

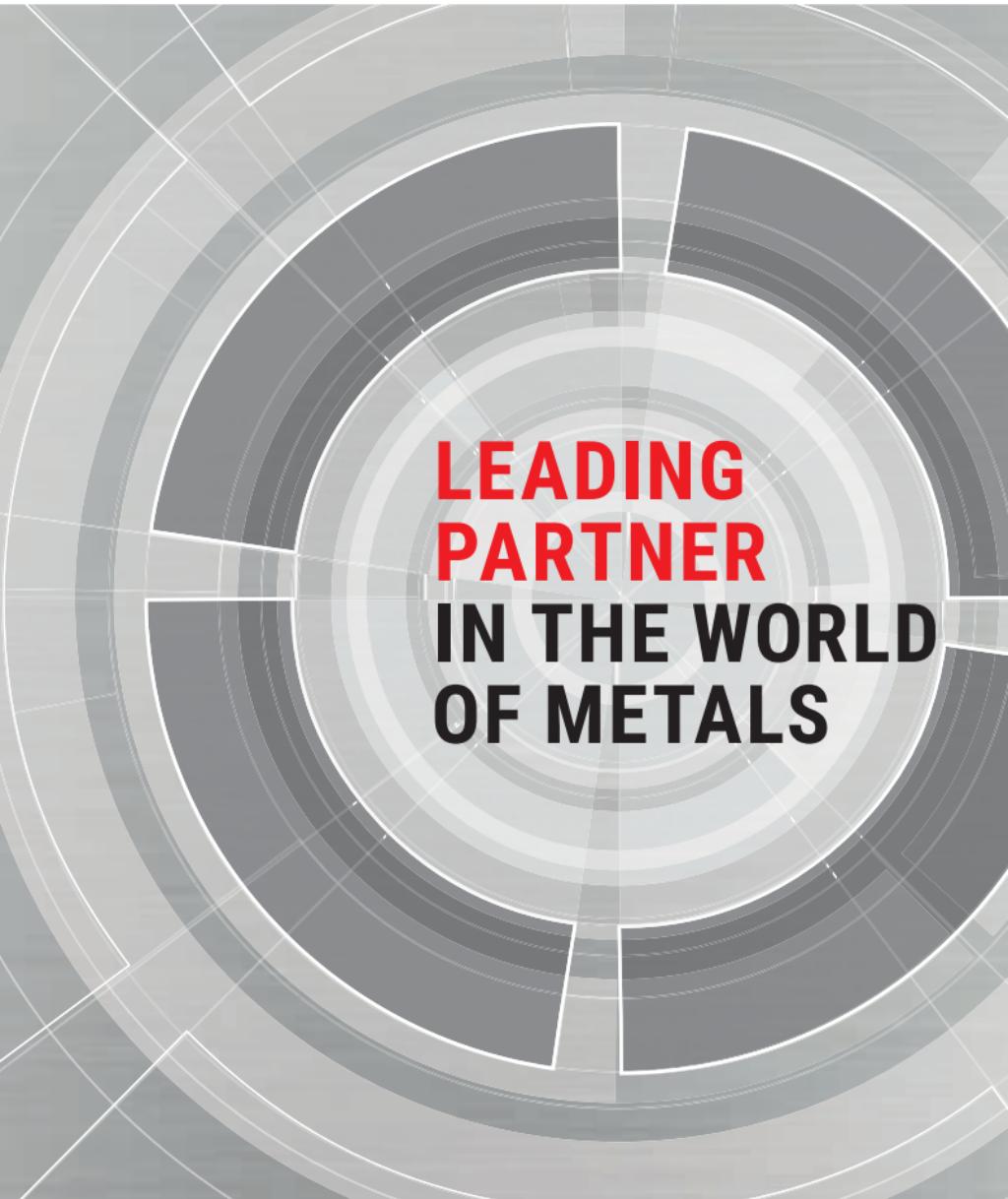


Leading Partner in the World of Metals

SMS group at a glance



Combined Forces, Worldwide Efficiency SMS group at a Glance



**LEADING
PARTNER
IN THE WORLD
OF METALS**

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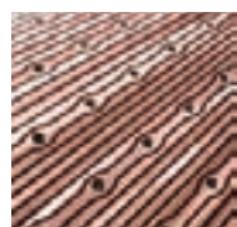
Building Bridges for Metallurgical Developments Plants, Machines and Services from a Single Source



Integrated Concepts for the Production of Steel, Aluminum and Copper

The SMS group is one of the leading global system suppliers of plants, machines and services along the entire metallurgical value chain.

