INDUCTION DIVERSITY
Elotherm and IAS overview
The name SMS group stands for tailor-made metallurgical plants, machinery, and services. Applying innovative ideas and globally uniform standards, we join forces with our customers in the steel and NF metals industries to create all-new products – with pinpoint precision.

**COMBINED FORCES, WORLDWIDE EFFICIENCY**
SMS group is one of the leading global system suppliers of plants, machines and services along the entire metallurgical value chain. With a strong workforce of about 14,000 employees, we are able to present our customers with unique solutions, both technically and economically remarkable, to overcome any challenge.

In our complex world, safe and convenient infrastructures demand solutions in which steel, aluminum, and NF metals can demonstrate their wide range of applications.

**WE TRANSFORM ... THE WORLD OF METALS**
The plants, machines and services of SMS group provide its customers along the metallurgical process chain with outstanding solutions which help shape the global community.
SMS ELOTERM AND IAS
Your partners for induction heating solutions

With its developments and system solutions, Elotherm and IAS have set standards in induction technology for decades. The medium-sized internationally operating companies are part of the SMS group. As technology leaders, Elotherm and IAS combine all competences when it comes to induction.

- Induction heating of metals for forging, rolling and extruding
- Induction hardening and quench & temper
- Induction welding, annealing and special technology for tubes
- Continuous induction strip heating
- Induction kinetics
- Induction melting

CUSTOMIZED SYSTEMATIC SOLUTIONS
Elotherm’s and IAS’ technology is based on compatible modular plant components, which can be efficiently combined into individual configurations. This enables economic industrial heating solutions – irrespective of whether it is a single unit or a complete manufacturing line.
ADVANTAGE INDUCTION
Clean, energy-efficient technology

Heating, melting and holding of metals, hardening and tempering, welding and annealing or electromagnetic stirring systems - Elotherm and IAS are the market leader with innovative, clean and energy efficient induction technology. In efficient modular designs custom induction systems are developed. Confidence the long-standing united competencies.

The benefits of induction heating include:
- High power densities
- High heating rates
- High electrical and thermal efficiencies
- Local power induction at selected points
- Eco-friendly heating without CO₂ emission
- Excellent process control

Applications for induction technology
- Heating for the purpose of forming by forging or rolling
- Heat treatment such as hardening or annealing
- Joining such as welding or soldering

PRINCIPLES OF INDUCTION

Induction heating falls within the category of direct electrothermal processes, i.e. the heat is generated directly inside the material.

In electrical engineering this principle is known as induction.

Electrical voltage is induced in the electrically-conductive object under the influence of a magnetic alternating field, and an electrical current is produced. This eddy current flows opposite to the original current.

This causes Joule heating of the object.
CORE COMPETENCES
All your benefits at a glance

TECHNOLOGY LEADER WITH OUTSTANDING PROCESS COMPETENCE
- Innovative system partner for the automotive and supplier industry as well as the steel, rolling mill and pipe production industry for more than 75 years
- More than 6000 plants worldwide in continuous operation for decades
- Sales and service around the globe
- Fast delivery by local manufacturing and stockkeeping facilities

INDIVIDUAL CUSTOMER CONFIGURATIONS
- High efficiency thanks to modularized plant components
- Tailor-made manufacturing solutions

ENERGY-EFFICIENT, ECONOMIC INDUCTION
- Minimized energy consumption through intelligent technologies
- Sustainable and eco-friendly due to reduction of CO₂
- Quick change of production and increased productivity
- Low manufacturing costs
- Integrated effective power measurement for efficient quality control

IN-HOUSE INDUCTOR AND CONVERTER MANUFACTURING
- All competences under one roof
- Optimal technical interfaces to existing customer systems
- Individual design and layout to attain optimum results
- Innovative converter development with low and resource-saving energy demand

PRECISION IN PROCESSING
- All relevant certificates, e.g. VDA, DIN/ISO
- Continuous project and quality management from the initial enquiry through field service
CLEAN, ENERGY-EFFICIENT INDUCTION TECHNOLOGY
During induction heating the metallic workpiece is exposed to an electromagnetic alternating field by means of a current-carrying coil. Consequently, eddy currents are generated in a non-contact manner and heat is resulting. This process can be specifically influenced. Depending on the current penetration, temperature and cooling rate by the quenching process the microstructural properties of carbonaceous metals can be adjusted with the induction technology. In this way, precise hardening can be performed according to customer requirements.

