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## **CONTINUOUS SLAB CASTING SOLUTIONS**

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# YOUR CHALLENGE

## TO REACT QUICKLY AND FLEXIBLY TO MEET MARKET REQUIREMENTS

### THE MARKET DEMANDS A LOT.

Today continuous casting accounts is the leading technology used to convert steel from a molten into a solid form. Parallel to its enormously rising significance, the quality of the continuously cast product has been constantly rising since its introduction in the late 1960's. At the same time the requirements for plant availability, flexibility and safety standards for the employee have also increased. In the process itself, casting speeds have been rising and the spectrum of possible dimensions and materials have been expanding continually. Fully dynamic, automatic and flexible adjustments of machine parameters for the production of high quality steel products can often no longer be achieved with older continuous casting plants. In the intensely competitive environment of the steel industry, a high degree of flexibility, product quality and customer orientation is absolutely essential for lasting success. That's why the majority of steel producers are seeking cost-efficient solutions for optimizing their plants so that they can meet the demands of competition. Are you seeking the same?

### HOW WELL ARE YOU PREPARED?

Or in other words, does your current continuous casting plant fulfill the requirements of you and your customers' for modern production when it comes to quality, flexibility and reliability? Have you already calculated how much time you lose when changing products? Or asked yourself how much value you place on the safety of your production and employees? You haven't? Then now's the time to do so. The decisive factor for optimizing the continuous casting process is technological knowledge, developed over five decades and integrated to ensure an optimum solution. Our technological solutions focus on the decisive points that determine quality and economy. This applies especially in regard to the modernization of existing plants. The more flexible and productive your continuous casting machine, the more you can boost your performance in the market. We invite you to design your future with Primetals Technologies, the market leader for continuous casting plants, work with us in meeting the growing demands of the market.

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The market requirements in the steel industry are continually increasing. Today increased productivity with a high standard of quality and excellent plant availability are a competitive advantage. Faster throughput times and high flexibility in production require increased safety standards for the environment and the employees.

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## YOU EXPECT ...

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- Higher productivity and improved flexibility from your continuous casting plant using market relevant innovations.
  - The complete expertise of the market leader in continuous casting plants – including the entire steel production process, as well as metallurgical, mechatronic and automation knowledge – all from a single source.
  - Modular and highly efficient technological packages, which meet your individual requirements.
  - Lifecycle service that offers professional training of your employees and covers everything from in-house spare part to continuous technology updates.
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# YOUR CHALLENGE

## OPTIMUM CAST PRODUCT IN THE SHORTEST TIME

### EXPERTISE FROM A SINGLE SOURCE

If there's anyone who receives top priority from us, then it's you, as our customer with unique requirements and desires for the future of your continuous casting plant. We have comprehensive expertise covering the entire steel production process, as well as metallurgical, mechatronic and automation knowledge, that is simply unique worldwide. Profit from our full line expertise that after 50 years and more than 400 slab caster references has made us the market leader. There's just one question to answer: In precisely which ways can we help you?

### MODULE OR COMPLETE PACKAGE

That is the question - and our answer. We can offer our customers precisely defined, modular technological packages to meet their specific requirements. Those requirements might be for a new plant or the modernization of an existing one. It's your choice, and we will work together with you to decide which solution is in your best interests.

### PUTTING OUR INNOVATION TO WORK FOR YOU

The name Primetals Technologies stands for leadership in innovation. We've established a decisive competitive advantage in the area of metallurgy and process knowledge. The crucial point: Our innovations are directly relevant to the market. After all, we not only know which technology you need as a plant operator, but also which product qualities your customers need and expect. We therefore invite you to work with us in applying our innovative strength to optimizing your continuous casting production.

### SERVICE ORIENTATION

We'd like to give you some specific examples of what we mean by service. Our service expertise includes capacity analyses and feasibility studies in advance of projects and coaching of your employees, as well as in-house spare parts production and continuous updating of technology. Not to mention our long-term customer specific Primetals Technologies consulting to help improve your plant's production performance. Everything we do is with one goal in mind - to help you achieve the most economical solution throughout the entire life-cycle of your plant.

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The economy is rapidly changing each day and becoming increasingly difficult to anticipate. Keeping up with these demands requires optimized, flexible solutions for your plant. By working in close collaboration with our customers, that's exactly what we at Primetals Technologies deliver.

