

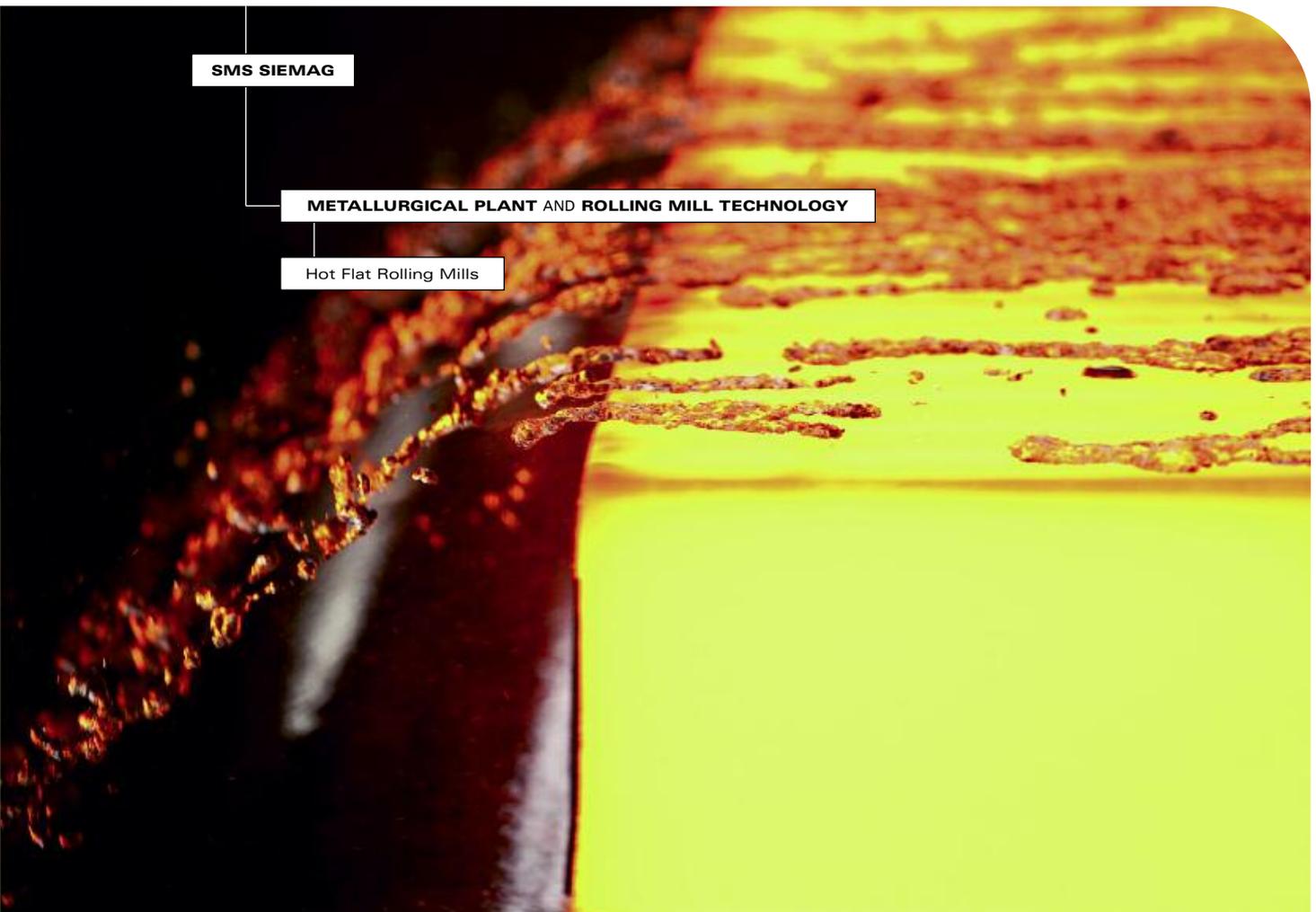
## DESCALING TECHNOLOGY

for high-quality surfaces

SMS SIEMAG

METALLURGICAL PLANT AND ROLLING MILL TECHNOLOGY

Hot Flat Rolling Mills



# OUR MISSION:

## High surface quality

Effective removal of the scale which forms on the slab during the heating-up and rolling processes is a decisive prerequisite for the production of strip or sheet with a perfect surface finish. With more than 140 descaling units installed in hot strip mills, heavy plate mills, CSP® plants and Steckel mills, SMS Siemag is the global leader in descaling technology. In order to provide steel manufacturers with even more efficient solutions, SMS Siemag focusses on the further development of its descaling technologies. Today, the focus lies especially on the increased demands on surface quality, new steel grades which are difficult to descale and the reduction of energy consumption and maintenance costs.