With a 14,000 strong workforce, we are able to present our customers with unique solutions, both technically and economically remarkable, to overcome any challenge and as an innovation-driven company, we remain fascinated by new ideas.



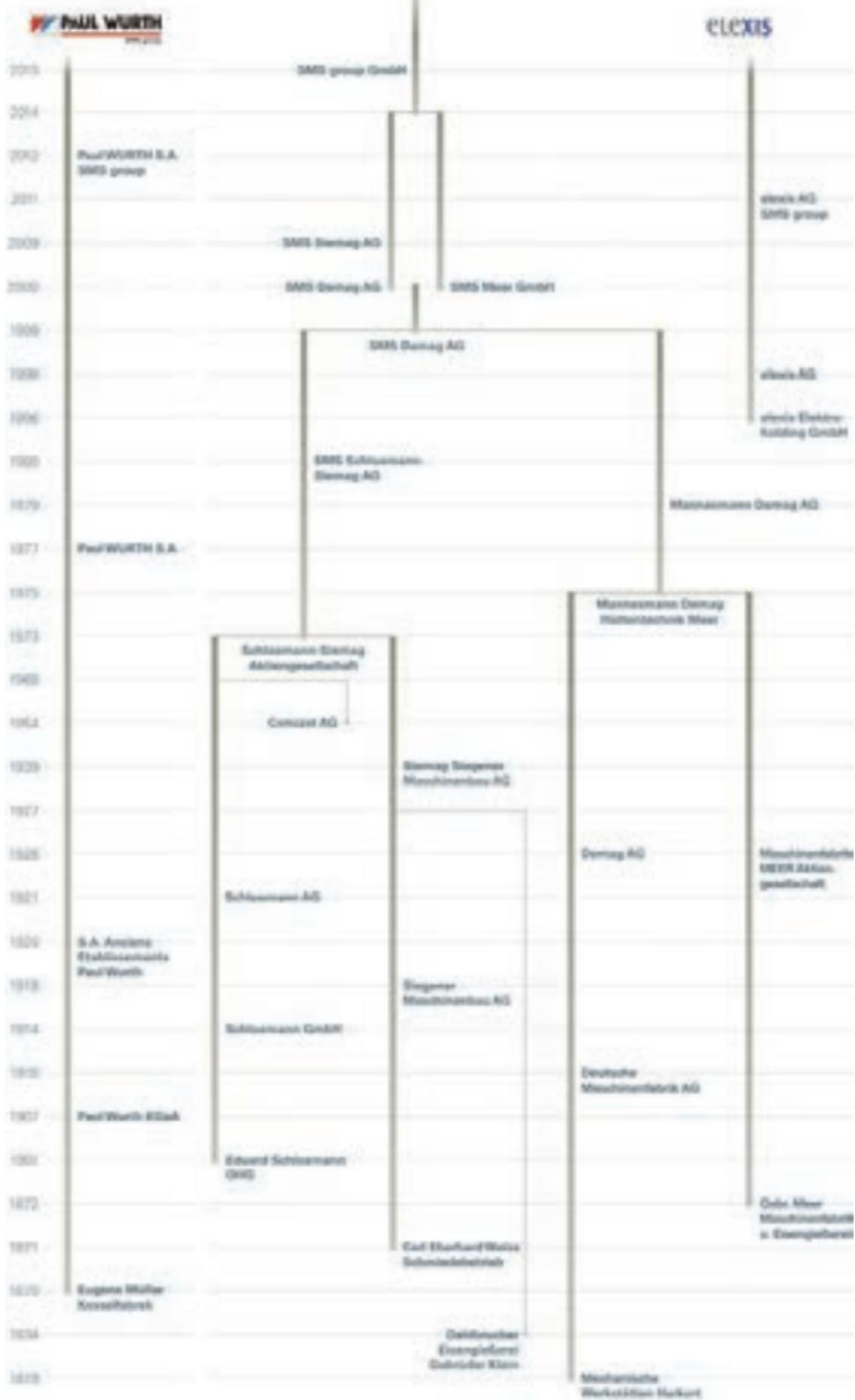
Strong Roots, Continuous Development

Close Relations from the Start

For four generations the corporate culture of the family-owned SMS group has been based upon clear goals and structures. The cornerstone of the company's development was laid by Carl Eberhard Weiss in Siegen (Siegerland, Germany) in 1871.

