CONTINUOUS CASTING
The world’s leading technology for long products
Expertise and experience, reliability and flexibility – these are the hallmarks of SMS Concast. This leading supplier of electric steelmaking and casting technology helps customers worldwide achieve a competitive edge in their markets. SMS Concast offers high-performance plant and machinery for steelmaking, secondary metallurgy and continuous casting.

To perform well in areas such as consulting, engineering, commissioning and service, our employees offer a combination of both outstanding expertise and flexibility. That’s why SMS Concast solutions deliver such excellent benefits for their customers.

SETTING BENCHMARKS WITH EXPERIENCE
Since 1954, SMS Concast has supplied more continuous casting installations than anyone else in the industry. Over the years, it has designed a great range of innovative products that improve the steelmaking process.

INTEGRATED SOLUTIONS
SMS Concast belongs to the SMS group and is part of the SMS Meer business area. Together, SMS Concast and SMS Meer are able to better serve the growing demand for state-of-the-art minimills. The two companies turned the idea of an integrated plant with an electric arc furnace (EAF) and rolling mill into reality.
The SMS group is among the leading plant and machinery construction companies for steel, aluminum and non-ferrous metal processing. It comprises two business areas: SMS Siemag and SMS Meer.

**SMS SIEMAG**
SMS Siemag has more than 100 years’ experience in reduction processes. Additionally, it is a leader in steelmaking and secondary metallurgy technology. SMS Siemag’s extensive portfolio also includes continuous casting, CSP® technology, hot and cold rolling mills, strip processing plants, and aluminum plants. The high-quality steel products of SMS Siemag start with thin, medium and thick slabs. SMS Siemag’s products are used in the steel, aluminum and non-ferrous metal industry worldwide.

**SMS MEER**
SMS Meer is a leading supplier of plant and machinery for steelmaking, tubes, long products, forging and heating technology. Its solutions provide customers with tangible benefits in challenging markets: steel for tire cord, tubes for pipelines, heavy structural profiles, wheels for high-speed trains, and aluminum for use in skyscrapers and offshore wind turbines.

Within the SMS Meer business area, SMS Concast is the specialist in long product steelmaking.
INNOVATIONS YOU CAN RELY ON
Outstanding developments in casting technology

Continuous casting machine operators rely on SMS Concast, the market leader in technology, design and state-of-the-art continuous casting plants and machinery for long products. Specializing in production facilities for billets, small, medium, large and super-large blooms, as well as beam blanks and round blooms, the company is a recognized innovator and technological leader in its field.

BENEFIT FROM MORE THAN FIVE DECADES OF EXPERIENCE
SMS Concast has significantly influenced and improved the development of the continuous casting industry and has set outstanding benchmarks. SMS Concast’s proven knowledge of the entire metallurgical process and more than 55 years’ experience, combined with cutting-edge automation, give companies a competitive edge.

INCREASE COMPETITIVENESS WITH OUTSTANDING PERFORMANCE
Continuous casting machines by SMS Concast deliver outstanding performance by ensuring the consistent high quality of the cast products, while delivering benchmark plant productivity. High availability and output is achieved through superior equipment design and manufacturing quality.

CUSTOMIZATION IS THE KEY TO SUCCESS
SMS Concast’s extensive knowledge and experience enables it to customize its solutions to virtually any task. SMS Concast offers tailored concepts and a wide range of specialized products which improve product quality and production processes, both for new plants and plant refurbishments and modernizations.

A LOCAL, WORLDWIDE SERVICE
Just like its plants and machinery, SMS employees are at work around the world – so plant operators can always find a service representative nearby. Comprehensive customer advice, reliable support for day-to-day operations, and collaboration on new developments and improvements, are a given with SMS Meer.
BLOOMS
The foundation for high-end products

Bloom sections are the most widely used primary material in the production of ultra-clean, high-strength carbon wire, special forgings, cutting-edge automotive engineering steel, ball-bearing steel and stainless steel products. The high quality of blooms produced using SMS Concast bloom casters ensures fine steel products with the very best properties. The same applies if the final products have large dimensions, such as axles for trucks, crankshafts, springs, rails, or power-generation shafts.

CASTING WITH UP TO EIGHT STRANDS
Rectangular bloom sections can be up to 600 mm in width and up to 450 mm in height. Bloom casters can be built with up to eight strands and a typical machine radius of between 10 and 18 m, or even as fully vertical casters.