### DESCALING TECHNOLOGY FROM A SINGLE SOURCE

As an integrated systems supplier, SMS Siemag provides complete descaling units including pump stations and electrical and automation systems. Thanks to this integrated package, all components are matched in a targeted manner. That is why excellent results can be achieved. Furthermore, SMS Siemag supports its customers throughout the entire life cycle of the plant, from conception and design right through to construction and commissioning of the equipment as well as by offering comprehensive service, training and testing facilities.

### TECHNICAL DATA

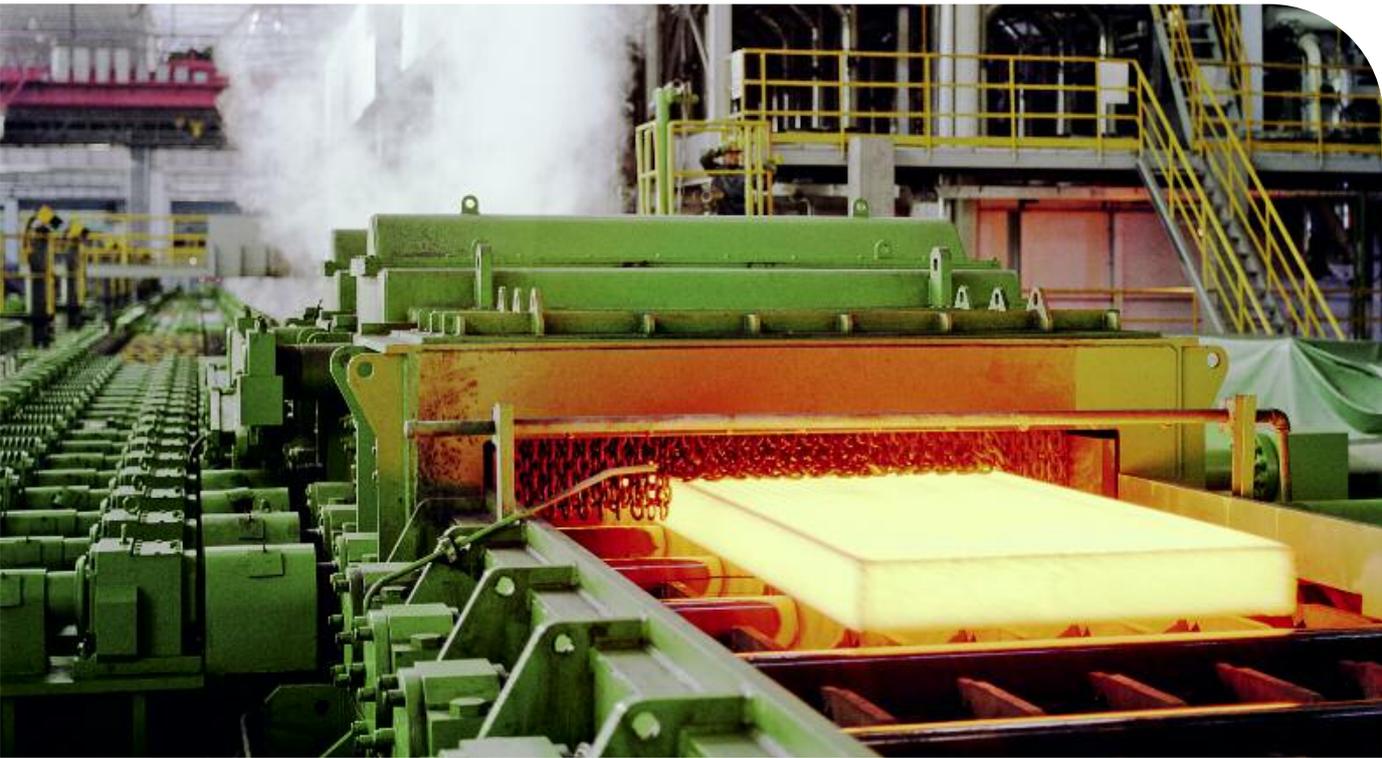
Plant type	Carbon steel	Stainless steel grades	Special steel grades	References
Heavy-plate mill	190 bar	190 – 235 bar	400 bar	22
Hot strip mill				
- Roughing mill	190 bar	190 – 235 bar		35
- Finishing mill	190 bar	Superheated steam, compressed air		35
Steckel mill	190 bar	190 – 235 bar		14
CSP® plant	190 bar	380 bar		37
Absolute consumption: 250 – 540 m <sup>3</sup> /h		Specific consumption: 2.6 – 6 l/(min* mm width)		

SMS Siemag does not treat descaling as an isolated measure but as an integral part of the process chain from continuous casting through hot and cold rolling up to final strip processing. Strips with an excellent surface quality can be produced only if well-tuned measures are taken in all process steps.