Acquisitions, innovations and a determined orientation towards the expectations of our customers have helped us to grow successfully for over 150 years. With our plants, customers can produce sustainably and responsibly.





The Challenge of Megatrends – Urbanization, Mobility, Connectivity, Sustainability



Megatrends show how the world is changing. Especially as an internationally operating company, we know how important it is to look beyond narrow horizons and take these developments into account. In 2018, we focused even more on current megatrends to back up our long-term strategy of sustained growth.

Out of all the megatrends, we identified four as particularly relevant for our work as a partner in the metal industry. We see them as an inspiration for our work.

Urbanization is about building cities and is a key area that makes increasing demands on materials. There is a similar situation in the field of **mobility**. People are on the move more and more, and they want their journeys to be safe, clean, and fast. Steel, aluminum, and electrical sheet metal for the construction of cars, trains, and planes must meet the very highest standards.

Urbanization

- The basis: High requirements of steel as a production material
- The challenge: Multiple benefits in one product
- The process: Developing technologies and establishing them on the market
- The benefit: Experience makes us a strong partner
- The vision: Huge steel beams for exceptional projects

Mobility

- The basis: Mobility requirements are increasing continuously
- The challenge: Strong yet lightweight materials
- The process: Developing technologies tailored to customers
- The benefit: Complete package with know-how and assistance
- The vision: Adapting processes for other business fields



The Challenge of Megatrends – Urbanization, Mobility, Connectivity, Sustainability



The next megatrend, **sustainability**, is driving a change of attitude, especially in our industry. Steel production must become greener. We are already ahead of the curve here, because for decades our research and development activities have been making our plants ever more efficient and developing new solutions. Our slogan “Achieving more with less” reflects our goal of eliminating CO₂ emissions. An important key to this is hydrogen technology.

Process optimizations are at the heart of connectivity, the fourth megatrend. However, **connectivity** only works on the basis of homogenous data. This is the first step toward successful digitalization. At SMS group, we are constantly examining the opportunities and technologies in this area. That is why we have produced a special brochure all about digitalization.

Sustainability

- The challenge: Ever stricter legal requirements
- The process: Developing solutions with customers
- The advantage: Solutions for electronic scrap recycling
- The vision: CO₂-free production of metals

Connectivity

- The basis: Connectivity is the foundation for digitalization
- The challenge: Unstructured automation processes
- The method: From basic fix to sophisticated solution
- The advantage: Twin expertise for profitable projects
- The vision: A clean interface with customers

Harmonized Systems – All Along the Process Chain



Plants
for Ironmaking



Processing Lines
and
Furnace Technology



Flat Rolling
Plants

SMS

In order to successfully meet the diverse requirements of our customers, we have organized our scope of expertise throughout the metallurgical process chain.

Our business units are tightly coordinated and processes are geared towards the customer. In-house workshops in the high demand regions of the world ensure uniform quality standards which are synchronized to the individual expectations of our customers.



Metallurgy and Environmental Technology



Technical Service



Forging Plants



Electric and Automation



Long Product Plants



SMS digital

group

Ironmaking and Direct Reduction Plants



The Paul Wurth S.A. (Luxembourg) range covers the entire spectrum of plants and machinery for producing pig iron.

Paul Wurth has production facilities in Europe, China and India. An international network of sites is home to our engineering and sales experts. They are in continual close contact and cooperation with the leading steel producers.

New plants, modernizations, and environmental technologies are the focus of over 1,400 specialists at Paul Wurth.

Coke Oven Plants

- Coke oven plants
- Coke oven batteries
- Coke oven auxiliary plants
- Coke oven automation and control
- Coke oven handling machines
- Environmental protection technologies for the metal industry
- Steelmaking by-product recycling plants

Blast Furnace Plants

- Blast furnace construction and modernization
- Stockhouse and charging systems
- Blast furnace top charging systems
- Blast furnace proper design
- Blast furnace lining and cooling
- Hot blast stoves and energy recovery
- Blast furnace gas cleaning systems
- Furnace automation and control systems
- Coal grinding, drying, and pulverized coal injection plants
- Tapping and measuring technology
- Slag granulation
- Pig casting machines

Direct Reduction Technology

- Midrex® direct reduction plants
- Rotary hearth furnaces

Metallurgy and Environmental Technology



A dense network of locations for sales, engineering and the production of steel works and continuous casters connects our specialists with customers all over the world.