TAILORED EFFICIENTLY WITH ModuLine
With ModuLine, Elotherm offers two modular hardening plant series: EloCrank and EloFlex. Owing to this modular system, cost-effective tailormade and suitably dimensioned hardening systems can be realized. With the so-called configurator developed by Elotherm a system is selected from individual modules fulfilling all customer requirements. In this case, the EloCrank series have been designed for hardening of crankshafts and EloFlex for steering, axle and gear components and many other workpieces.

REDUCING ADDITIONAL COSTS
Another savings potential results from the integrated effective power measurement in the hardening machines of Elotherm which allow for a complete quality control of the hardened workpieces. Complex examinations for example on cut bearing segments can thus be dispensed with.
In engine construction, the crankshaft is a key component. New demands posed by lightweight automotive construction and a higher effectiveness of motor technology ask for precision within ever closer tolerances. In addition, the crankshafts must have combined material properties: highly accurate hardened surfaces for wear-free and long-lasting running properties and an elasticity of the component body for high torque take-up.

Elotherm System Solutions for Surface Hardening of Crankshafts:

**EloCrank**
- Mass production of car crankshafts
- Workpiece length up to 650 mm
- Single station
- Double station

**EloCrank L**
- Flexible production of crankshafts
- Workpiece length up to 1500 mm
- Cars
- Trucks and other large vehicles
- Stationary systems

**EloCrank XL**
- Production of large crankshafts
- Workpiece length up to 12000 mm
- Marine crankshafts
- Large Diesel engines
- Generators
- Compressors
- Pumps
STEERING, AXLE AND GEAR COMPONENTS
Made to be tough, precise in handling

Surviving potholes and bumps without damage and always providing a feeling of direct control. For axle and steering components this means: to withstand highest everyday stresses with robustness on the one hand, and to convey sensitivity for the road and for vehicle dynamics to the driver by highly precise mechanical properties on the other hand. The only solution to overcome this contradiction is modern and hardened vehicle components.

Your machining Task:

SURFACE HARDENING OF STEERING, AXLE AND GEAR BOX COMPONENTS
- Tripod stems
- Tripod tulips
- Joint parts
- Steering knuckles
- Axle carriers
- Axle shafts
- Axle journals
- Starter shafts
- Drive shafts
- Chain links
- Machine cutting tools
- Tools

Elotherm System Solutions for Surface Hardening of Steering, Axle and Gear box components:
- EloFlex
- Single station
- Double station
- Flexible production
- Manual mode
- Fully automatic mode
- EloFlex Inline
- Fully automatic through feed mode
- Up to three heating stations
The key requirements for camshafts, axles, shafts and other long cylindrical parts can be summarized in one sentence: weight saving, improved vibration behavior, increase in useful load and thus reduction of fuel consumption as well as durability of the components.

Section of induction hardened toothed section of a rack
For Maximum Customer Satisfaction

Whether in aggressive salt water environments on the open sea or in the dusty environment of mining – rings have to withstand extreme conditions. It is crucial that the components in offshore wind turbines or large mining machines function reliably and practically maintenance-free, despite the high dynamic loads. The process for creating the necessary wear-resistant surfaces is induction hardening.

Selective Microstructure Modifications

The defined induction heating and quenching with the coolant selectively modifies the microstructure of the steel – the material becomes hard. This physical effect is used for both teeth and raceways.

The solutions from SMS Elotherm induce exactly the amount of energy required for these processes. Systems such as the patented effective power measurement per workpiece or the sensor-aided position correction of the induction tool enhance the efficiency and precision of the hardening process and ensure a consistently high, reproducible quality of the workpieces.

Intelligent Machine Concepts

SMS Elotherm offers the optimum machine concept, depending on the ring type and size:

- EloRing Flexible for the hardening of gear rings
- EloRing Horizontal for the hardening of large gear wheels
- EloRing Vertical and EloRing Tilt for the hardening of large roller bearings
- EloRing Seamless for the scan hardening of raceways on large rings
ELOOTHERM ForgeLine
Induction Heating: Forge

WITH ForgeLine FOR AN ECONOMIC SOLUTION
For forges, Elotherm has developed the ForgeLine furnace series, offering a suitable machine for essentially any product and capacity. All furnaces feature a modular architecture, which can be quickly and efficiently configured to meet individual requirements.

