

**ANDRITZ METALS**  
Quality and experience

# ANDRITZ METALS

Quality that brings customer satisfaction

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ANDRITZ METALS is one of the leading global suppliers of complete lines for the production and further processing of cold-rolled carbon steel, stainless steel, and non-ferrous metal strip. These lines consist of equipment for cold rolling, heat treatment, surface finishing, strip coating and finishing, punching and deep drawing, laser and resistance welding, and for pickling acid regeneration. ANDRITZ METALS also supplies turnkey industrial furnace systems for thermal processes, such as heat treatment of slabs and forged pieces, as well as refining furnaces for the copper industry.

### Competence from a single source

ANDRITZ METALS is one of the few single-source suppliers worldwide capable of providing all technologies and processes involved in the manufacturing of steel strip on a comprehensive basis (mechanical, process, electrical equipment and automation as well as life cycle services). This ensures interface minimization as well as consistent optimization of the overall process. ANDRITZ METALS offers future-oriented technologies in the cold rolling, thermal treatment, and surface finishing market segments. All required processes come from one supplier – from engineering to start-up. The performance packages cover complete lines as well as special machines (e.g. for leveling processes).

### Quality that brings customer satisfaction

The companies belonging to ANDRITZ METALS utilize the synergy effects of the group to the benefit of their customers and deliver machines and lines of highest quality and highest operational efficiency.

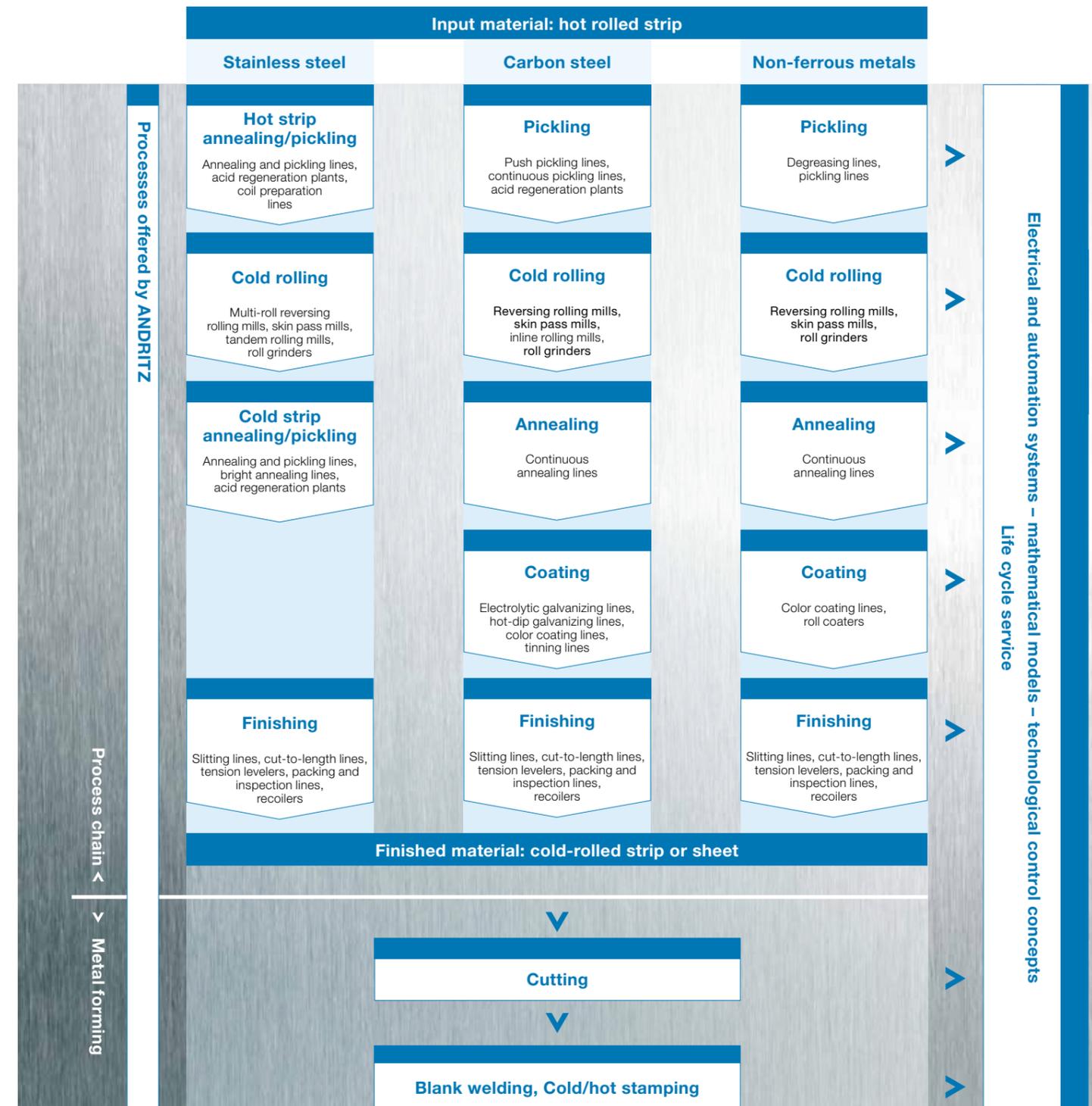
### ANDRITZ METALS, a business area of the ANDRITZ GROUP