Our technological roots go back to the beginnings of industrial steel production. Continual developments guarantee that which our customers wish for: efficient, flexible, easy to maintain plants, tailored to suit specific market conditions.

Innovative packages for maintenance and modernization ensure economic operation over long plant life cycles.

Metallurgical and Steelmaking Technology

- Submerged-arc and electric smelting furnaces
- Induction furnaces
- Copper converters
- Vacuum converters
- CONARC®, converter and electric steelworks with the components BOF and AOD converters, electric-arc furnaces and S/EAF and SHARC for the production of carbon, stainless, and rustproof steels as well as special grades
- PEM (Primary Energy Melters)
- Pig iron pre-treatment, secondary and tertiary metallurgy
- Auxiliary equipment

Continuous Casters

- Billet, bloom, and beam blank production (rectangular, square, round, profile)
- Medium, thick, and jumbo slabs
- Thin and ultra-thin slabs, (CSP®/CSP® micro continuous casters)
- BCT® Belt Casting Technology plants

Environmental Technology

- Gas cleaning systems
- Plants for energy recovery
- Water treatment systems
- Plants for waste material processing and recycling

Flat Rolling Plants for Steel, Aluminum and NF Metals



A wide spectrum of sizes, surface properties and metallurgical structures defines the breadth and depth of our range.

SMS group flat product plants are produced in the most up-to-date workshops. Our know-how has been growing for generations. It is evident in a large number of application based patents. Their corresponding technologies are implemented in customer specific, future oriented solutions.



Long Product Plants



The plants and machines of the SMS group section mill range serve our customers in the production of a wide and demanding product spectrum. Included are among others, sections, merchant bars and bright steel.

That's where our expertise in all known manufacturing processes comes in, so that we find the best technologies to meet your demands.

Section and Billet Mills

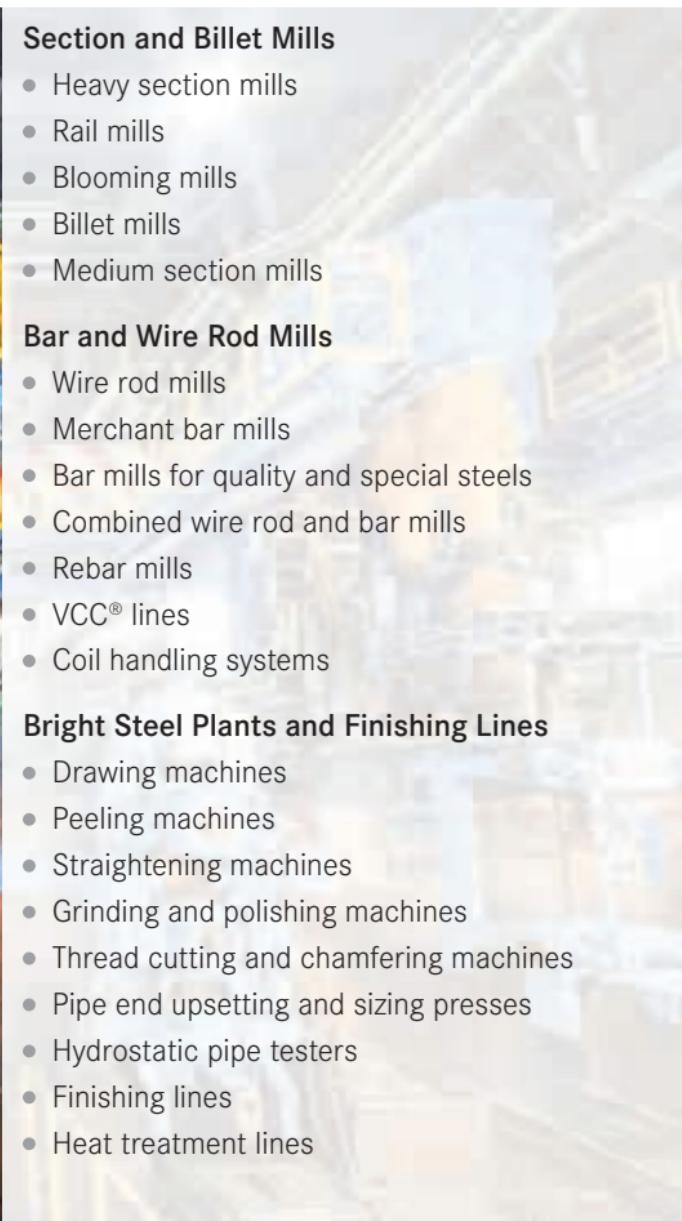
- Heavy section mills
- Rail mills
- Blooming mills
- Billet mills
- Medium section mills

