Billet casting solutions

Technology, mechanics, automation and electrical engineering – from proven standards
Your challenge: To react quickly and flexibly to the growing demands of the market

The market demands a lot
According to current forecasts, worldwide demand for steel is set to grow considerably by the year 2015. This increased demand must be met in the billet casting branch with an expansion of capacity, an increase in casting speeds and a general increase in plant productivity. Mainly the heavily populated Asian countries are driving the global market. Continuous growth requires continuous optimization of the casting process to ensure global competitiveness.

Solutions for plant optimization
Requirements for billet casting plants have constantly increased in recent years. Especially casting speeds have steadily become faster. In older plants, frequent section changes are not as easy as they should be. A great deal of time is wasted with this part of the process, and of course time is money. In the intensely competitive environment of the steel industry, a high degree of flexibility and customer orientation is absolutely essential for lasting success. That’s why the majority of steel producers are seeking cost-efficient solutions to optimize their plants so they can meet the demands of competition.

Increasing productivity and stable plant availability
Plant operators will have to continue optimizing output parameters in the future to achieve capacity increases and quality improvements with decreasing operating costs. This is the only way for them to strengthen their market performance over the long term. In the future, a maximum degree of automation will be required to ensure process reliability and maintenance-free operation. This will optimize the interface between mechanical and electronic process components.

Flexible market performance
Does your billet casting plant meet your requirements and those of your customers for modern production when it comes to flexibility and cost effectiveness? Have you already calculated how much time you lose readjusting your plant? You haven’t? Then now’s the time to do so. Our technologies and solutions focus on the decisive points that determine quality and economy. This applies especially to the modernization of existing plants. Perfect coordination of the process parameters is usually decisive for market success, and the better you can meet your customer’s specific requirements with your expertise and products, the more you can boost your performance in the market. We invite you to work with us in meeting these challenges.
As demand for long products continues to grow, requirements for product quality and productivity, availability and process reliability in plants are also increasing.

You expect ...

- Higher plant availability in view of increasing steel consumption
- Modern concepts for high plant performance
- Flexible technological upgrades in response to growing quality requirements
- Increasing of casting speeds – to maximize productivity
- Decreasing operating and maintenance costs to offset growing cost pressures
World markets are rapidly changing any day and becoming increasingly difficult to anticipate. The trends are leading to continuously higher capacities at lower production costs. Keeping up with these demands requires optimized, full-line solutions in the shortest possible time. And working in close collaboration with our customers, that’s exactly what we at Siemens VAI deliver.

Advantages of Siemens VAI billet caster solutions:

- High reliability and ease of operation – through the widest possible standardization
- Optimization of your processes – through proven technology packages and tested automation solutions
- Increased casting speed – with proven high-speed casting technology (SIMETAL DiaMold technology)
- Fast return on investment – through reduced operating and maintenance costs
- Boost your competitive edge – through technology from the market leader, for example with hydraulic oscillators (e.g. SIMETAL DynaFlex)
- Profit from our experience – in all metallurgical processes and our innovative strength
- Higher plant performance – through life-cycle partnership for the entire life-cycle of your plant and beyond
Our solution: Innovative and sustainable billet casting technologies

Expertise from a single source
You have very specific requirements and desires for the future of your billet casting plant, and we can provide you with optimum output in the shortest possible time. Profit from our full-line expertise that has made us a first-rate supplier to the world market for over forty years, with more than 170 machines respectively 750 strands installed or upgraded. There’s just one question left to answer: How exactly can we help you?

Module or complete package
This is both the question and the answer. We offer our customers precisely defined, modular technology packages to meet their specific requirements. Those requirements might be for a new plant or the modernization of an existing one, for SIMETAL DiaMold or SIMETAL DynaFlex technology, for optimized secondary cooling or improved water treatment. It’s your choice, and we work together with you to decide which solution is best.

Putting our innovation to work for you
The name Siemens VAI stands for leadership in innovation. We’ve established a decisive competitive advantage in the area of R&D, not least because our headquarters are located very near a steelmaking plant. The crucial point: Our innovations are directly relevant to the market. After all, we know not only which technology you need as a plant operator, but also which product qualities your customers need and expect. We invite you to work with us in applying our innovative strength to optimize your billet casting plant.