Continuous casters for high-end products normally include Dynamic Mechanical Soft Reduction (DMSR). DMSR reduces center fluid absorption and carbon segregation, enhancing the quality of the final product. The system is controlled using dedicated, advanced process-simulation software that constantly and dynamically recalculates the actual solidification profile.

BENEFITS AT A GLANCE
- Large tundish volume for inclusion floating
- Steel flow control with stopper mechanism
- Hydraulic mould oscillation improves surface quality
- Integrated tubular mould or plate mould
- Eddy current mould level measuring
- Electromagnetic mould-, strand- and final stirrer
- Long containment zone
- Air mist secondary cooling
- Dynamic Mechanical Soft Reduction (DMSR) counteracts porosity and cracks in the bloom
- Metallurgical models, dynamic and online within the level 2 system
- Top or bottom feeding chain dummy bar
- Modern dummy bar system designs for shortest restranding time
- Straightening concepts for biggest section sizes
Jindal South West (JSW) Steel expanded its steelworks in Toranagallu/Karnataka, India, to a total production capacity of 2.8 million tons per year. Key to this project is the eight-strand billet caster supplied by SMS Concast, which has an annual capacity of 1.7 million tons per year. The production process features the hot charging of billets to the rolling mill, and is directly aligned with the downstream wire rod and rebar rolling mills. SMS Concast’s state-of-the-art automated machinery and equipment make this steelworks one of the most modern on the Indian subcontinent: Convex-Technology® molds with hydraulic oscillation systems result in perfect surfaces and a consistent temperature profile, while electromagnetic stirrers ensure the best possible internal quality – right to the center of each billet.

FIRST EIGHT-STRAND CASTER IN INDIA
ROUND BLOOMS
High levels of purity for high-end applications

Round blooms feature the most homogeneous cross section in terms of both temperature distribution and internal structure. As with rectangular blooms, round bloom casters can be designed for up to eight strands. SMS Concast supplies curved casters for round blooms with a diameter of up to 1000 mm (the largest in the world).

IMPROVED INTERNAL BLOOM QUALITY
Even for round strands, Dynamic Mechanical Soft Reduction (DMSR) is a must, as well as state-of-the-art-technology to ensure the soundness of the big cross sections. SMS Concast’s technologically advanced DMSR systems apply the right forces to the round bloom section at the transition from 100 percent liquid to the mushy bloom zone, taking into account the metallurgical restraints, stress limits for each steel grade, and casting condition. The result is highest-quality product across the entire cross section.

BENEFITS AT A GLANCE
- Steel-flow control with advanced stopper mechanism
- Hydraulic mold oscillation, for better surface quality
- Tubular molds for even, large sections
- Eddy current mold-level measuring system
- Electromagnetic mold, strand and final stirrers to support globular structure
- Air mist secondary cooling
- Dynamic Mechanical Soft Reduction (DMSR) prevents fluid absorption and cracks in the bloom
- Dynamic and online metallurgical models through level 2 control system
- Modern dummy bar system designed to ensure shortest possible restranding time (e.g. fed from the top)
- Straightening concepts for largest sections (1000 mm in diameter)
BEAM BLANKS

Think bigger. The world’s largest beam blank, produced using SMS Concast technology

Beam blanks are the most common near-net-shape products used as feedstock in medium and heavy section mills. This special casting technology was invented by SMS Concast and provides significant cost reductions in the rolling of shaped sections. The large number of beam-blank casters supplied since 1968 serves as a testament to SMS Concast’s expertise and technological leadership in this area.

END-TO-END FLEXIBILITY

Beam-blank sections range from 250 to 1,150 mm wide, and from 150 to 500 mm high. Beam-blank casters are built with a typical machine radius of 9 to 12 m, tailored exactly to the plant operator’s specific requirements.

PREVENTING TRANSVERSE CRACKS

Where beneficial, SMS Concast can equip the casters with special strand-reheating systems to control the beam-blank tip temperature before entry to the straightening zone. This is particularly important when micro-alloy steel grades are cast in large beam blanks, both to optimize the metallurgical properties and avoid transverse cracks.

