger Market Development



Forecast 2010 turbocharger market shares



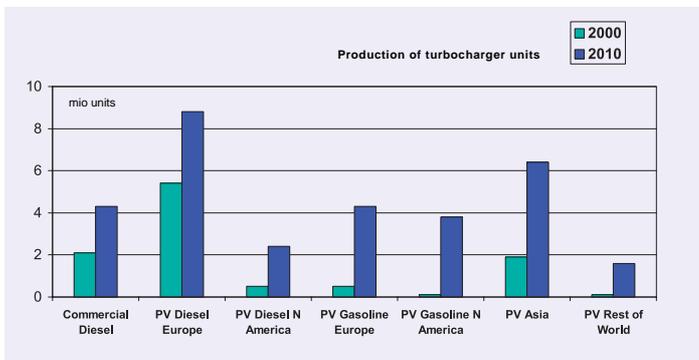
PC= Passenger cars

ing materials for these products have moved towards GJV SiMo and GJS NiSiCr (Ni-Resist) irons and even heat resistant steel for the most demanding applications. The selection of the casting material is an important factor as the housing is exposed to high exhaust temperatures and must maintain its exact shape and retain minimum dimensional tolerances to allow the turbine to work effectively at about 100,000 revolutions per minute.

Conventional diesel engines reach turbocharger exhaust temperatures of approx. 760°C. The standard casting material for turbocharger housings in these diesel engine applications is GGK (vermicular) cast iron. Nowadays, for regeneration purposes, the state of the art Diesel-Particle-Filter needs a higher temperature of approximately 860°C. Depending on the design of the housing, GGK cast iron may still be adequate to cope with this temperature, but, in

many cases, the material is changed to a SiMo quality.

The temperature of the exhaust fumes in gasoline engines is much higher than with Diesel engines, 960°C and up. Depending on the design of the housing SiMo might be sufficient, but in general, Ni-Resist casting materials are preferred. However, as the best combustion efficiency is achieved at exhaust temperatures of approx. 1050°C the casting suppliers with a long term view must be prepared to supply housings suitable for temperatures significantly above 1000°C. Under these circumstances Ni-Resist materials will not be sufficient and these high performance cast irons materials are likely to be replaced by heat resistant steel alloys.



*GEMCO/KNIGHT WENDLING: Interviews, Search & Research Cast Metal Markets, Trends & Strategies*



## IMPROVEMENT PROGRAMS

GEMCO's global activities also involve a number of foundry improvement programs. Experience reveals that the most efficient upgrading or optimization programs are best formulated on site in direct and close co-operation with the customer. An 'on site' approach offers opportunities to discuss various possibilities in shorter time periods allowing for more accurate investments estimations. Also, our experts that operate on location offer additional support and capacity to the customer's organisation, which often enables certain improvement measures to be implemented immediately. Subsequent and first hand feedback then allows for accurate evaluations on the spot.



## OPERATIONAL ASSISTANCE

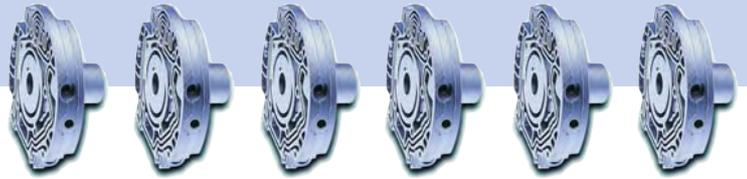
At present we have several experts at work in different aluminium and cast iron foundries. They offer various operational assistance to foundry departments like quality, engineering or maintenance. They assist in the realisation of foundries' usually smaller projects. For instance, for the optimisation or upgrading of the existing production, the reduction of scrap levels or other actions.