Service orientation
Our service expertise includes capacity analyses and feasibility studies in advance of projects and coaching of your employees, as well as spare parts production and continuous updating of technology. And we don’t want to forget to mention our long-term, customer-specific Siemens VAI financing models. Everything we do is with one goal in mind – to help you achieve maximum process reliability throughout the entire life-cycle of your plant.
Our technology paths:
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Compact and modular billet casters from Siemens VAI feature advanced technological packages and special caster equipment and components. They perfectly match the steadily growing demands of today’s continuous casting machines: high productivity, high production flexibility and a high level of product quality.
Up to 50% higher casting speeds
High production flexibility and quality require a machine equipped with an optimized combination of technological equipment, process technology and automation. Siemens VAI supplies tailor-made solutions for billet casting applied from more than 750 installed or upgraded billet caster strands. The Siemens VAI billet casters allow for even 50% higher casting speeds, depending on steel grade.

High performance billet casting
The modular caster design paired with SIMETAL DiaMold high-speed casting technology enables plant operators boost plant productivity to formerly unattained levels. A package of quality assuring technologies helps steel producers meet today’s and future market requirements. All components and systems are designed in accordance to applicable norms and standards and equipped with integrated production and process automation control in order to provide the highest possible degree of reliability. The billet caster includes the SIMETAL DynaFlex hydraulic oscillator providing a new production flexibility in combination with the modular equipment design for fast exchange. One of the most attractive benefits is certainly the lower operational costs through robust, long-life components and easy maintenance due to the modular equipment design.

Scope of supply and services:
- Billet caster for casting rebar steel grades
- High-speed casting applications
- Advanced machine components
- Caster modernization
- Automation packages

Main benefits:
- Higher productivity
- Better quality
- Improved reliability
- More flexibility
- Lower operational costs

Revamping at it’s best
Through the use of modular technology packages, we achieve short revamping times and extremely fast start-up curves using modernization measures such as high casting speed and flexibility using fast section change with a huge variety of steel grades.

With our modernization expertise, we support our customers through to full production operation. In addition to our methods and tools, we offer long-term support through our life-cycle management.
Special automation solutions ensure easy, safe and reliable production. The high degree of process reliability guarantees reproducible results on the highest level.

**Main design features:**
- Ladle turret and ladle car
- Tundish car
- High capacity tundish with optimized design
- Quick nozzle changing system
- SIMETAL LevCon mold level control system with autostart
- SIMETAL DynaFlex oscillator stationary or retractable type
- SIMETAL DiaMold high-speed mold
- Electromagnetic mold stirrer
- Withdrawal system with continuous straightening method
- Rigid dummy bar system
- Roller tables
- Torch or hydraulic shear cutting equipment
- Hydraulic turnover cooling bed
- Process automation systems SIMETAL CC Control and SIMETAL CC Optimization
The demands on today’s continuous casting machines are high productivity, high production flexibility and a high level of product quality. This can be covered by higher casting speeds with minimized equipment downtime. The machine head from Siemens VAI supports you in achieving your goals regarding higher production flexibility and higher quality with the optimized combination of technological equipment, process technology and automation.

**High-performance machine head**
Siemens VAI has revolutionized the design of machine heads for billet and small bloom casters. The results demonstrate enormous improvements with respect to operational flexibility and maintenance costs. The high-performance machine head offers top cast product quality and unsurpassed casting line reliability. The modular design enables minimum size change and turnaround times in combination with maximum production and maintenance flexibility. The mold level measurement and control ensures a higher quality of the cast strands.

**Main features:**
- Modular design
- Automatic, self-tightening water and utility connections for mold and oscillator
- External mold stirrer for fast mold exchange
- Application of the SIMETAL DiaMold and SIMETAL DynaFlex system technology packages
- Retractable SIMETAL DynaFlex oscillator for mold exchange during casting

**Main benefits:**
- Highest production and maintenance flexibility through fastest size change and turnaround times
- Fast and safe mold exchange (format change)
- Sustainable improvements in maintenance costs
The latest generation of oscillation systems using SIMETAL DynaFlex oscillation technology enables the dynamic adjustment of frequency, stroke and wave form during casting. The hydraulic oscillation drive system with a wear-free leaf spring oscillator guidance system guarantees the highest guiding accuracy, outstanding operational safety and low maintenance costs. Additional operational benefits can be achieved due to an integrated mold friction measuring system, which allows further optimization of the casting process.

The quick coupling of all media supplies facilitates mold and oscillator exchange and the alignment of the mold and the oscillator is completed automatically.