RAPID AND PRECISE HEATING
When applying the induction heating method, a metal workpiece body is exposed to an electromagnetic field in a non-contact manner by means of a coil. As a result, eddy currents are generated in the material which produce heat, i.e. directly in the workpiece itself. Therefore, the workpiece heating is not limited to heat transfer as in a conventional furnace. Consequently, induction heating times are very short and the temperature can be set precisely.

RISE IN QUALITY, REDUCTION OF COSTS
In modern forges, induction heating plants are standard equipment for billet and bar heating. Because induction furnaces have a proven record of reducing the manufacturing costs and improving the quality of forged products, they largely replace conventional furnaces. Elotherm is the market leader in the sector of induction heating plants for forges.

The company has contributed considerably to the progress in technical development and particularly in energy efficiency, and with its latest innovations such as iZone, it is one of the technology leaders.
COST-REDUCING AND CLIMATE-FRIENDLY
iZone is a proven Elotherm technology for increasing plant efficiency and lowering manufacturing unit costs – particularly with respect to partial throughputs. In addition, natural resources are conserved and the carbon footprint is reduced by the energy efficiency of iZone.

INTELLIGENT EXPERT SYSTEM
The core element of iZone is a database-supported expert system. On the basis of the material and machine data entered, the iZone control system automatically calculates the process parameters online to generate the optimal heating curve. The maximum possible process stability and energy efficiency are therefore assured.

FUTURE-PROOF EQUIPMENT, ECONOMIC MODERNIZATION
The ForgeLine series can benefit from iZone technology, offering plant operators immediate cost savings. Real-world customer data demonstrate that replacing older energy-inefficient plants with new iZone plant provides a short return on investment.

KEY FEATURES
- High energy efficiency through zone control
- Controlling the heating with expert systems
- Converter technology with uniformly high power factors cos phi > 0.95
- Flexibly and exactly adapted heating processes
- Automatically calculated machine data
- Optimal heating curve
- Short return on investment for modernization and equipment
HIGH-TECH HEATING
EloForge meets your needs

EloForge heaters fulfill all expectations of the plant operators with regard to high productivity, stable heating processes and highest product quality for forging processes.

Your machining Task:

**INDUCTION BILLET AND BAR HEATING**
- Billet Heating
- Slab Heating
- Bar Heating
- Single Part Heating
- Bar end heating
- Special material

**Elotherm System Solutions for Induction Heating:**

**EloForge**
- Billets from 20–240mm diameter
- iZone -Technology
- Billet feeding systems
- Extraction systems
- Emptying devices

**EloBar**
- Bar material from 18–360mm diameter
- iZone -Technology
- Extraction systems
- Emptying devices
- Bar magazine

**EloForge Individual**
- Single part heating
- Bar end heating
- Bars, tubes, profiles
- Thixoforming
ELOOTHERM LongLine
Induction Solutions: Tube plants

INDUCTION SOLUTIONS FOR ALL TUBES
For modern tube production, the induction heating and welding technology is a precondition to high productivity, quality and profitability. In the field of tube plants, Elotherm has many years of experience combined with latest process know-how. Based on this, Elotherm develops and provides solutions all along the entire tube manufacturing chain, i.e. perfectly integrable and in a cost-efficient manner.

INTEGRATED OFFER
Elotherm combines all competences of the induction technology under one roof and thus offers its customers tailor-made, integrated services from one source with a responsible contact person.

The spectrum of services ranges from giving advice via engineering, plant construction up to commissioning, training courses and comprehensive customer care.

SOLUTIONS FROM A SINGLE SOURCE
Together with our sister companies of the SMS group, we offer our customers integrated solutions for the whole process chain.
ADVANCEMENT
All along the line

ALL COMPETENCES COMBINED
High frequency welding equipment for longitudinally welded tubes and heating plants for seamless tubes of different steel alloys, stainless steels and NF metals.

One of the biggest advantages for the customer is the overall competence of Elotherm for stable processes harmonized with each other.

ECO-FRIENDLY TECHNOLOGY
In general, induction heating and welding is a clean process. Compared to furnaces operated with fossil fuels, no polluting emissions are generated when the induction technology is applied.