# Ideas for the future

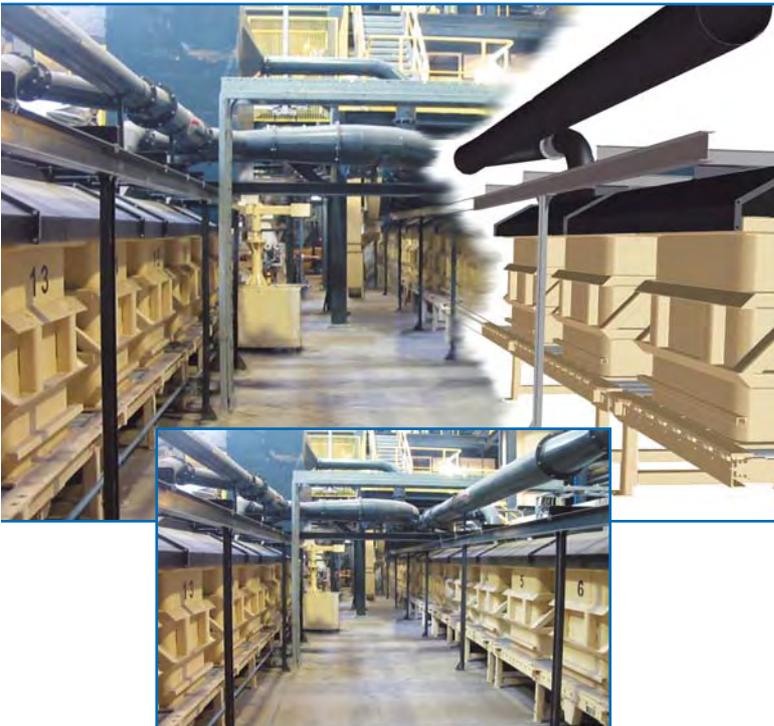
Close and accurate co-operation between GEMCO and HANDTMANN was the cornerstone for HANDTMANN's new lost foam plant in Biberach, Germany.

Clearly formulated requirements were followed by detailed engineering and design and the project realized within a well-defined project plan, on time and on budget.

Images shown are composed from photographs and 3D-projection, illustrating precision of engineering and design.



**handtmann**  
*Ideas for the future.*



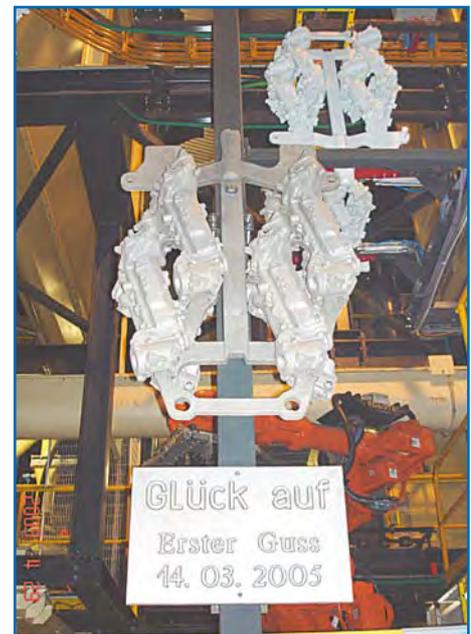
Roller-track  
Inset shows the actual realisation



Overview of the line and sand plant  
Inset shows the actual realisation



On the occasion of the hand-over of the commemorative plate at Handtmann. From left to right: Hans Flipse (Gemco), Jürgen Licht, managing director Handtmann, Johan van Gerven (Gemco) and Hubert Hagel, managing director Handtmann



'Erster Guss' on 14.03.2005

# University of Duisburg

Early in 2005, GEMCO received Prof. Dr.-Ing. H. -J. Wojtas with his students and assistants in Eindhoven. Prof. Wojtas is in charge of the independent department "Mould materials, Moulding processes and Product improvement" (FFP) within engineering sciences at the University of Duisburg-Essen, in Germany. The faculty at the University of Duisburg is a unique department worldwide.

At GEMCO the students were introduced to aspects of modern foundry design and the technology the company employs for the realisation of its projects such as modelling and simulation of foundry processes and logistics. The students also learned about the company's contribution to the industry regarding specific technology such as the lost foam process and the mechanical reclamation of moulding sand. The visit was completed with a guided tour at 'De GLOBE' foundry in Weert where the students could see a greensand regeneration system in operation. The team from 'DE GLOBE' had organised an excellent tour.

*Prof. Dr.-Ing. Wojtas and his team, before departure to GEMCO Eindhoven.  
On background: Thyssen Krupp Duisburg.*

# FFP

## FORMSTOFFTAGE 2006

There's a long-standing relation between the University and GEMCO who enrolls its new employees on the training courses at the University. The company also actively participates in the biennial FORMSTOFFTAGE; a two-day seminar entirely dedicated to Moulding materials by and for 'hands-on' foundry men. The event is highly appreciated throughout the industry.

