

Traditional and innovative  
steel products from Witten on the river Ruhr





Since 210 years

*Tradition, progress and growth*



### Production and forward-looking development of high-grade steel products

The family-owned business Friedr. Lohmann GmbH, factory for special- & high-grade steels, is currently being run by its 6th and 7th generation and is still continuing to grow.

As manufacturers of high speed-, tool- and special steels (Herbede factory) as well as highly wear-resistant and heat-resistant cast parts (Annen factory), Friedr. Lohmann GmbH has attained international importance.

Today, the business has approximately 300 employees. Highly efficient plants, environmentally friendly methods of production and well-qualified, motivated specialists as well as a quality-management system in accordance with the EN ISO 9001 standards guarantee high quality-standard products as well as a steady process of development. The company policy, which is shaped through current investments and continuous improvements as well as renewal processes, secures an established future for the business.

Up-to-date facilities in all stages of processing guarantee reliability and flexibility. We combine the use of new design- and production engineering with over 200 years experience. Engineers, material-experts and application-advisors in dialogue with the consumers solve individual problems according to specific requirements.

For the past 45 years, Friedr. Lohmann GmbH has also concentrated on the manufacturing of high-grade steel casting. Nowadays, the main focus of production is on heat-resistant and highly wear-resistant steel casting.

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Quality and competence through over 210 years of experience





*A spectroscopic analyser replaced the chemical laboratory in 1970. Nowadays, analyses can be determined within seconds, using the simultaneously measuring optic vacuum-emission spectrometer, which was acquired by the company in 1998.*



*Johann Friedrich Lohmann*

## Foundation and Growth ▼

The company had high ambitions when it was established in 1790: Johann Friedrich Lohmann established his steel factory in Witten with the intention of competing with the market leading British steel. During the following 22 years, he and his son (see picture above) developed and refined a process for the manufacturing of crucible cast steel, which from 1812 was equal to its British prototype and unique all over Germany.

Due to the company's success, in the mid 19th century after only two changes of generation, the headquarters of „Haus Witten“ were no longer

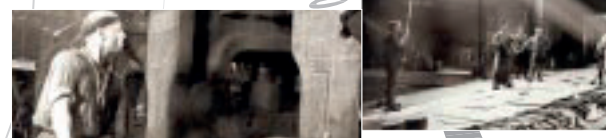
sufficient concerning the needs for expansion of the company. In the year of 1859, licences for the hammer- and rolling factory in Herbede on the Ruhr, the present-day headquarters, were obtained. The new location was chosen due to the proposed hydraulic power utilization from the neighbouring Ruhr.

During the course of industrialisation and the increased demand for material and quality associated with it, steel production was directed to the manufacturing of high-alloyed high-grade steel. With the improving quality of material and products, additional markets opened up and in subsequent decades, the capacity of forging steadily increased. In 1939, a modern crucible steel works was built at the location of Herbede and the melting works from „Haus Witten“ were transferred there.

In the mid '50s, form-cast manufacturing was integrated into the production, after electric furnaces had long since replaced the crucible furnaces and ingotting had developed in the area of melting.

In order to meet the rising demand, there was a need to create new capacities for the foundry. Therefore, a new site for this area of production was opened in Annen. Changes in the area of sheet metal manufacturing brought about by the ever-changing tool development and advancing conveyor belt production prompted Lohmann GmbH to renew its mechanical sheet metal processing in 1975.

*Nostalgia for old plants and powerful workers*





The sheet-rolling factory was improved in accordance with the new demands, with the production concentrating on the rolling of more highly alloyed tool-steels. The accumulation of this development caused the present-day success. For this reason, throughout Germany, Friedr. Lohmann GmbH is an outstanding, active hot rolling factory with the most modern facilities and finely ingenious, well-suited functions.

When making new acquisitions, Friedr. Lohmann GmbH always places importance on efficiency and technical innovation: The graphite rod furnaces were replaced by a 4-tonne-intermediate frequency furnace.

Single grinders for forged sheetsbars were replaced by one powerful Schlüter grinding machine and one shot blasting machine replaced the old generation of descaling aggregates. In 1984, the biggest single investment of roughly 4.9 million Euros was made with the purchase of the 10-MN-forging-press increasing the forging capacity for semi-finished bars as material for the sheet metal rolling factory and expanding the steel bar area by enabling bigger sizes. This brought unprecedented economic success. Investments in straight-flow furnaces and the use of automatic-acting production supports brought the rolling factory to the newest level of technology.