HIGHEST ENERGY EFFICIENCY
Elotherm has improved the heating process continuously and has implemented it in a highly efficient way. Heat is generated directly in the workpiece, whereby the heating time of the tubes is reduced. Induction systems can be immediately adapted to product changes, for example for diameter or wall thickness changes. With new converter technologies, the induction systems of Elotherm require less energy than comparable facilities.
ALL AROUND TUBES
System solutions by Elotherm

INDUCTION WELDING
WITH EloWeld
- Tubes and Profiles from 6 – 600 mm outer diameter
- 0.12 – 25.4 mm wall thickness
- Rate of production more than 200 m/min
- Converters with parallel or series oscillating circuits
- Variable frequency range
- Operator friendly control
- Modular build, easy to maintain concept

INDUCTION SEAM ANNEALING
WITH EloSeam
- Longitudinally welded tubes from 25 – 600 mm outer diameter
- Up to 25 mm wall thickness
- Automatic welded seam tracking
- Exact power input
- Water cooled inductors with concentrator plates
- IGBT converters from 500 to 3500 kW

TUBE HEATING AND COATING
WITH EloTube
- Tube diameters from 25 – 1500 mm
- Wall thickness up to 30 mm
- Black annealing
- Bright annealing
- Coating

INDUCTION SOLID-WALL PIPE ANNEALING
Welded seam and solid-wall pipe annealing with EloSeam combined with EloTube.
- Adjustable for tempering, normalizing, stress-free and full body annealing
- Combined converters

SPECIAL INDUCTION APPLICATIONS
- Tube Bending
- Tube end heating
- Pipe bends
NEW POSSIBILITIES
Due to their technical advantages, the electromagnetic stirring techniques and the induction heating technologies of Elotherm are more and more frequently integrated into the process chains for metal production – particularly for the production of steel and stainless steel. With these technologies, manufacturing steps can be carried out more efficiently, more productive and more eco-friendly. In addition to that, the induction method with precisely adjustable process parameters provides highest productivity.

The portfolio of Elotherm in the area of metallurgical induction solutions ranges from the liquid phase up to treating strips. One of the greatest benefits for the customer is the overall expertise of Elotherm for stable processes harmonized with each other.

SOLUTIONS FROM A SINGLE SOURCE
Together with our sister companies of the SMS group, we offer our customers integrated solutions for the whole process chain.

EloKinetic
Electromagnetic systems in continuous casting plants
- Mold stirrers
- Electromagnetic brakes
- Damping systems for strip caster

EloHeat
Induction heating systems in hot and cold rolling mills
- EloHeat Flat – Flat Modular system for all rolling mill types
- EloHeat Long – Induction provides high cost efficiency
- Boosters for strip heating
- Strip edge heating

EloStrip
Induction heating systems in strip processing lines
- Lead patenting
- Blue annealing
- Lacquer drying
- Heat treatment
- Heating for tin-plating
- Heating for galvanizing
The basic idea of a minimill is the production and processing of steel for long and flat products in an integrated factory. The hot billets or hot strip from the caster are fed through an induction heating system directly into the rolling mill.

The induction system detects the material’s incoming temperature and equalizes the surface and core temperatures on demand, in order to provide an optimum rolling temperature. This setup allows for significant energy and cost savings and causes less emission.

INDUCTION HEATING IN CSP® FLEX OR USP® PLANTS
Induction solutions by Elothermincrease productivity in hot rolling mills, improve the material’s surface quality, minimize the roller’s forces as well as provide the heat for homogenization of the material’s microstructure. Additionally, thinner strip qualities can be rolled.

Downstream of the roller hearth furnace, the induction heating system is capable to increase the slab temperature up to 200°C and to flexibly control the entry temperature into the rolling process to an optimal level. This ensures that specific processes such as thin-strip rolling can also be performed on the CSP® flex line.

INDUCTION HEATING IN BETWEEN STANDS
Here, induction heating provides an innovative technology for the production of micro-alloyed steel grades of the API quality. Induction heating creates an even temperature level between the first mill stands so that a higher relative thickness reduction is reached. Owing to a high temperature level, correspondingly higher forming degrees can be achieved and thin strips can be rolled in endless mode.
A key feature of CMT technology (Continuous Mill Technology) is the replacement of the conventional gas- or oil-fired furnace with an induction plant positioned directly inline between the continuous caster and rolling line. Here the heat stored in the billet from the casting process is used for the direct rolling process, and the temperature is merely equalised over the length and cross-section and adapted to the optimum rolling temperature.

Overall, therefore, far less energy is consumed here, compared to the traditional method, than would be the case if the entire billet had to be re-heated from room temperature or any other intermediate temperature to the optimum rolling temperature at the inlet section of the first roll stand.