Bar and Wire Rod Mills

- Wire rod mills
- Merchant bar mills
- Bar mills for quality and special steels
- Combined wire rod and bar mills
- Rebar mills
- VCC® lines
- Coil handling systems

Bright Steel Plants and Finishing Lines

- Drawing machines
- Peeling machines
- Straightening machines
- Grinding and polishing machines
- Thread cutting and chamfering machines
- Pipe end upsetting and sizing presses
- Hydrostatic pipe testers
- Finishing lines
- Heat treatment lines



Long Product Plants



SMS group is one of the world's largest manufacturers of plants and machines for all tube and pipe manufacturing processes. Included in our portfolio are seamless tube plants, welded tube plants, large-diameter pipe plants, and spiral pipe plants as well as finishing plants and machines. We plan and supply all the machines required for each specific process, creating a configuration that ensures both the efficiency of the plant and resource-saving production.

Seamless Tube Plants

- Cross roll piercing mills
- PQF®, MPM, and mandrel mills
- Assel mills
- Push bench/CPE/TPE mills Plug mills
- Hot pilger mills
- Expanders
- Sizing and stretch-reducing mills
- Cold pilger mills

Welded Tube Plants

- ERW welded tube plants for tubes up to 26"
- LSAW large-diameter pipe plants for pipes up to 64" (JCOE and UOE process)
- Expanders
- Coil preparation
- Spiral pipe plants (online/offline process)
- Submerged arc welding plant for finish and rewelding
- Coating technology

TBK Automation and Measuring Technology

- Contour measurement with laser light section sensors for
 - wire and rod
 - light and medium sections
 - rails
 - heavy sections, large bars, and billets
 - tubes
 - special applications such as rings, wheels
- Waviness and straightness measurement
- Surface analysis

Processing Lines and Furnace Technology



The SMS group has over six decades of experience in plant technology for processing raw metals. These include in particular, metal strip, bars and tubes.

Worldwide, there are over 750 specialists with their know-how close to our international customers. Our plants and technologies ensure the fast addition of value along the complex process chain of steel, stainless steel and aluminum by pickling, annealing, coating and other demanding types of processing.

Strip Processing Lines

- Pickling lines
- Hot-dip galvanizing lines
- Annealing lines
- Coating lines
- Annealing and pickling lines for stainless steel
- Processing lines for aluminum strip
- Processing lines for Si-electric strip
- Acid regeneration plants
- Hydrometallurgical plants

Thermal Process Technology

- Furnaces for heat treatment of steel and nonferrous metals
- Cooling plants for heat treatment of steel and nonferrous metals
- Drying furnaces for steel and nonferrous metals
- Furnaces in CSP® plants
- Reheating furnaces

Forging Plants



With their innovative technologies and integrated automation, SMS group forging plants and presses give our customers the greatest possible flexibility when designing their individual production programs.

Forging Plants and Presses

- Open-die forging presses
- Closed-die forging presses
- Radial forging machines
- Ring and wheel rolling machines
- Forging manipulators
- Extrusion presses

Aluminum Plants

- Smelting furnaces
- Casters (vertical/horizontal)
- Homogenization plants
 - Continuous homogenization plants
 - Chamber homogenization plants
- Charging machines
- Ingot scalpers and turning equipment
- Band saws
- Plate stretchers
- Extrusion presses for light metal
- Drawing plants

Copper Plants

- Anode casting wheels – CONTILANOD
- Copper wire mills – CONTIROD®
- Copper tube plants – directube®
- Technica continuous casting plants (vertical/horizontal)
- Extrusion presses for heavy metal
- Drawing plants
- Straighteners
- Inner grooving lines

Additive Manufacturing and Powder Metallurgy

- Powder atomization plants
- Turnkey solutions on AM volume production
- AM applications
- Powder presses

CONTIROD® is a registered trademark of Aurubis, Belgium.