These days, Friedr. Lohmann GmbH presents itself as a progressive special-steel factory

with over 200 years experience of steel production and -development. The continuous adaptation to the international market needs has focused attention on the qualitatively first-class manufacturing of high speed steels, tool steels and special steels.

Thanks to the first-class quality of the heat-resistant steel casts for all types of charging devices in heat treatment installations as well as highly wear-resistant steel casts for

mechanical shovels and linings in e. g. shot-blasting machines, Friedr. Lohmann GmbH has now become one of the leading market players in Europe for these products.

Modern day process engineering within a traditional setting



2000

1990

1980

1970

1960

1950



## Special Steel Casting

### Pattern Making and Moulding Shop

In accordance with the job-specification, the forms necessary for the casting are prepared in the company-owned pattern carpentry or by an external service and are furnished according to the cast-technical requirements. For complicated parts of the form and shortest realisation, laser-supported rapid prototyping is used. The proto-

type drained according to this forms the basis of the following series-production. This accelerates the development and ensures the high-quality renewal-process of the high-quality functioning parts.

Thanks to the know-how from over 200 years of high-grade steel experience, all cast-technical aspects can be considered beforehand so that later, a fast and quiescent filling of the form can be guaranteed without piping.

owned hand-moulding-, machine-moulding-, automatic forming- and shell-moulding facilities. The weights of the pieces lie between 0.5 and 500 kg.

Due to the adherence to narrow measurement tolerances, high quality is guaranteed and this is especially shown in the well-defined contours and smooth surface finish. For the rounding off of the production an efficient core shop with different core-production-procedures is available.

In accordance with the lot sizes and individual requirements of the field of application, the cast parts are produced in the company-



*From the old days: flexible technology with manual assistance*



*Cores from the core shop ▲*



### Steel Bar-/Sheet Metal Production

#### Melting



The steel obtains the basis for the required physical and technological qualities during the melting in the steelworks. The comparatively small melting-aggregates allow a high flexibility, which offers Friedr. Lohmann GmbH the opportunity to develop special programs for specific requests. Moreover, induction furnaces have the advantage that the pre-determined analysis can be kept very precisely since only little evaporation and slagging of the alloy-metals takes place.

Pre-sorted scrap in high-grade steel, which is almost 100% recyclable, forms the basis of the load material; the fine-tuning of the melt-analysis takes place with ferrous alloys, highly available in alloy-metal, which are added in measured doses after the computer-assisted spectroscopic analysis.

#### Forging



At the forging press, ingots are formed into material that is used in the sheet metal-rolling factory and semi-finished products are deformed for the hammer factory or to steel bars as finished products in different measurements and qualities. The two smith forging hammers (15 and 30 hundredweights) supplement the measurement pallet in the smaller sized areas.

Through efficient rotational hearth-, bogie hearth- and insertion furnaces, the steel is set to the appropriate forging temperature beforehand. Commonly controlled annealing-processes guarantee optimal delivery-structure and best machinability.

#### Sheet rolling



For the manufacturing of high-grade steel sheet metals, Friedr. Lohmann GmbH always has a well-sorted warehouse for material with all current steel-goods available and is therefore able to deliver within a short space of time. The customer-specific sheet metal-formats are produced in the company-owned hot rolling mill, paying particular attention to the respective instructions of the customers. In order to guarantee the highest quality, all sheet metals are produced by cross rolling. The delivery-condition for the customer-specific repeat processing is achieved through an annealing-process in a controlled atmosphere as well as through a flattening process. A thickness-tolerance control per ultrasonic device as well as a surface-control of each piece of sheet metal is part of the process of quality assurance before

delivery to the customer.

Special formats of strips and circles as well as special forms of tools are available through subsequent shearing-, sawing- and laser cutting processes of the sheets.

#### Quality Assurance



The success of a business depends on its power of innovation, its productivity and the quality of services and goods that it provides. Quality assurance is an essential instrument of the sustainability of our competitiveness and it is decisive for our long-term market-success.

Friedr. Lohmann GmbH have an integrated quality-, environmental- and health and safety-management system, which has been

#### ESR Plant



With our own ESR plant, we have the capability of fulfilling the most demanding requests concerning the isotropy of the structure and the degree of purity of the respective qualities.

Established practices with the know-how of today



established in accordance with the relevant international standardised systems and is accredited to them. The system is oriented towards active, preventative action and aims for continuous improvement of quality and customer satisfaction.