The ANDRITZ GROUP is a globally leading supplier of plants, equipment, and services for hydropower stations, the pulp and paper industry, the metalworking and steel industries, and solid/liquid separation in the municipal and industrial sectors. The publicly listed, international technology Group is headquartered in Graz, Austria, and has a staff of around 23,700 employees. ANDRITZ operates over 250 production sites as well as service and sales companies all around the world. The ANDRITZ GROUP ranks among the global market leaders in all four of its business areas. One of the Group's overall strategic goals is to strengthen and extend this position. At the same time, the company aims to secure the continuation of profitable growth in the long term.

# Product overview

## Strip processing and surface treatment

Competence from a single source



# Annealing and pickling lines for stainless steel

High-capacity production lines from a single source: capacities of up to 1.2 million t/a, processing thicknesses of up to 8 mm for cold-rolled or 14 mm for hot-rolled strip, and strip widths of more than 2,000 mm

ANDRITZ METALS' market leadership in stainless steel processing equipment is based on its large offering of advanced annealing and pickling lines for hot-rolled and cold-rolled strip.

The customers of ANDRITZ METALS especially value its "single-source expertise" in this field. The product offering encompasses a variety of furnaces, degreasing and pickling processes, as well as additional mechanical components, such as inline mill stands, tension levelers, or scale breakers. All processes and components are tuned to each other, thus being extremely reliable and efficient.

## Highest production rates and largest strip dimensions

With its innovative engineering, ANDRITZ METALS has ascended to leadership in the market. Only thus has it been possible to supply lines with highest production rates or largest strip dimensions in the world.

ANDRITZ METALS can refer to production capacities of up to 1.2 million t/a, for strip thicknesses up to 8 mm for cold-rolled and 14 mm for hot-rolled strip, and strip widths exceeding 2,000 mm.



▲ Annealing and pickling line for stainless steel

## Extract from our reference list

- Acerinox Bahru Stainless, Malaysia
- Aperam Stainless, Belgium
- Baoji Titanium Industry, Co. Ltd. China
- Baosteel Group, China
- Jindal Stainless Ltd., India
- Lianzhong Stainless Steel Corporation, China
- North American Stainless, USA
- Salem Steel, India
- Shanghai Krupp Stainless, Co. Ltd. China
- Taiyuan Iron & Steel Ltd., China
- ThyssenKrupp Acciai Speciali Terni, Italy
- Outokumpu Nirosta, Germany
- Yieh United Steel Corporation, Taiwan
- Zhangjiagang Pohang Stainless Steel Co., Ltd., China