In order to further increase productivity, a retractable version has been developed which allows mold exchange on individual strands during casting on the remaining strands.

**Main benefits:**
- Highest guiding accuracy
- Maintenance-free
- Wear-free operation
- Minimum space demand thanks to cascaded leaf springs
- Only tensile stresses in the leaf springs
- Free of mechanical backlashes in the drives and suspension
- Optimized casting parameters

**Main features:**
- Fixed or retractable version
- Leaf spring guidance
- Hydraulic or electromechanical actuator
- Online adjustment of frequency, stroke and wave form (sinus, non-sinusoidal)
- Mold friction measuring package

Retractable SIMETAL DynaFlex oscillator at Ferriere Nord, Italy
SIMETAL DiaMold is a mold tube with an enhanced tapered shape for optimized strand shell growth through improved surface contact. Furthermore, specially designed tube corner geometry reduces the frictional forces between the strand shell and the SIMETAL DiaMold tube (less pronounced taper in the corner profile compared to the mold face in the lower section).

Existing casters can be easily upgraded by replacing existing copper tubes with a SIMETAL DiaMold. In most cases the mold length does not require extension. Top product quality and increased production safety can thus be achieved at higher casting speeds.

**Main benefits:**
- Increases in speed of over 50% are possible
- Rapid and homogeneous shell growth
- Excellent surface quality due to reduced frictional forces in the mold
- Long SIMETAL DiaMold lifetime due to unique mold design features
- Suitability for open stream and SEN casting
- Any billet caster can be upgraded
The sophisticated, maintenance-friendly concepts are developed to safely move high loads of weight and perfectly meet the high demands in the harsh area of a casting plant.

Siemens VAI offers several ladle support options:
- The ladle car provides an economically efficient solution, especially due to the reduced foundation requirements of this option. The fixed-type ladle turret allows for common rotation of the fork arms thus providing the advantages of a common lift. The butterfly-type ladle turret provides independent lifting of both ladles. And the column-type ladle turret enables common lifting and/or independent swiveling of the fork arms.

**Tundish support systems**
- **Cantilever-type tundish car**
  - Excellent access to the mold area
  - No rail on the casting platform
  - High safety in emergency cases
- **Semi gantry-type tundish car**
  - Excellent access to the mold area
  - Only one rail behind the mold
- **Gantry-type tundish car**
  - Robust and economic solution

**Secondary cooling**
Secondary cooling system with 3 or 4 cooling zones with plain water or air mist. A revolutionary spray pattern provides maximum cooling homogeneity and higher casting stability with fewer nozzles. Moreover, the new nozzle design reduces clogging. The result is: optimized operational flexibility, advanced metallurgical strand cooling, minimized temperature rebound, and reduced stresses for better internal quality.
The basic functionality of SIMETAL CC Optimization is production plan handling as well as heat and billet tracking from the first announcement of a heat until the last billet has left the caster run-out area. Production events (e.g. heat changes, turret and tundish movements) as well as quality-related information are tracked by the system. A close connection to the basic automation system (SIMETAL CC Control) ensures proper signal processing and reaction of the caster models and experts in order to optimize the production process.

**Caster process explorer**
The HMI guides operators through the production process by presenting important information on the main display. Casting operator interaction is limited to quality and safety-related topics.

**MSS – Maintenance and Setup System**
The all-in-one tool for setup, testing, simulation and maintenance. A casting simulator provides the necessary functionality for testing and training operators in an off-line environment in order to achieve smooth system start-ups.

**Yield Expert**
Yield Expert provides tailored strategies for yield improvement as follows: tundish closed optimization strategies, scrap section allocation algorithms, heat sequence or production-plan-based philosophy etc.

**Quality Expert**
SIMETAL Quality Expert assures product quality by supporting the set-up and displaying of the production recipes per steel grade. A detailed tracking of the process parameters during production and a quality rating of the cut billets is also part of the permanent control. Automatic set-pointing of critical process parameters and a dedicated screen that alarms operators in case of deviations between optimum and current process setting help avoiding human errors.

**DynaSpeed**
The DynaSpeed model cyclically determines the residence time of the strand, tracks the cooling practice through the strand guidance, and calculates the water flow setpoint of each cooling zone based on the average casting speed and cooling practice.

**Equipment Expert**
The Equipment Expert supports preventive maintenance through generic definition of machine equipment and automatic and configurable tracking of equipment life. Operators or maintenance personnel are alarmed if life-time criteria are exceeded.