An example for this approach is IPQS® (Integrated Product Quality System). This high-performance tool for quality assurance allows for an integrated examination of plant and process data across process steps, relating them to the product characteristics.

### TYPES OF CONSTRUCTION AND SPECIAL SOLUTIONS

SMS Siemag specifically designs all equipment to suit the customer's product mix and requirements. That is why we supply descaling units that have a roll lift of more than 1,000 mm and therefore can also clean ingots. For special applications, SMS Siemag provides tailor-made solutions, such as the tornado descaler characterized by its particularly high efficiency while consuming significantly less water.



Effective descaling is the prerequisite for a perfect surface finish.



Modern descaling unit for removal of secondary scale.

## OUR ADVANTAGES

- Complete descaling unit with well-tuned components all from a single source
- State-of-the-art descaling technology for excellent surface quality at a low degree of cooling of the rolled stock
- Comprehensive service
- Low maintenance and operating costs

# OUR TECHNOLOGY

## for efficient descaling

Descaling units by SMS Siemag are characterized by the complete removal of the scale at low energy and water consumption rates and a degree of cooling of the rolled stock as low as reasonably practicable.

To provide for optimal surface cleaning, SMS Siemag only uses tried and tested state-of-the-art nozzles. The top spray headers are equipped with an hydraulic vertical adjustment system. In this way, it is ensured that the nozzles are always located at an ideal distance from the rolled stock.

In order to keep the degree of cooling of the slab or transfer bar as low as possible, the water-scale mix splashing back from the rolled stock is collected in water collecting troughs and drained. Especially designed wiper and pinch rollers as well as chain curtains ensure that adjacent plant areas are protected from the scale-breaking water and that the water only remains on the material surface for a short time. Longitudinal spraying additionally accelerates the draining process.

### PUMP STATION

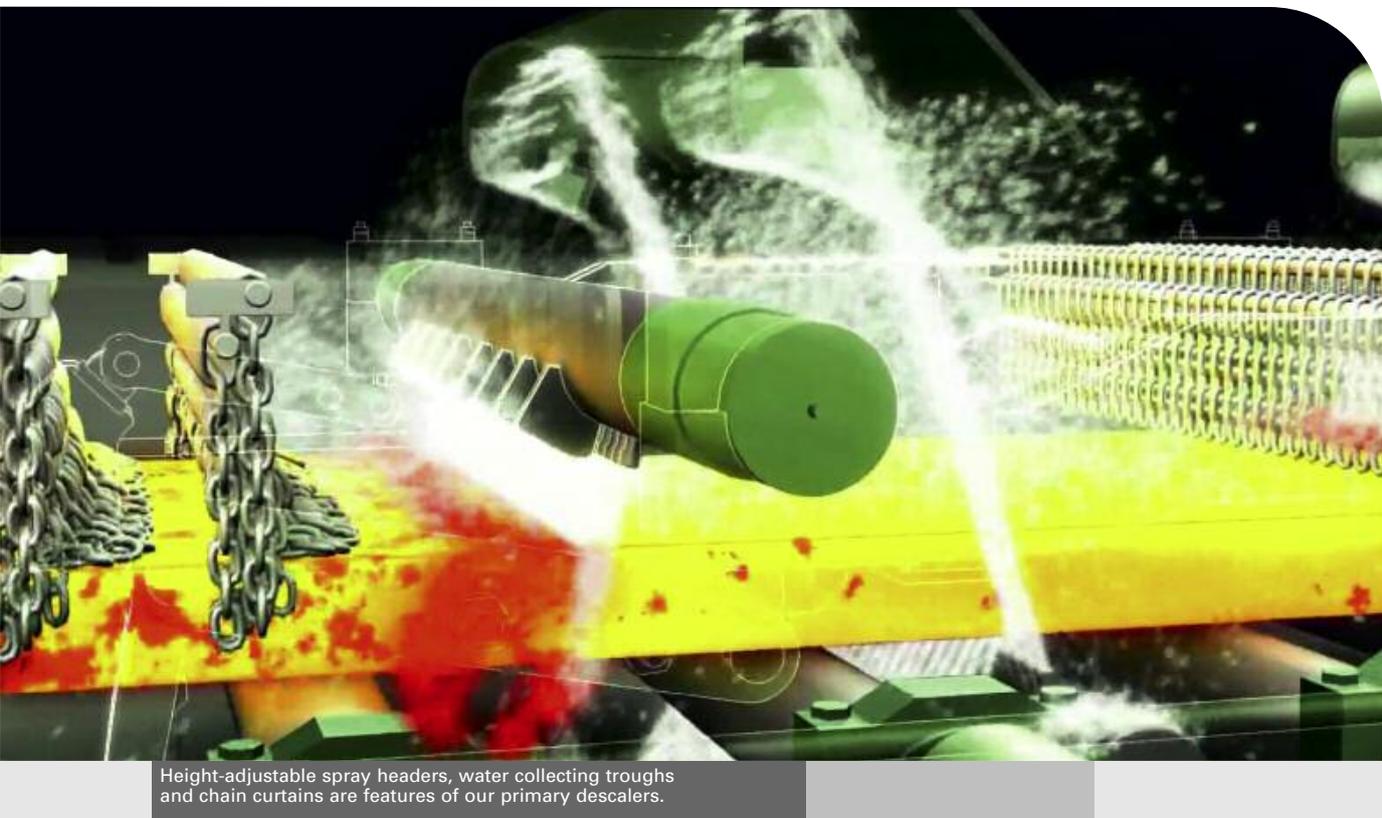
The pump station generating the compressed water is adapted by SMS Siemag to suit the time-related demand pattern of the rolling program. In this context, we attach major importance to the reliable supply of compressed water as well as on low investment and operating costs. The compressed water is generated by means of centrifugal or piston-type pumps. In the case of centrifugal pumps, the generation of compressed water can be harmonized and the number of required pumps can be reduced by installing compressed water tanks and modern valve systems. The installation of frequency controllers allows covering short demand peaks, with major energy savings during the significantly longer times during which the descaling unit is not active.