Well-qualified, motivated specialists are guarantors for high quality-standard products as well as for a steady development-process. Output-specific production controls accompany the manufacturing process.

It is our main priority, building on long-term partnerships and the continual ascertainment of customer needs, to offer optimal solutions to problems, thereby improving our position in the marketplace.

## Services

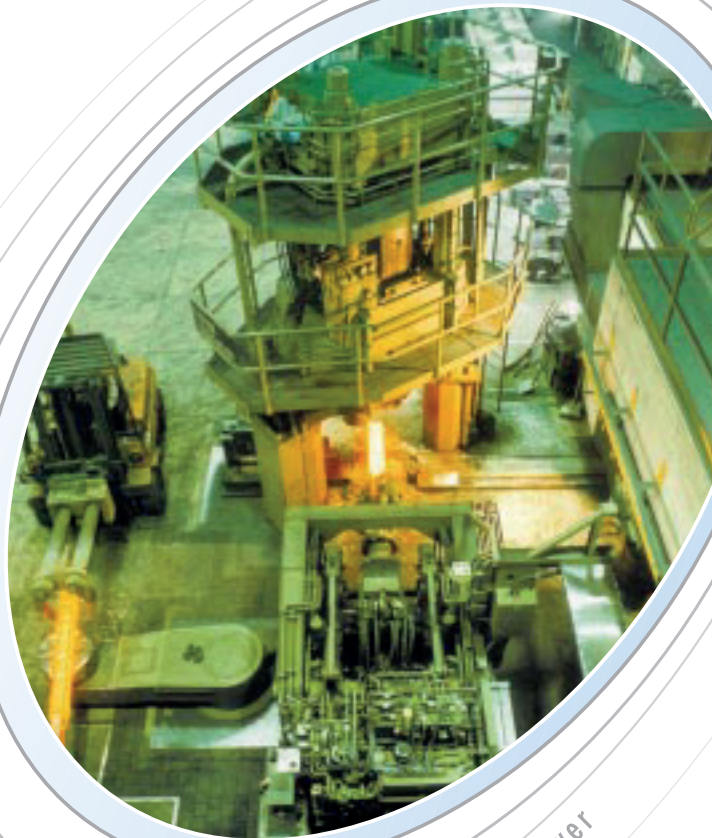


Continual optimisation and continuous development of our products:

Our specialists are happy to answer all questions on quality, forging, rolling and casting and are also available concerning solutions to problems. They ensure that the products we deliver are always of perfect quality and design. We carry out analyses and tests on our work-materials. Besides high speed-, cold work-, hot-work- and martensitic-corrosion-resistant steel, we also manufacture special steels according to your specifications and requirements.

Since the mid '90s, we have extended our range of delivery to include powder-metal-lurgical manufactured steels.

In addition, we are able to deliver semi-manufactured as well as ready-to-use products.

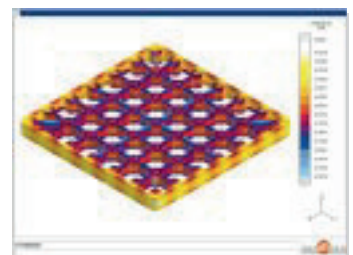


*The traditional art of forging with high-tech-power*

## Cast-technical Simulations

In cooperation with our highly specialised business partners and colleges, we are in the position to produce a cast-technical simulation. For the optimisation of the cast parts, a transparency of the casting process must be accomplished. On the

basis of form-filling, solidification, cooling, mechanical properties and thermal stress, the component is calculated and represented. On the strength of these calculations, the development times and costs can be reduced considerably.







Steel-production based on long term experience



Pure aluminium (99,9 % aluminium)



Fe-chromium (60 % chromium / 5 % carbon)



Fe-vanadium (50 % vanadium)



Fe-tungsten (80 % tungsten)



Fe-molybdenum (70 % molybdenum)



Fe-manganese (80 % manganese / 5 % carbon)



Fe-chromium (70 % chromium / 0,03 % carbon)



Fe-chromium (55 % chromium - 5 % silicon - 5 % carbon)



Fe-silicon (75 % silicon)



Co-metal (99,5 % cobalt)

### Alloys ▼

Besides carbon, which provides the alloy's hardness, the essential alloy-elements of the tool-steels are silicon, manganese, chromium, molybdenum, vanadium, tungsten and cobalt.