**Speed Expert**
The Speed Expert calculates an optimized casting speed, combining machine protection, sequence casting and quality aspects that impinge on the allowed casting speed.
The Siemens VAI technological and automation packages incorporate all components of the plant equipment to perfectly master the process and its complex parameters in continuous casting plants.

The casting platform PLC is responsible for movements of the ladle turret and the tundish cars in cooperation with the safety PLC which protects the equipment from collision and damages.

**SprayCon**
With its modular software design, SprayCon enables a high range of flexibility for configuring the zone control (water, air) as well as for general control tasks (i.e. inlet valves).

**LubriCon & HydrauliCon**
Flexibly configurable controls for caster lubrication and hydraulic power systems directly after switching on.
- Short implementation and start-up period
- Perfect support for the maintenance personnel as all relevant information is locally available

**DynaGap Soft Reduction**
Using the information of the 3D thermal tracking model DynaGap calculates the soft reduction area and applies the gap to the pinch rolls.

**Mold level control**
SIMETAL LevCon ensures unprecedented mold level stability by dynamic adaptation to changes in casting speeds and steel grade. Thanks to the modular concept, all common types of mold level measurements, flow control mechanics and actuators can be used.

**CC Explorer**
The CC Explorer is a preconfigured standard visualization for technological packages, showing detailed information on the system status to be used by the operational and maintenance personnel.
- Current and historical trends and alarms
- Easy incorporation into new or existing HMI systems
- Suitable for stand-alone solutions

**Main benefits:**
- All technological systems have a mechatronic approach
- Useable as easy-to-integrate packages for complex new casters as well as stand-alone tools for caster revamping
- Software provides the ability to set up projects using only parameter settings
- Optimized service and maintenance due to standardized hardware, sensors and actuators
- Due to integrated offsite testing, short installation and start-up times can be achieved
In a steel works environment, particularly where liquid hot metal is manipulated, operators are continually exposed to dangerous working conditions. It can be expected that safety standards will improve over time and that eventually no operator will be allowed to work in dangerous liquid steel areas. Although existing solutions for casting floor automation represent important steps for improved personnel safety, operators still have to be present on the casting floor with all of the known dangers. For this reason, we have developed a groundbreaking technology for completely man-free operation.

SIMETAL LiquiRob

The SIMETAL LiquiRob® technology allows for fully automatic casting floor operation – from the start to the finish of casting. This robot system is capable of performing a multitude of tasks allowing operators to be completely removed from the caster floor. The entire casting process can therefore be monitored from the safety of the control room.

Individual SIMETAL LiquiRob units are employed to carry out specific duties in different working areas. From simple probe handling to more demanding functions such as ladle-shroud manipulation, all possible task combinations can be configured and adapted to individual producer requirements. This is made possible thanks to the modular system design, similar to other Siemens VAI technological packages.

Main features:
- Installation on linear rails or on rotatable platforms for maximum operational reach
- Modular design of SIMETAL LiquiRob mechatronic package according to „SIMETAL Connect & Cast“ philosophy of Siemens VAI

Main benefits:
- Maximum operator safety in liquid metal areas due to fully automatic robotic operations from start to finish of casting
- Minimum number of required multi-task robots employed, capable of performing additional future tasks
- Subsequent application of SIMETAL LiquiRob possible in nearly any caster from any supplier
- Fully customized solutions – simulation of all operational tasks in the workshop prior to installation upon customer request
Billet casting for mini mills
The perfect link between liquid steel and long rolling products

Siemens VAI’s billet casting technology precisely meets the requirements of the customer. It is optimized for integration into existing plants as well as for implementation as an integral part of a complete mini mill plant, and excels with its high productivity, high reliability and short start-up times.

The name “mini mill”, which originally denoted smaller, locally focused capacities, has now long been synonymous with high performance, economy and flexibility. With a thriving steel market, electric mini mill steel plants have established themselves as the most efficient alternative to the converter steel plant. We are able to support you with extraordinary technological expertise in mini mills.

Continuous billet casting
To the large extent the speed, throughput and flexibility of a mini mill are determined by the continuous casting billet line. Modular continuous casting systems from Siemens VAI enable steelmakers to meet production requirements precisely in every detail, and to readily implement future changes. Our customers can rely on industry-leading casting technology. And a complete range of available services ensures competitive performance throughout the entire life-cycle of your line.