The alternative installation of piston-type pumps can involve higher investment costs, which however often pay back after less than two years thanks to the energy savings. Piston-type pumps can be operated without compressed water tanks and can also be installed at a later point in time in existing hot rolling mills. Pressure surges and pulsations are reduced by means of a sophisticated absorption system and therefore cannot cause any damage. The flow-optimized routing of the pipelines reduces pressure losses and pipe damage.

Due to the high pressure values and especially due to the stresses resulting from cavitation, descaling valves usually require extensive maintenance. Together with Dr. Breit GmbH, SMS Siemag has developed a new descaling valve, which helps to prevent damage resulting from cavitation thanks to its improved design. The targeted pilot-control of the valve opening reduces the pressure surge and the loads imposed by it.



The newly developed, simulation-optimized descaling valve prevents damage resulting from cavitation.



Height-adjustable spray headers, water collecting troughs and chain curtains are features of our primary descalers.

## AUTOMATION

As a full-line systems supplier, SMS Siemag integrates the entire descaling unit into its X-Pact® electrical and automation systems, which are tailor-made to meet the requirements of metallurgical plant and

rolling mill technology. The high degree of automation means that fewer personnel are required to operate the plant. Furthermore, remote monitoring can be implemented by means of which the process can be optimized particularly during the commissioning phase.



The design of the pump stations especially focusses on low investment and operating costs.

## OUR ADVANTAGES

- Clean surfaces thanks to effective descaling for all materials - Minimum degree of cooling of the rolled stock
- Low water and energy consumption
- High reliability and safety of operation
- Fewer interfaces thanks to proprietary automation

# YOUR PARTNER

## for all challenges

### INTELLIGENT DESIGN

SMS Siemag attaches great importance to designing descaling units which are easy to maintain. Parts subjected to particularly heavy loads are generally manufactured from wear-resistant materials. The simple replacement of parts allows for short down-times within the scheduled maintenance intervals. In this way, for example the spraying header can be dismantled easily by means of a patented high-pressure coupling. The same applies to the hood, which is dismantled together with the top water collecting troughs.

Also with regard to setting up the pump station, flexibility is a key aspect for SMS Siemag. Depending on the available space and the customer's requirements, SMS Siemag selects the matching systems and configurations.

### STRONG SERVICE

Together with its customers, SMS Siemag develops solutions for steel grades which are difficult to descale. In the process, SMS Siemag is able to test various systems, arrangements and settings in their own laboratory using original samples. Furthermore, new systems can be tested in pilot trials on site.

With the X-Cellize® service, SMS Siemag also is the competent partner for all challenges faced while operating the descaling units. SMS Siemag offers a wide range of maintenance and inspection services, spare parts supply and training and contributes comprehensive process know-how. Thanks to the worldwide service network, SMS Siemag experts are always close to the customer.



SMS Siemag offers services for the entire rolling mill.



Descaling unit with 1,000 mm roll lift for descaling ingots.



Tailor-made solutions in an extremely restricted space: descaler with one pair of spray headers.

## OUR ADVANTAGES

- Low wear and easy maintenance of the descaling unit
- Intensive development activities with own laboratory and pilot trials on site
- Comprehensive service
- Tailor-made modernizations



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