Electric and Automation



SMS group's Electric and Automation is perfectly geared to the technological and operating requirements of your plants. Worldwide, there are more than 1,000 specialists who provide expertise from locations in Germany, the USA, China, and India. Whether you procured a new plant or a revamp, we cooperate closely with you and support you over the entire service life of your equipment.

To ensure rapid commissioning, SMS group applies its unique Plug & Work process. This involves experts testing and optimizing your entire automation system using the original control units during a real-time simulation of the production process.

General solutions

- Production planning and control systems
- Extensive process know-how in modular X-Pact® automation solutions
- Control and visualization systems
- Plant safety according to EU regulations
- Drive systems
- Energy supply and distribution
- Plug & Work testing and digital twins
- Hardware design and integrative engineering
- Full service 24/7 worldwide
- Digital solutions

Complete solutions for

- Metallurgical plants and environmental technology
- Flat rolling plants
- Long products
- Processing lines and furnace technology

Digital Applications and AI

SMS  digital

SMS digital is the digital entity of SMS group and is responsible for the development of new, digital solutions and business models surrounding the core business of SMS group.



The task is to engage directly with our customers to identify suitable digital products and to develop and market them in close cooperation with the business units of SMS group. As the face of digitalization, we tackle the challenges of digital transformation and Industry 4.0 and develop high-end solutions in close cooperation with our customers.

Using modern development methods, metallurgical process know-how, and technological expertise, we ensure that our products perfectly meet our customers' needs. Digital applications and the use of artificial intelligence (AI) help us to take our plants and machines into the world of Industry 4.0.

Sensor systems

- Ladle tracking systems
- Torpedo-car-GPS tracking
- Process guidance
- Automatic tapping
- HD LASr
- Fiber optical mold sensor
- Ultrasound-based cast measurement
- Intelligent spindle
- Intelligent furnace
- Laser welding technology
- Rope monitoring

Proven programs

- Production, planning, & logistics
- Product & quality
- Machine condition & maintenance

Central platform

- Genius CM®
- Performance Enrichment Analysis
- Smart Safety Guard
- Order Platform
- VR/AR simulation
- HD LASr
- Smart Alarm

Technical Service Along the Process Chain

Spare Parts & Logistics

- OEM spare parts
- Spare parts management
- Warehousing

Upgrades & Modernization

- Mechanical & hydraulic
- Electric & automation
- Value added components

Maintenance & Repairs

- Emergency support
- Inspection, repairs, servicing
- Maintenance tools
- Long term maintenance services