Experience backed by numbers:
• More than 250 installed electric arc furnaces and ladle furnaces worldwide
• More than 100 installed or upgraded dedusting systems
• More than 1,300 installed or upgraded continuous casting strands
• More than 400 installed or upgraded long product rolling mills

4-strand billet caster at Valsugana, Italy
Our life-cycle management revolves around proven project management. We work in close collaboration with you to develop the best possible solution based on your specific requirements. You can trust on our experience from over 1,800 successfully completed projects around the world.

Our modern planning tools lead to a logistically perfected greenfield plant. Or, with often small modifications to your existing plant we create unrealized optimization potential to generate maximum profit in the future. No matter how complex the projects, they are implemented on schedule and with the shortest possible start-up time.

Closer through worldwide presence
In our customer relationships, we identify ourselves with each customer project in a way that is unsurpassed worldwide. Our on-site project teams work perfectly together, and are strongly rooted in the respective markets. They’re familiar with local market conditions, as well as with the language and culture of each region. Online data management enables a fast, worldwide exchange of knowledge and experience. And our project manager forum makes sure that experience and results from individual projects are forwarded and shared.

Our employees are supported by an integrated apprenticeship and training program right from the start. You receive the knowledge and also the experience needed for successful caster projects.

Future oriented technologies
Our automation systems include the market-leading SIMATIC S7 and user-friendly interface SIMATIC WinCC. With an upgrade to the current SIMATIC PCS 7 system, you receive access to many new control functions. In addition, a broad range of services is available for the perfectly coordinated optimization of your plant. For example, that’s how our qualified service employees are able to deliver core components just-in-time, such as oscillators, withdrawal and straightening unit, spray headers and molds – allowing you to flexibly and quickly react to changing market conditions with no downtimes.
Strongly increasing demands on product quality and lower-cost production force billet producers to constantly seek equipment improvements and more efficient casting operations. At a certain point, this adaptation cannot be done by the operators themselves in the course of normal maintenance, and a comprehensive review has to be considered. Generally, these targets fall into one of the following categories:

• Decreasing operation costs (energy, maintenance and consumables, operation personnel)
• Improving of product quality (internal quality, surface)
• Extending the product mix in terms of steel grades and dimensional range

Siemens VAI has vast experience in upgrading and modernizing of billet casters. With a systematic approach, we work closely with our customers to develop a tailored modernization concept based on their individual needs, taking all boundary conditions fully into account.

The solution may be purely electrical, automated, mechanical, or a combination of all three. Based on the selected concept, the modernization can be carried out in several steps or during a caster shutdown.

Siemens VAI’s experience minimizes down times and ensures a fast production start-up and top quality.

**Manufacturing network**

We manufacture core components and selected equipment in our own manufacturing centers and workshops. These are located across the globe in close proximity to our customers in Brazil, China, France, Germany, India, Mexico and the U.S.A. In this way, we ensure that the highest standards of quality are met during all phases of the project, beginning with production planning and selection of materials, to component manufacture, assembly and corrosion protection, up to workshop testing and dispatch.

Siemens VAI workshops and factories are certified and each meets the same high international standards for products and production (ISO 9001:2008), labor safety (ISO 18001:2007), and environmental compliance (ISO 14001:2004). This allows us to optimize the workload balance and production scheduling to reliably meet strict delivery times.

Prior to shipping, components and equipment are preassembled in the workshop to the maximum extent possible, followed by exhaustive testing and calibration. The vertical and comprehensive supply capability of Siemens VAI, which includes mechanical equipment, electrics & automation systems, technological packages and mechatronic solutions, is the basis for short installation times, fast start-ups and reliable fulfillment of the guaranteed performance specifications.
Continuous improvement of the casting processes is mandatory to meet rapidly increasing quality and productivity requirements. With Siemens VAI Caster Technology Consulting you will be able to reach and even surpass your highest casting expectations by identifying and eliminating billet caster deficiencies and weaknesses.

Caster Technology Consulting from Siemens VAI stands for expertise in quality improvement, numerical simulation, and special component design. In order to provide the ideal solution to meet the specific requirements of each producer, we can call on our disposal caster experts and access our comprehensive metallurgical and operational database. By taking even small steps towards a solution, you can achieve dramatic improvements in cost-effective and reliable production. The Caster Technology Consulting comprises services as follows:

Caster fitness check
This fitness check is comprised of two modules: An online questionnaire is first completed by the customer in advance of a visit. That’s followed by a thorough on-site evaluation of the plant by Siemens VAI experts. Weak spots are identified in the casting process in addition to the installed equipment and systems.