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## **GOOD REASONS FOR CHOOSING PRIMETALS TECHNOLOGIES SLAB CASTING SOLUTIONS**

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- You're always technically on the cutting edge thanks to the metallurgical experience and technological expertise.
- A modular approach makes it possible to create flexible solutions, whether for a small component upgrade or a turnkey project.
- Always on time - our worldwide project management experience and Connect & Cast® expertise enable ideal project development right up to the perfect plant start-up.
- We are your dependable partner -our support continues beyond the start-up to include the entire life-cycle of your plant.

### **DID YOU KNOW,**

- that on a Primetals Technologies slab caster you don't have to reduce the casting speed to change the product width during the production process?
  - that Primetals Technologies achieves the shortest revamping times combined with return to full production? For example: Posco Gwangyang in Korea where the plant returned to full production after just 13 days.
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# SLAB CASTING TECHNOLOGY

## INNOVATIVE STRENGTH FOR MAXIMUM PRODUCTIVITY

**We've been leading innovators right from the start. In the field of slab casting technology, Primetals Technologies has implemented numerous pioneering developments in the past, including straight mold design, continuous bending and straightening, small roller pitches, dynamic secondary cooling as well as integrated quality control systems.**

Today these are standard elements in all advanced slab casting machines. As the result of our continuous focus on research & development and implementing innovative technological packages, Primetals Technologies has become the world market leader in slab casting technology.

### **REVAMPING AT ITS BEST**

Through the use of mechatronic technological packages we achieve the shortest revamping times and extremely rapid start-ups with modernization steps for increasing productivity. Our expertise translates into flexibility through rapid format change and excellent product quality (DynaWidth, DynaGap SoftReduction®). With our Connect & Cast® principle, we support our customers during the project phase, through the integration phase, and into full production, and beyond thanks to our life-cycle management services.

With our sophisticated, proven products for example: SmartMold, the DynaFlex- Oscillator and the Smart® Segment, we have the leading solutions for every application. Reproducible results guarantee a high degree of process reliability, and our thoroughly tested and configured special automation solutions with simple operating panels ensure safe and reliable production.

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Single stainless slab  
caster, Outokumpu,  
Tornio, Finland





Single strand slab caster, voestalpine Stahl, Linz, Austria

### SCOPE OF SUPPLY AND SERVICES

- Slab casters, Bloom, Beam blank
- Combi casters (single, twin and triple)
- Medium/thin-slab casters
- Casting and direct rolling
- Endless strip production (ESP)
- Special casters (e.g. vertical casters)
- Caster upgrading
- “Rapid action” spare-parts supply
- Engineering and feasibility studies
- Construction site management
- Operational and metallurgical assistance
- Start-up assistance
- Metallurgical “hot-line” service team
- Turnkey project implementation
- Process automation and quality control Expert operational training assistance After-sales service
- Innovative financial engineering

### A STAINLESS REPUTATION FOR EXCELLENCE

Primetals Technologies is the clear world market leader in the field of stainless slab casting. Standard elements of all Primetals Technologies slab casters include SmartMold with DynaWidth hydraulic width adjustment, DynaFlex Oscillator, SMART Segment with DynaGap SoftReduction, as well as integrated automation and quality control systems.

### MAIN BENEFITS SLAB CASTING

- Top quality and productivity at increased yield
- Connect & Cast packages ensuring fast ramp-ups
- High flexibility with regard to product width & thickness

### STAINLESS STEEL

- High-end product quality maintained at top casting speeds
- Large operating window for steel grades
- Top yield

### DID YOU KNOW

- that 400 mm thick slabs can be produced on bow-type casting machines?
- that straight molds can be fitted onto machine where bent molds were previously used?
- Primetals Technologies supplies the most sophisticated process models in the steel market?



- 1 Ladle turret
- 2 Tundish car
- 3 SmartMold with DynaWidth-adjustment MoldExpert LevCon
- 4 DynaFlex oscillator
- 5 Smart® Segment with DynaGap SoftReduction® Dynacs 3D

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Compact and modularly designed slab casters from Primetals Technologies feature the world's most advanced technological packages and special casting equipment and components.