Consulting & Training

- Fact finding
- Maintenance audits
- Feasibility studies
- TECademy

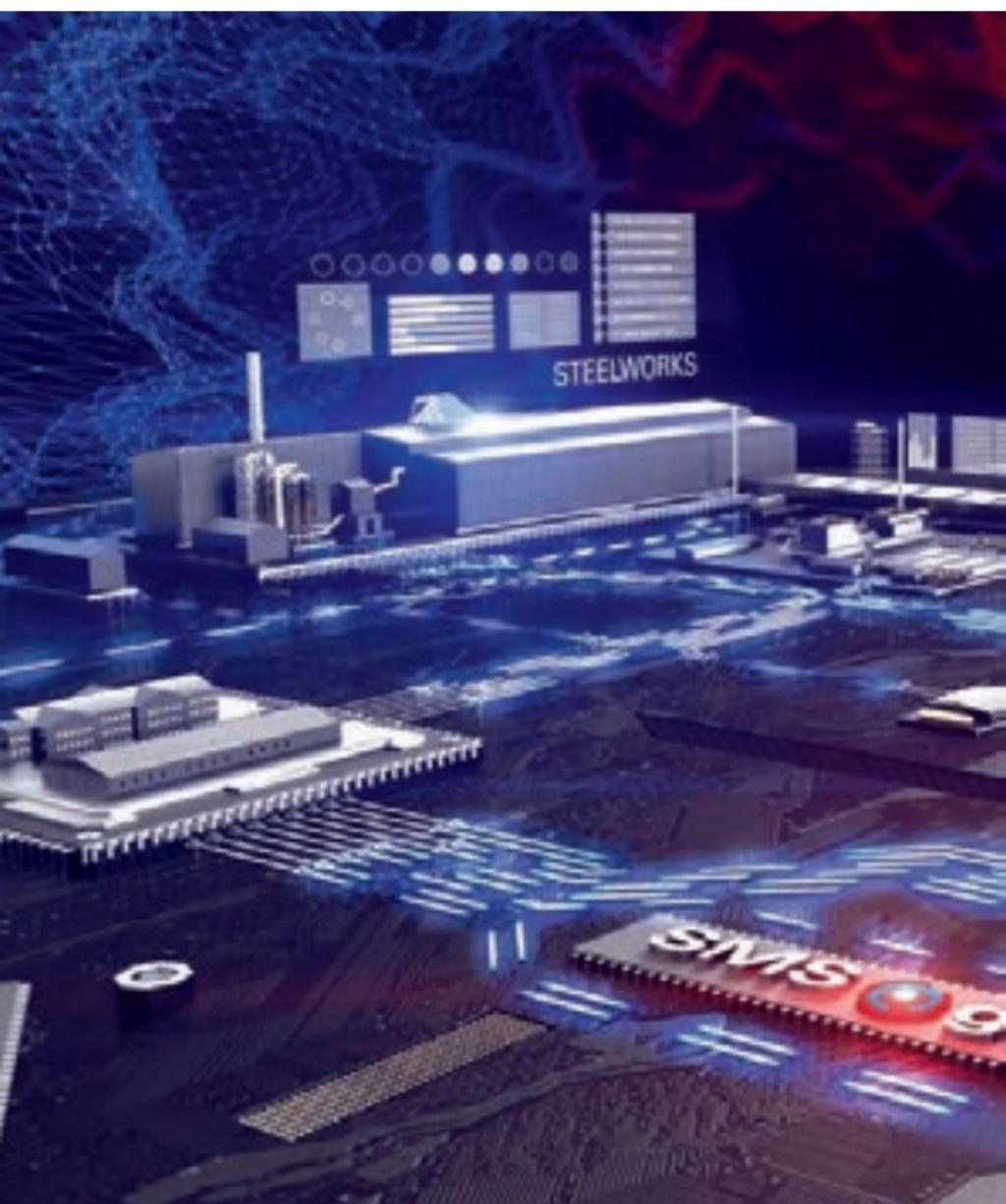
Whether you want spare parts, modernizations, tailor-made maintenance procedures, or customized training programs: the Technical Service Division of SMS group is ready at 50 locations around the world to offer you service packages geared to your requirements along the entire metallurgical process chain. It's due to the know-how of the entire SMS group that our employees provide the services you require – on schedule, within budget, and in the right quality.

That means you can rely on the quality of our services as well as our global presence to reduce downtimes, increase productivity, and ensure the lasting value of your machinery and plants.