▲ 2-high skin pass mill for stainless steel, provides optimum strip flatness



▲ Annealing furnace meeting highest requirements in process technology, reliability, and maintenance



▲ Detail of a pickling section with heat exchangers

# Pickling lines and acid regeneration plants

Surface treatment technology combined with acid regeneration for a cleaner environment

## Carbon steel pickling

In addition to conventional continuous pickling lines, ANDRITZ METALS designs push pickling lines with capacities of up to 1 million t/a, and strip thickness ranges from 1.0 to 12.5 mm. ANDRITZ METALS skin pass mill stands are often integrated into the pickling lines, resulting in high product flatness. Continuous as well as push pickling lines can be equipped with special features suitable for pickling silicon steel of highest grades.

## Hydrochloric acid regeneration and production of special oxides

ANDRITZ METALS is the market leader when it comes to acid regeneration, using either the spray roasting or fluid bed process, depending on the customer's requirements. Hydrochloric acid regeneration plants, which are also constantly advancing, ensure efficient and cost-effective regeneration of acid at low power input and highest oxide quality. Based on these highly developed technologies, ANDRITZ also designs and supplies specialized systems for the production of oxides from various metal-chloride solutions, such as cobalt oxide, magnesia, and aluminum oxide.

New developments in the closed loop between the pickling process and the regeneration of hydrochloric acid can save up to 25% in energy consumption, hence reducing operating cost and environmental impact accordingly.

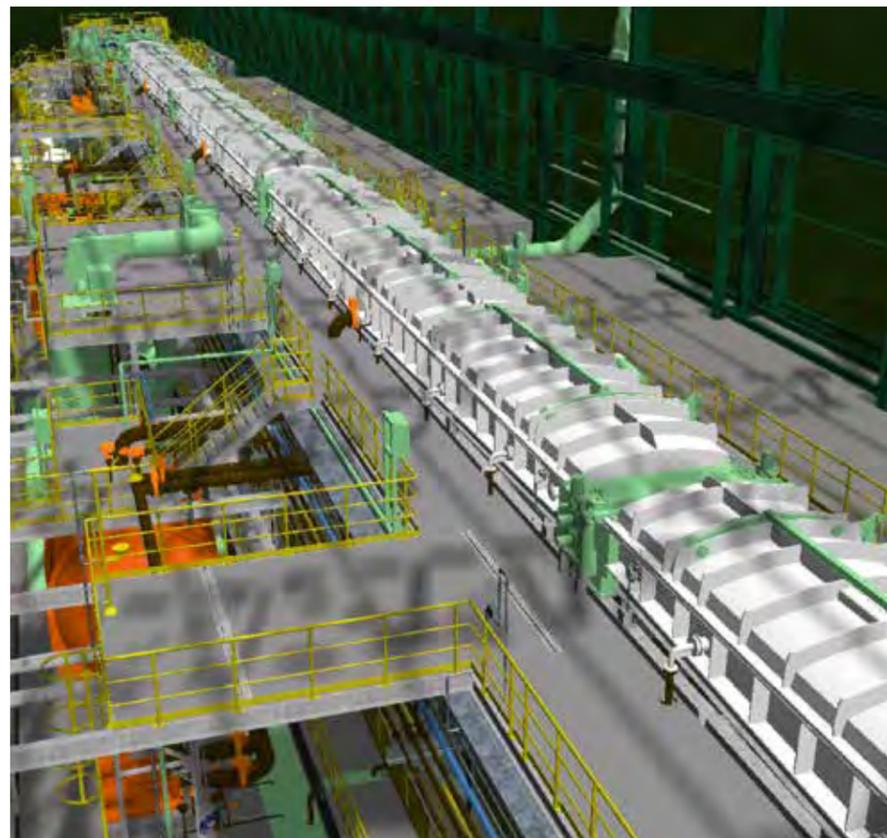
## Stainless steel pickling

ANDRITZ stainless steel pickling lines have been known worldwide since this process started to be commercialized. One main reason lies in specially developed pickling technologies for hot-rolled and cold-rolled strip. The change-over from ferritic to austenitic pickling can be implemented quickly, resulting in a smooth and cost-effective process.