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# SLAB CASTER TECHNOLOGIES AND PRODUCTS

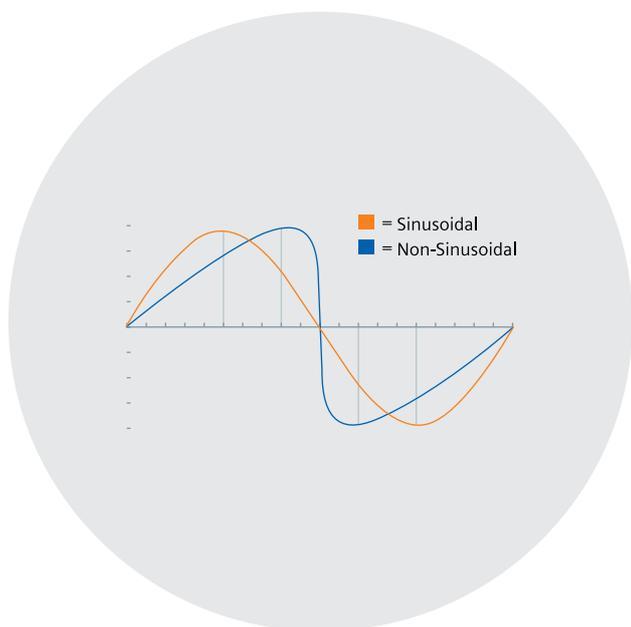
## INDIVIDUAL PACKAGES FOR OPTIMIZED OPERATIONS

**The decisive factor in the optimization of the continuous casting process is our technological knowledge and experience, acquired in over five decades and integrated into our products.**

Our technological solutions focus on the decisive points that determine quality and economy. When it comes to modernization of existing plants, today the boundaries between products and services are no longer clear defined. Conventional services and delivery have to be flexibly combined with the installation of new plant parts. That's why Primetals Technologies offers precisely defined modular technological packages to exactly meet your individual needs.

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DynaFlex - Hydraulic  
oscillator control for  
improved strand-surface  
quality



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# CONNECT & CAST AUTOMATION

## UNLIMITED AUTOMATION EXPERTISE AT YOUR DISPOSAL

**Today more than ever, the market sets the conditions – for short delivery times, flexible lot sizes, competitive prices and ensured quality. We respond with shorter throughput and preparation times, cost minimization, innovation and higher productivity. Our automated technology lets you meet even the most complex requirements.**

### **TOTALLY INTEGRATED, TOTALLY EFFICIENT**

Primetals Technologies provides a comprehensive, integrated range of products and systems for efficient automation of the entire production workflow. It enables the realization of perfectly tailored automation solutions to meet all individual production requirements. Thanks to the uniquely integrated qualities of our automation packages, companies are able to optimize their production processes, accelerate time to market and reduce production costs. It also provides a high level of investment security while minimizing overall project complexity.

Backed by comprehensive metallurgical, engineering and operational expertise, Primetals Technologies automation experts excel in the design and integration of advanced automation products which result in major improvements in caster performance, product quality and operational reliability. Modularly designed and expandable software packages are available for both new and existing casters. Customer support, including system maintenance, upgrades and troubleshooting, can be provided by our worldwide network of Primetals Technologies automation branch offices or via remote data links.



# OUR SLAB CASTING SERVICES

## PROJECT SUPPORT FROM A MARKET LEADER



### PROJECT MANAGEMENT WITH A FUTURE

**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. Primetals Technologies offers you our experience from over 400 successfully completed slab caster projects worldwide.**

Our modern planning tools lead to a logistically perfected greenfield plant. Or, with often small modifications to your existing plant we can create unrealized optimization of potential to generate maximum profit in the future. All such complex projects are implemented on schedule and with the shortest possible ramp-up time.

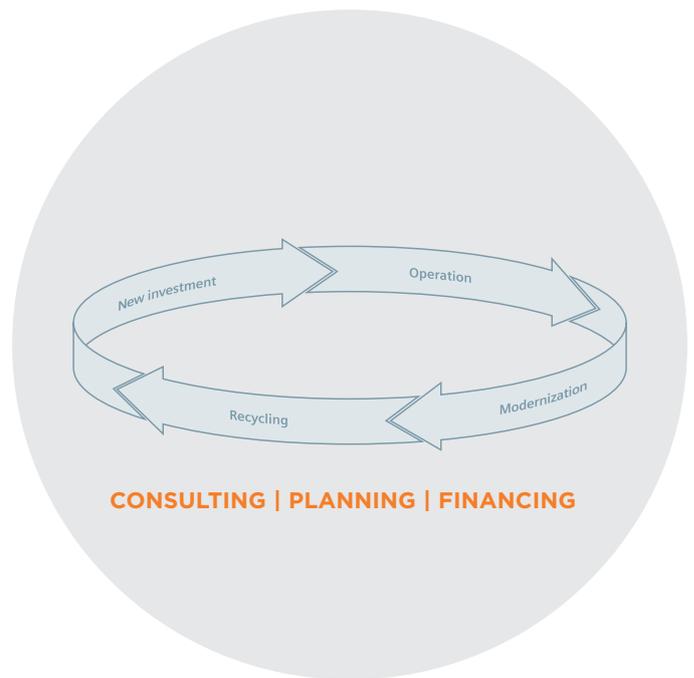
In our customer relationships, we identify with each customer project in a way that is unsurpassed worldwide. Our on-site project teams work perfectly together, and are strongly rooted in the respective markets. They're familiar with local market conditions, as well as with the language and culture of each region.