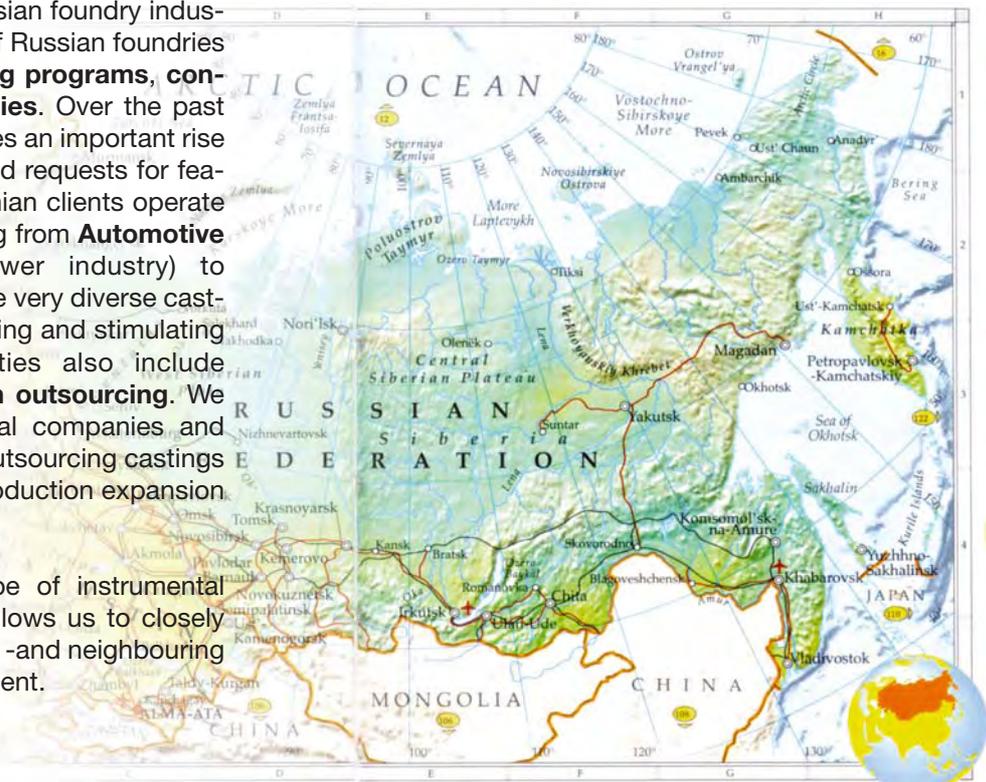
Prof. Wojtas is in charge of this event. The next edition of the 'FORMSTOFF-TAGE' will take place on 14 and 15 February 2006 in Duisburg. Information on the event, presentations and participations can be found on [www.formstofftage.de](http://www.formstofftage.de)



## From Russia, in brief:

Our intensifying involvement in the Russian foundry industry teaches us that a growing number of Russian foundries acknowledge the value of **restructuring programs, concept engineering** and **feasibility studies**. Over the past few months Gemco's Russian office sees an important rise in concept engineering assignments and requests for feasibility studies. Our Russian and Ukrainian clients operate in very different areas of activity ranging from **Automotive** to **Railway** to **Oil and Gas** (power industry) to **Agricultural**. Among them they produce very diverse castings and provide for creatively challenging and stimulating opportunities. In Russia our activities also include **research and analysis for production outsourcing**. We also carry out studies for international companies and foundry groups who seriously look to outsourcing castings production in Russia and Ukraine or production expansion possibilities.

Gemco's Moscow office proves to be of instrumental importance. Our presence in Russia allows us to closely participate in and contribute to Russia's -and neighbouring areas- progressive cast metal environment.





CastExpo '05 was held April 16-19, 2005 in St. Louis, MO, USA. It was the first time that the American Foundry Society (AFS) and the North American Die Casting Association (NADCA) teamed up to host a joint congress and exposition.

Overall attendance totalled 10.120 people from 44 different countries. 470 exhibitors occupied nearly 160.000 square feet of floor space making it the US' largest metalcasting event of the year. It was the first time GEMCO attended the show as an exhibitor. The many visitors we received made it a successful showing.



**Grosse Giessereitechnische  
Tagung 2005**

Also a first time for Germany, Austria and Switzerland who held a joint 'Giesserei Tagung' wich certainly proved to be a successful formula. The congress welcomed many well-known personalities from the industry. The yearly 'Grosse Giessereitechnische Tagung' offers foundry technicians and specialists the opportunity to meet and exchange experiences and technologies.

**Österreich - Schweiz - Deutschland  
Congress Innsbruck, Austria 04 -'05**



Innsbruck, 21-22 April 2005  
Picture from left to right: Klaus Schmitz-Cohnen, Lothar Spang and Bas van Gemert.

**June 22-27, 2005**

Moscow's Metallurgy Litmash has become one of Gemco's yearly appointments. A developing economy, increasing national as well as international interest from and for the Russian industry make the Russian Federation a challenging environment for the cast metal industry.



*We wish to thank all visitors to Gemco's stand at the various fairs and congresses for having made our participation worthwhile.*

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