A further highlight from ANDRITZ METALS solutions for stainless steel works is the DeNOx process to reduce nitrogen oxides in exhaust gases as far as possible.

## Mixed acid regeneration

The PYROMARS mixed acid regeneration technology is a mature process used in many systems throughout the world, focusing on low energy consumption, process reliability, and the recycling of acids and residual metals. ZEMAP – ANDRITZ METALS' newly developed technology transforms stainless steel mixed acid pickling into a zero-effluent process. Due to recovery of the rinse water from the rinsing section, the effluents from the pickling line are nitrate-free, and the pickling, rinsing, and acid regeneration process becomes a closed-loop operation.



▶ 3D diagram of a pickling line with acid regeneration for hot-rolled carbon steel



▲ PYROMARS reactor with DeNOx



▲ ZEMAP system



▲ Dust separator and injection of waste pickle at the evaporator of a regeneration plant for hydrochloric acid



▲ Push pickling line with a capacity of 960,000 t/a

## Extract from our reference list

- EKO Stahl GmbH, Germany
- Handan Iron & Steel Group, China
- JP Steel Plantech Co., Japan
- JSW Steel Ltd., India
- Novolipetsk Steel, Russia
- Panzhihua Iron & Steel Co. Ltd., China
- Posco Iron & Steel, Korea
- Prosperity Tieh Co. Ltd., Taiwan
- Rizhao Steel Co. Ltd., China
- Severstal Group, Russia, USA
- Thyssen Krupp Stahl AG, Germany
- Tianjin Rolling-One Steel Co. Ltd., China
- Usiminas Cubatao, Brazil
- Yieh Phui, China

# Cold rolling mills

## with 2, 4, 6, 18 or 20 rolls

Innovative technologies and customer-oriented solutions: 20-high rolling mills, high-capacity S6-high rolling mills, and inline/offline skin pass mill stands from ANDRITZ Sundwig

Thanks to its unusually broad range of cold rolling mills for strip widths from 60 to 2,100 mm, ANDRITZ Sundwig has been one of the preferred cold rolling technology suppliers for decades. The supply focuses on 2-high rolling mills, high-capacity 4-high reduction rolling mills, and inline skin pass mill stands.

### Market leader for innovative technologies

Outstanding in ANDRITZ Sundwig's portfolio is its patented S6-high rolling mill: due to their excellent features, these mills are increasingly used for stainless steel strip rolling either as inline tandem mills for cold rolling, or in the entry section of hot-strip stainless steel annealing and pickling lines to roll black hot strip with highest pass reductions and simultaneous improvement of the strip shape.

Where 20-high rolling mills are concerned, ANDRITZ Sundwig is regarded as the world market leader for innovative technologies. ANDRITZ Sundwig was the first to deliver 20-high rolling mills exclusively in a "split housing" design offering important advantages, such as quick response times by direct hydraulic screw-down, simple back-up roll configuration without eccentric, greater roll diameter ranges, and a wide opening range between the two housing halves.

### Customer-oriented design solutions

As numerous patents show, ANDRITZ Sundwig is focusing on customer-oriented design solutions. For instance, the axial shifting system (push-push), the patented impingement jet cooling system, and the patented rectangular back-up saddle design offer distinct economical

advantages. The fully automatic roll change by robot has substantially shortened rolling mill set-up times, and even more importantly, permitted contact-free roll change within the shortest time frame without damaging the rolls.