Our project management is certified to ISO 9001: 2000 and standardized, so that we can develop all project levels transparently and in an organized manner. An 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 a successful caster project.

### WE OFFER YOU A BROAD SPECTRUM OF SERVICES

Three thousand service employees from around the world have the knowledge and experience to meet your totally specific operational requirements. From the delivery of a simple spare part through to the modernization of plant components, from training of customer personnel through to assumption of outsourced maintenance services, from technological update of your processes to individual automation packages, and from hardware to software solutions - we offer you the complete package of customer services, perfectly coordinated for the optimization of your plant.

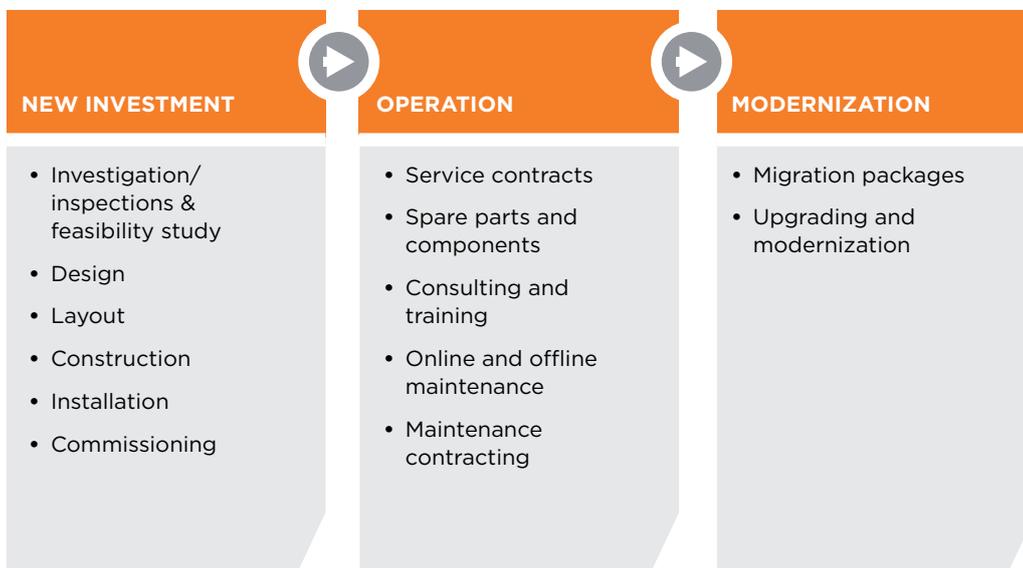
# LIFE-CYCLE MANAGEMENT PARTNERSHIP NEVER ENDS



## PRIMETALS TECHNOLOGIES LIFE-CYCLE SERVICES

As a plant operator, you have conflicting needs. On the one hand, your performance is measured each quarter against short-term profitability expectations. On the other hand, you have to think on a totally different timescale compared with the capital market. Depending on the lifetime of your plant, you have to take 15 years or more into account.

But thanks to our comprehensive expertise and integrated approach to solutions, you benefit both short-term and long-term from our life-cycle services. In the short term: Backed by our extensive experience with many reference plants, we provide you with the certainty of fast, dependable production start-up and shorter amortization periods. In the long term: Our master plan guarantees competitive performance for your plant in every phase of its life-cycle. Whether we're providing 24/7 technical support, optimizing maintenance, or making permanent plant improvements, we're always working to ensure the cost-effective operation of your plant.



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# EXPERTISE FROM EXPERIENCE

## SELECTED SUCCESS STORIES WITH SLAB CASTING TECHNOLOGIES

Numbers reflect our expertise. Especially in the field of slab casting, where increased productivity, higher capacity, lowered operating costs and reducing emissions count more than anything else.





**Primetals Technologies Austria GmbH**

A joint venture of Mitsubishi Heavy Industries and partners

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