Cooperation – The Basis of Success

Engineering, production, comprehensive project management



From Single Machines – All the Way to Turnkey Projects

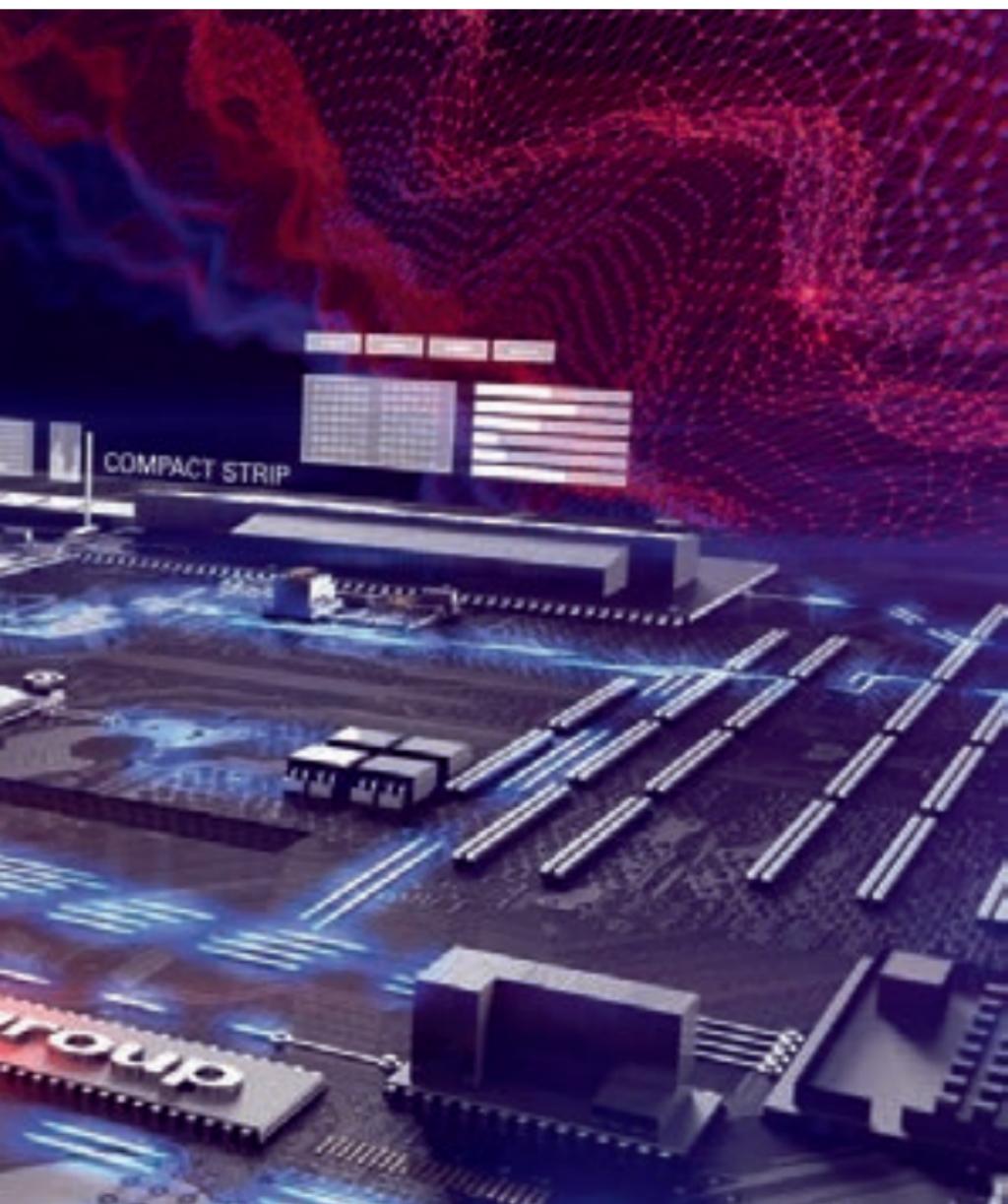
Keeping promises, striving for perfection and first-class quality are the driving force for meeting our customers' expectations. Our know-how reaches as far as the construction of turnkey plants.

A Passion for New Challenges

SMS group plants are highly dynamic. We offer integrated concepts consisting of:

- All mechanical systems, automation, digitalization, technology and individual service.

This combination ensures outstanding results which our customers profit from, for generations.



Your Demands to the Point – The Customer's Benefit Always in Mind



Adding Value Along the Process Chain

Our customer oriented activities are tailored to suit your requirements:

- Flexible plant and machine configurations, keeping the market developments of your finished products in view
- Technically and economically balanced concepts
- Steep ramp-up curves with fast return on investment
- Comprehensive, life-cycle oriented service concepts
- A dense network of locations with technicians and economists for your continual support 24/7 service
- Participation in a continuous exchange of information from research and development.

Over 14,000 members of staff at the SMS group ensure all-round, efficient implementation.



People

SMS group – A Learning Organization



Responsibility for our employees

The people at SMS group are the foundation on which the company's success is built. Accordingly, we have put in place future-oriented human resource policies that take account of the huge social responsibility we bear.

Our objective is to promote and strengthen the satisfaction and dedication of our employees. In specific terms, this means that we, as an employer, must also continue to evolve so that we can offer our staff a working environment that is fair and attractive as well as safe and secure.

We bring in creative new talent to join our teams, while at the same time cultivating our international character. Special importance is always attached in equal measures to the development of our employees, and not just with topics such as the leadership and corporate culture, a focus on values and customers, and to the development of their professional and personal potential.

We pursue clear work, health, and environmental protection policies by applying our own and internationally recognized standards to meet our statutory obligations.



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