The major benefits of this innovative minimill configuration with integrated induction technology above all include:

- Lower investment costs
- Lower operating costs

The lower investment costs are primarily achieved by dispensing with a conventional combustion furnace and reducing the logistics associated with billet production, e.g. storage facilities or crane tracks, as well as the reduced requirements with regard to space and accordingly to warehouse stock.

The reduced operating costs can mainly be attributed to the energy savings from lower primary energy costs and higher output. Traditional minimills featuring conventional furnace technology for reheating billets use either natural gas or heavy oil as fuel.

By using induction technology instead of conventional combustion furnaces, direct emissions of CO₂, NOₓ and SOₓ when heating the billets before the rolling process are completely eliminated in a CMT minimill.

As the thermal conditions at the rolling mill entry are being stabilised, the temperature over the cross-sectional area of the material is homogenised.

Billets with a homogeneous temperature distribution can be more easily formed and therefore ensure a stable rolling process. Since less rolling force is required for forming billets with higher absolute and relative heat, there is also less roll wear and the rolls last longer.
RISE IN QUALITY, REDUCTION OF COSTS
In modern production lines the Q & T plants of Elotherm are the standard facilities for quenching and tempering of tubes and bars.

In the field of induction quenching and tempering, Elotherm is the market leader and combines the entire expert know-how from the induction hardening and heating technology for long products.

QUENCH & TEMPER FOR TUBES
The induction plants of Elotherm for quenching and tempering of tubes consist of an induction heating section with subsequent quenching facility followed by a tempering section for the setting of the desired hardening parameters. The quench & temper lines of Elotherm are above all convincing by their high efficiency, precision and flexibility compared to conventional gas- or oil-fired furnaces.

QUENCH & TEMPER FOR BAR STEEL
The quench & temper lines for long products such as bar steel likewise provide an induction heating section, a cooling section and downstream tempering induction coils. Heating and tempering coils are subdivided into several controllable zones. This has the advantage that each final zone is usable for homogenizing, austenitizing, solution annealing (stainless steels) or for hardness adjustment.

SUBUNITS OF A QUENCH & TEMPER LINE
Arranged from left to right:
- Loading station
- Induction heating, austenitizing
- Quenching station
- Tempering and holding section
- Cooling bed
IAS ExtruLine
Induction solutions: Metal Forming

MAKING EXTRUSION PROCESSES MORE PRODUCTIVE
The TEM-PRO Heater® is a temperature profile heating system. It enables precise temperature control during extrusion and thus ensures a flawless manufacturing process with isothermal extrusion. Due to the higher power density that can be transferred, the TEM-PRO Heater® is far more effective, especially with large billet sizes, compared to a gas furnace. Another of its features is that overheating of the billet surface is prevented. Depending on the input stock, the TEM-PRO Heater® can achieve excellent efficiency levels of up to 75 percent.

MATCHING THE MATERIALS
Its modular design, intelligent, computer-aided temperature profile adjustment system as well as the ability to adjust power levels and heating individually mean the TEM-PRO Heater® can be used for a variety of materials:
- Aluminium alloys
- Copper alloys
- Steel and iron alloys
- Special alloys such as titanium, zirconium and molybdenum
- Precious metals
CONTINUOUS INLINE PRODUCTION
With the patented inline heating system the log is first heated in the gas furnace. It then reaches the desired final temperature in the multi-zone induction furnace, whereby the exact temperature profile of the billet that is still to be separated is taken into consideration. The concept is based on the TEM-PRO Heater® technology from IAS. The log is then cut to the required length using a saw or shear unit before the extrusion process starts.

INDUCTION PLUS GAS HEATING
With complex special steels the extrusion temperature must be kept within a very narrow range. To ensure this is the case, IAS has developed clever combinations of gas heating and induction furnace systems with high efficiency levels, with the result that the benefits of both types of heating, appropriately matched with the product range and extrusion technology, can really be felt.

C.O.P. – AN INNOVATION IN TEMPERATURE MEASUREMENT
With the C.O.P. Cartridge (Container Overheat Prevention) IAS is proud to offer a heating cartridge solution with considerably improved overheating protection. This innovation is the answer to the critical problem of overheating at the heating rod bore. Existing resistance heating systems can be easily retrofitted with C.O.P. Cartridges – with no modifications to the container required.
IAS MetalLine
Induction solutions: Foundry

IDEAL FOR COPPER MATERIALS
MetalLine channel-type induction furnaces from IAS are characterized by their high thermal efficiency with low energy consumption. They provide smooth molten metal mixing for homogeneous alloys with a constant, uniform temperature.