Elaboration of study and presentation of results and proposals
Plans for a detailed investigation are discussed with the customer and areas of deficiency are addressed with proposals for solutions as well as a presentation of the expected costs and benefits.

Overview of consulting competences
All Siemens VAI consulting services are based on decades of experience in the engineering, installation, start-up, and commissioning of billet casting machines worldwide. Quality improvement, simulations, and component design is the mainstay of Siemens VAI’s consulting services.

When it comes to quality improvement, investigations usually begin with a comprehensive evaluation of all factors that have a potential effect on product quality. Statistical evaluations as well as detailed metallographic defect analyses are carried out on-site. Additional support can be provided by external laboratories and universities with which we have a long-term working relationship.

- Metallurgical investigations
- Surface-quality optimization
- Automation setup optimization
- Technological training
- Internal quality improvements
Real time simulations for a deeper insight
Thanks to the enormously expanded computer capacity and improved software algorithms, our technologists can simulate even complex processes and conditions in real time. Advanced simulation models make it possible to acquire a deeper insight into the steel-solidification process.

- Finite element method
- Computational Fluid Dynamics
- Thermomechanical simulation
- Equipment quality simulation
- Thermodynamic simulation
- Experimental simulation

Replacement solutions and development of special components
To eliminate the weakest links in the process chain, our experts can propose effective replacement solutions and develop special components to enhance the machine availability. That way, we can help you meet the increasing market demands regarding new steel grades and product dimensions.

The installation of long-lifetime components will also significantly reduce maintenance expenditures. Solutions and services can be implemented in casters of any supplier.

- On-site plant analysis and optimization
- Customized engineering solutions
- Equipment failure analysis
- Laboratory spray-nozzle testing
- Equipment check

Main benefits:
- Major improvements in productivity, process stability, product quality and yield
- Immediate support
- Worldwide references that also include non-Siemens VAI-supplied billet casting plants
- Comprehensive technological training
- Proven fast return on investment (ROI)
Decades of experience reflect our expertise, especially in the field of billet casting, where increased productivity, higher capacity, lowered operating costs and reducing emissions count more than anything. These are results with which our customers can measure their success – and ours as well. Have a closer look at our successful projects, and see for yourself how we could help you.

Expertise from experience – Selected success stories with billet caster technologies

- New billet casters with 430 strands
- Revamped billet casters with 363 strands
### New billet casters – 12 strands to boost production

**Customer:** Steel Authority of India, IISCO Steel Plant, India  
**Type of plant:** Two 6-strand billet casters  
**Our solution:** The new casters include advanced design features such as butterfly ladle turrets, cantilever-type tundish cars, nozzle-changing devices for open stream casting and stopper rods for submerged casting, SIMETAL DynaFlex hydraulic oscillators, SIMETAL DiaMold high-speed tube molds, electromagnetic mold-stirring systems, Level 1 and Level 2 automation systems.  
**The result:** Production of 1,710,000 t/a of rebars and high-quality steels, high-carbon, cold heading, spring steel, electrode-quality and alloyed-construction steel.

### New billet casters – 8 strands for highest productivity

**Customer:** Shandong Laigang Yongfeng ISCO, Jinan, PR China  
**Type of plant:** 8-strand billet casters  
**Our solution:** The machines are equipped with SIMETAL DynaFlex mold oscillator for optimized billet surface quality. SIMETAL DiaMold tube ensures high-speed casting of 150x150 mm with a possible extension to 180x180 mm. Electromagnetic mold-stirring systems (EMS) in the mold area ensure a fully homogenized steel composition with minimum centre segregation.  
**The result:** Production of 1,600,000 t/a of carbon, alloyed, stainless and silicon steel grades.

### New billet casters – state-of-the-art technology

**Customer:** IRO, Industrie Riunite Odolesi, Odolo, Italy  
**Type of plant:** One 4(5)-strand billet caster  
**Our solution:** The machine is equipped with SIMETAL DynaFlex oscillators for the flexible adjustment of the mold oscillation parameters as well as with SIMETAL DiaMold high-speed casting molds. The run-out-area is designed for hot charging of billets to the rolling mill.  
**The result:** Production of 800,000 t/a of rebars.
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