For the fine adjustment of the steel during the melting, they are readily available to the steel worker in highly enriched forms as ferrous alloys. They are alloyed with the steels in well-defined quantities in order to control qualities like the hardenability, wear-resistance, toughness, corrosion resistance, heat resistance and load durability.

In the area of heat-resistant cast products, the alloy-content is essentially an interplay of chromium and nickel to influence temperature durability, thermo shock resistance and durability against different furnace-atmospheres with sufficient mechanical load capacity.

*In previous years: products predominantly handmade*



*Also bulk articles and small parts can be charged with charging supports - in stackable baskets with heat-resistant wire mesh. ▼*



*Via optimum design the tensions in the nodal points of the grates are reduced. ▼*



*Centrifugal wheels and shovels are manufactured from highly wear-resistant special-steel castings and are normally delivered in individual parts.*

## Heat-resistant Special-Steels Castings

Undoubtedly, heat-resistant casting is one of the most important of Friedr. Lohmann GmbH products. It plays a special role in the form of charging frames as a link between the work piece to be treated and the furnace installation up to the straightening machine. Grates and charging supports of modular design principle are delivered according to standard measurements or individual customer requirements. Through an intensive dialogue between operators and the foundry, the most cost-effective ideal solution for the company can be developed by optimal adaptation of the charging frames to the usually fully automatic production process.

Conveyor chain strips can be supplied for areas of high and low temperature as ready components for continuous annealing furnaces. The single chain links are casted in accordance with the process engineering and the heat treatment products with breakouts, overlaps, webs, carriers or cambers according to customer specification.

The offer is completed with pre-finished driving- and deflector rollers as well as supporting rollers.



*Furnace-hinge-plate conveyors are available in widths between 300 and 2,000 mm. ▲*

## Abrasion-resistant Special-Steels Castings

In order to counteract the wear of components in shot-blasting machines, Friedr. Lohmann GmbH has developed a number of high-alloyed materials, which distinguish themselves as a result of their individual heat treatment through high wear-resistance. For example, mechanical shovels (see above), tundishes, bottom grate sprues and protecting plates in variable designs are made from these high-alloyed materials. An extensive stock usually guarantees a short time of delivery.



### Sheet- and Bar-products ▼

The performance of a tool under operational load is dependent on its constructive design, the manufacturing conditions, an optimal selection of material and a heat treatment appropriate for the material.

A satisfactory service life can only be expected if all these conditions are satisfied. The demand for optimal wear-resistance together with uppermost toughness and load durability is contradictory and therefore cannot be satisfied by a single tool steel.

To be consistent, the best selection of material for a given application in most cases calls for experience as well as specific expert-knowledge, which Friedr. Lohmann GmbH has acquired over the past two centuries. In most cases, this means the fathoming out of an optimal compromise.

The availability of specialists with technical knowledge and logistics expertise allows Friedr. Lohmann GmbH to offer benefits to its customers in terms of time, quality and costs.

### Sheet Metal Products:

In the area of rolling, cross-rolled sheet metals, strips and circles are available and can be delivered. Sheets metal are manufactured in thickness measurements measurements of approximately 0.8 mm to a maximum of 32.5 mm; strips and cuttings are sheared or sawn with company-owned installations to the narrowest tolerances. Circles are lasered in partner-plants and if requested, they are also equipped with centre- and/or additional holes.



### Steel Bar-products:

In order to guarantee shortest delivery time, we are keen to keep the respective steel goods, wherever possible, universally available in our warehouse. According to customers

requirements, steel bars can be delivered rough forged or premachined. The bar material can be sawed into discs of closest tolerances, for example. A well-equipped plant for sawing;

peeling- and turning operations is available for this. Semi-finished tools, such as forging-dies or hollow-drilled bars, can also be manufactured in cooperation with subcontractors.



Today: high-tech-plant for high production



Smoking chimneys were once a sign of a good economy

## Environment

Maintaining a sensitive environmental consciousness is part of the moral self-image of Friedr. Lohmann GmbH

In addition to our endeavour to maintain and improve the high quality of our steel-products, we also have an increasingly high commitment towards sustainable development through the technologies we employ. The necessary measures required for the certification of the environmental management system EN ISO 14001 have been carried out successfully.

This has ensured that Friedr. Lohmann GmbH has introduced and maintains an environmental management programme for the realisation of its environmentally orientated goals. Due to the changeover in parts of the production plants, from coal- and gas furnaces to the electric, natural gas- and protective gas applied furnace-installations with progressive burner- and regulating techniques as well as automatic control which are used nowadays, the emission thresholds required by law are not only met but are bettered.