BREAKING RECORDS

The world’s largest beam-blank section is 1,150 mm wide, 495 mm high, and has a web thickness of 130 mm. It was installed and commissioned in February 2008 by SMS Concast for Germany-based Peiner Träger GmbH, a subsidiary of the Salzgitter Group.

BENEFITS AT A GLANCE

- Large tundish volume for inclusion flotation
- Hydraulic mold oscillation for high-quality surfaces
- Tubular molds for small and medium-sized beam blanks
- Plate molds for medium and large beam blanks
- Single or double open-stream/submerged casting technology
- Air-mist secondary cooling
- Water-removal system
- Special features for casting micro-alloyed steel grades
- Control when reheating flange tip temperature
For a wide range of products

SMS Concast designs highly versatile casters, providing greater flexibility in production so that plant operators can react to changing market demands extremely quickly. The steel grades range from simple construction steel (rebar) to state-of-the-art Special Bar Qualities (SBQ) for the automotive industry and other engineering applications, as well as high-grade wire products. Typical products manufactured using SMS Concast continuous billet casters include steel grades for soft-steel wires, pre-stressed concrete reinforcing wire, tire cord and stainless steel for bars and wires. Billet sections cover rectangular, square and round sections, from 85 to 240 mm. SMS Concast builds these casters using up to 10 strands with a machine radius of between six and 10 m.

CUSTOMIZATION AND PROVEN CONCEPTS MEET OPERATORS’ DEMANDS

For the discharge area at the end of the casting machine, SMS Concast offers a particularly wide variety of tried-and-tested concepts to satisfy the specific needs of each plant operator:

- Direct charging of hot billets to the rolling mill, reducing the cost of reheating equipment and energy
- Tertiary slow cooling to allow for sufficient hydrogen diffusion
- Optimization of caster throughput for maximum productivity with reduced billet-handling operations

Almost every SMS Concast casting machine has a unique discharge concept.

Through marking machines and an associated Optical Product Recognition (OPR) system, SMS Concast supports steel plants in meeting end users’ increasingly high demands in terms of quality. The OPR closes the gap in product tracking, offering a reliable system for end-to-end monitoring from the melt shop to the rolling mill: OPR is incredibly efficient and easy to operate, even if the rolling mill is located thousands of kilometers away from the melt shop.

BENEFITS AT A GLANCE

- High plant productivity (up to 2.3 million tons per year)
- Optimized tundish volume for inclusion flotation
- CONVEX Technology® and INVEX® molds ensure maximum production quality
- Cartridge mold design for rapid changeover time
- Steel-flow control with advanced stopper mechanism
- Hydraulic oscillation
- Mold, strand and final stirrer
- Air-mist secondary cooling, plus hard cooling for certain steels
- SMS Concast Continuous Straightening (CCS) with two or more unbending points
- Rigid dummy bar with automatic disconnection for quickest possible restranding time
AUTOMATION
Assures quality, reduces downtime

SMS Concast offers a proven, efficient portfolio of integrated automation and control packages to ensure products of the highest quality from the very start of the solidification process. The integration of innovative sensor systems with cutting-edge control techniques ensures mold liquid steel level stability, reduces surface defects and minimizes downtime for maintenance.

MONITORING PRODUCT QUALITY USING LEVEL 2 CONTROL SYSTEMS
Level 2 control systems manage and monitor the casting process using recipes and settings predefined by the metallurgist or the relevant standards. In addition, each casting recipe includes a set of quality assessment parameters that indicate the best conditions for producing the target product quality. A set of metallurgical models means the casting process can be fully automated, minimizing the need for operator input or intervention. The process model connects all faculties to achieve optimize overall performance.

TECHNOLOGICAL PACKAGES FOR CONTINUOUS CASTING INCLUDE
- Steel-flow control with stopper mechanism
- Mold-level control
- Mold powder level control
- Automatic start of casting
- Mold breakout prevention system
- Mold, strand and final stirrer
- Hydraulic mold oscillation
- Heat-tracking model
- Real-time quality evaluation
- Cut optimization model
- Real-time strand solidification model
- On-line/off-line solidification curves calculator
- Dynamic Mechanical Soft Reduction (DMSR)
- Dynamic secondary cooling control
- Billet/bloom marking machine
- Optical Product Recognition (OPR) system
- Process analysis and simulation
- Metallurgical data management
- Production delays detection
- Equipment life tracking
- Billet and bloom handling logistics, including tertiary cooling
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.