WIDE RANGE OF APPLICATIONS
MetalLine channel-type induction furnaces can be used for melting scrap and large-size melting stock as well as for storing and maintaining the temperature of various alloys, and can also be used as heatable casting furnaces.

HOMOGENEOUS MELTING
The electromagnetic forces generated in MetalLine coreless-type induction furnaces cause intense movement in the molten metal bath due to the technology used. The result is perfect homogenisation of the melt and degassing of oversaturated melts. The bath movement also facilitates rapid alloying that takes varying process requirements into account.

HIGH METAL YIELD
With a metal yield of around 98 percent MetalLine coreless-type induction furnaces are the preferred solution in the field of ferrous and non-ferrous metals for melting swarf. The furnaces attain their high level of productivity thanks to the desired movement of the molten metal bath and the high power density installed. IAS offers coreless-type furnace plants with capacities ranging between 10 kg and 30,000 kg.

ECOPLANTS
The sustainability concept that puts the customer’s interests first. With it we are recognising the fact that sustainability has become an important factor for our customers – for economic and ecological reasons. Economic, because savings in energy and raw materials reduce costs; ecological because the conservation of resources is becoming ever more important. Ecoplants solutions do both.
CONVERTERS AND INDUCTORS
Knowing what is important

COMPETENCE FOR MORE PROFITABILITY
Converter, oscillating circuit, inductor – together they are the heart of each induction plant. These factors mainly determine the process reliability and the economy for the customer. Therefore, Elotherm has brought together all key components under one roof – from in-house development to in-plant manufacture.

OPEN FOR THE FUTURE
Modular design and standardizations of the ELOMAT converters make sure that efficiency, durability and serviceability are achieved. For any application, the ELOMAT converters for LLC, series and parallel oscillating circuits provide an optimum power source. Frequencies of up to 600 kHz and an output of 4500 kHz for each converter unit are realized by modern transistor circuits. ELOMAT converters stand out thanks to their modern digital control and a user-friendly operating concept. Very flexible interfaces enable a harmonic integration into process control systems and higher-level plant controls.

PERFECT WORKPIECE ADAPTATION
Inductors of Elotherm are combining highest precision and high efficiency with process reliability. As interface between machine and workpiece, surrounding round, shape or line inductors are used. Calculation and simulation programs developed by Elotherm ensure application-specific implementations and proper dimensioning and thus a high level of process quality.

- Converters and inductors of our own manufacture
- Durable, easy-to-service components
- Future-oriented continuous development through our own research
SERVICE
For maximum customer satisfaction

CUSTOMER-ORIENTED ORGANIZATION
For the service area, Elotherm and IAS have created an organizational structure which optimally supports the customers. In addition, Elotherm and IAS provides a worldwide service network which is continuously further extended. Current locations are in Germany, Brazil, China, France, India, Mexico and North America. The result for the customers: highest availability and shortest reaction times.

SERVICE FROM PLANT MANUFACTURER
The service customers of Elotherm and IAS benefit from an in-depth know-how of the plant manufacturer. The advantages:
- Rise in productivity
- Increase in plant availability
- Improvement in product quality
- Reduction in operational costs
- Safeguarding of plant value
- New fields of application for older facilities

ALL-INCLUSIVE SERVICE OFFERING
Depending on customer needs, Elotherm and IAS provides appropriate services. Similar to the actual plants, the customer can economically use individual or several harmonized modules.
- Assembly and commissioning
- Production assistance
- OEM spare parts service
- Maintenance and repairs, including third-party equipment
- Overhaul of Machinery
- Innovation of Assistance
- Process Assistance
- Conversion and Modernization
- Control System Upgrade
- Training courses
- Service hotline
- Power- and processoptimizing
- Energy efficiency assistance
- Converter service
- Inductor service
- Consignment stores
The information provided in this brochure contains a general description of the performance characteristics of the products concerned. The actual products may not always have these characteristics as described and, in particular, these may change as a result of further developments of the products. The provision of this information is not intended to have and will not have legal effect. An obligation to deliver products having particular characteristics shall only exist if expressly agreed in the terms of the contract.