Nowadays, to improve the wastewater situation, Friedr. Lohmann GmbH have extensive ducts with a rain storage reservoir and two rain clarification tanks at their disposal. Through the advantageous location of the company in free surroundings, the rainwater is fed back to the environment where it can continue its natural cycle.

Even in the middle of the 19th century, the utilisation of the hydraulic power at the Herbede plant was a desired regenerative source of energy for the powering of the first set of rolls in the sheet rolling factory. This direct powering was given up in 1992 with the changeover from an isolated operation to a network countershaft transmission. Today, a total of 4 turbines are operated by hydraulic power. This makes it possible to power the network around the clock. Altogether, approximately 4.5 million KWh are generated per year.

It is the company's aim to carefully design and continually improve its environmental protection and health and safety programmes with specific measures. The „operational employee suggestions for improvement scheme“ organized in 2002 also serves towards this purpose.



▲ Today, Friedr. Lohmann GmbH uses the hydraulic power installation on the river Ruhr, which was initially used to power a grain mill and then later served as a direct power source of production-aggregates, after a corresponding changeover and modernisation for the production of electricity.

Today, the economy goes hand in hand





### Apprenticeship ▼

Friedr. Lohmann GmbH promotes a new generation of workers of an industry sector with a promising future and offers industrial training in connection with the educational establishment Witten/Hattingen GmbH Retraining and professional practical training are also part of our apprenticeship possibilities.



Apprenticeship positions offered so far:

- Electronics Installer-technical plant,
- Industrial Mechanic-technical plant
- Process Mechanic-steel deformation,
- Foundry Mechanic-hand-form casting,
- Mechatronic Worker,
- Industrial Sales Representative,
- Information Technology Merchant.

### Tradition ▼

The records, facilities, objects and aggregates stored in the family- and company archive in the former grain mill with the building-section of the former Starman-yard, which has been attached in the meantime and is now referred to as 'shed', give evidence of the part played by the Lohmann family in the early industrialisation and the urbanistic development of Witten as well as the successes of the company's founder and his descendants in the area of steel manufacturing. Through this, the importance of the company relating to the economic history of Witten is acknowledged.

The continuity of the presence of the owner-families of our business in the management of the family GmbH as well as the commitment of employees, whose predecessors have already been active in our business, have created a distinctive business-culture.

### Regional Commitment ▼

As a business firmly rooted in Witten, Friedr. Lohmann GmbH sponsors clubs of a diverse range from the local community.



Over the past years, for example, the business has allowed PV-Triathlon Witten to use the company's premises for the staging of the annual international triathlon competition taking place in the Ruhr-valley of Herbede, involving an open for all triathlon - the Friedr. Lohmann special-steel public triathlon. This event receives a good reception year in year out.

with nature

Commitment as a sign of social responsibility



*Creative ideas for new solutions*



**Witten-Annen**



## Locations

### Headquarters

Friedr. Lohmann GmbH  
Werk für Spezial- & Edelstähle  
Ruhrtal 2  
D-58456 Witten-Herbede  
Phone +49 (0) 23 02 / 70 14 - 0  
Fax +49 (0) 23 02 / 70 14 - 189  
Email [stahl.info@lohmann-stahl.de](mailto:stahl.info@lohmann-stahl.de)

### Special-Steel Foundry

Friedr. Lohmann GmbH  
Werk für Spezial- & Edelstähle  
Brauckstr. 37  
D-58454 Witten-Annen  
Phone +49 (0) 23 02 / 89 06 - 0  
Fax +49 (0) 23 02 / 89 06 - 30  
Email [guss.info@lohmann-stahl.de](mailto:guss.info@lohmann-stahl.de)

### Internet

[www.lohmann-stahl.de](http://www.lohmann-stahl.de)

## Manufacturing programs

### Steel Bars/ Sheets

- Cold-Work Steels / Hot-Work Steels
- High Speed Steels
- Martensitic-Stainless-Steels
- Non-Standard Steels
- Powder-Metallurgy Steels

### Special Steel Castings

- Heat-Resistant Castings
- Abrasion-Resistant Castings
- raw, processed, as composite-construction

### Labour

- melting (ESR)
- forging, rolling
- machining

## Trading with Special Steel Products

### Warehouse

- sheets
- bars
- castings

### Services

- consultation
- construction incl. prototyping