▲ Quarto/S6-high combination rolling mill for low and high carbon steels with high pass reductions



▲ 20-high rolling mill, mainly used for cold rolling of pre-rolled strip to thinnest final gauges

### Extract from our reference list

- Aperam Stainless, Belgium
- Arinox S.p.A, Italy
- Bahru Stainless SDN BHD, Malaysia
- Baosteel Iron & Steel Co. Ltd., China
- Dongkuk Industries Co. Ltd., Korea
- Jindal Stainless Ltd., India
- Jiuquan Iron & Steel Co. Ltd., China
- Lianzhong Stainless Steel Corp., China
- Luoyang Copper Co. Ltd., China
- NLMK OAO, Russia
- Outokumpu Nirosta, Germany
- Taiyuan Iron & Steel Ltd., China
- voestalpine Stahl GmbH, Austria

► Roll assembly



# Annealing and coating lines for carbon steel

Hot-dip galvanizing lines, continuous annealing lines, electrolytic galvanizing systems, and strip coating lines

Both the automotive and construction industries are facing strongly increasing requirements for production quality, quantity, and cost reduction. This means that production lines have to deliver ever higher product quality, less scrap, and higher production rates, while consumption of resources is to be reduced. ANDRITZ METALS offers the solution.

## Single-source competence

For hot-dip galvanizing lines and continuous annealing lines used in the manufacture of e.g. car body sheets, ANDRITZ METALS also follows the “single-source” concept. The plant components are precisely tuned to each other. The heart of these systems is the furnace. Here, ANDRITZ Sela has played a leading role in the market for many years, confirming this role with constant innovation. Systematic development work includes the DFF technology, which allows ever higher adjustment precision for the furnace atmosphere and the heat input. With this technology, even high alloyed carbon steel can be coated optimally in the galvanizing bath; additionally, nitrogen oxide emissions are kept extremely low and the most stringent environmental requirements are fulfilled.

## The ANDRITZ GRAVITEL process

The GRAVITEL process developed by ANDRITZ for electrolytic galvanizing systems has met with worldwide acceptance: currently, over 30% of electrolytically galvanized products worldwide are produced using GRAVITEL lines. High flexibility when changing from one product to another and high surface quality are typical advantages of this process.

ANDRITZ strip coating lines are known



▲ Hot-dip galvanizing line ▶

for their optimized line configuration, easy accommodation of product and color changes (minimized changeover times) – all this with a paint coating accuracy of 1µm.



▲ Looking into a GRAVITEL cell in an electrolytic galvanizing line

## Extract from our reference list

- AK Steel, USA
- ArcelorMittal, Luxembourg
- Baosteel Iron & Steel Co. Ltd., China
- Benxi Iron & Steel Co. Ltd. China
- Chang-Fa, China
- I/N Kote, USA
- Ornatube, Taiwan
- Pre Finish Metals, USA
- Salzgitter AG, Germany
- Thyssen Stahl AG, Germany
- voestalpine Stahl GmbH, Austria
- Wuhan Iron & Steel Corp., China
- Yieh Phui, China



## Finishing lines

Precision for highest demands in mechanical engineering: coaters, tension levelers, and scale breakers

As a traditional supplier of industrial plants, ANDRITZ Sundwig has many years of experience in manufacturing special components. All precision-built machines (coaters, tension levelers, precision levelers, scale breakers, etc.) are developed, engineered, and assembled in its workshops in Hemer, Germany – the only way to ensure that the high mechanical demands on these machines are met.

hot-dip galvanized strip or aluminum strip, mainly as protection against corrosion or preparation for downstream painting. ANDRITZ has developed different coaters – vertical, horizontal or S-type – specifically for each application. Applied with chem coaters, prime coaters, or finish coaters, ANDRITZ coating technologies are renowned across the world.

### Tension levelers

The importance of tension leveling is rising in step with the increasing quality demands for strip shape. ANDRITZ METALS has ac-

cepted this challenge and accelerated development work on these lines. Only by precisely matching the tension and bending of the strip is it possible to fulfil the most exact shape requirements for steel, aluminum, copper or brass strip.

ANDRITZ Sundwig knows how to achieve such results and supplies tension levelers as an inline solution or as an independent dry or wet line.

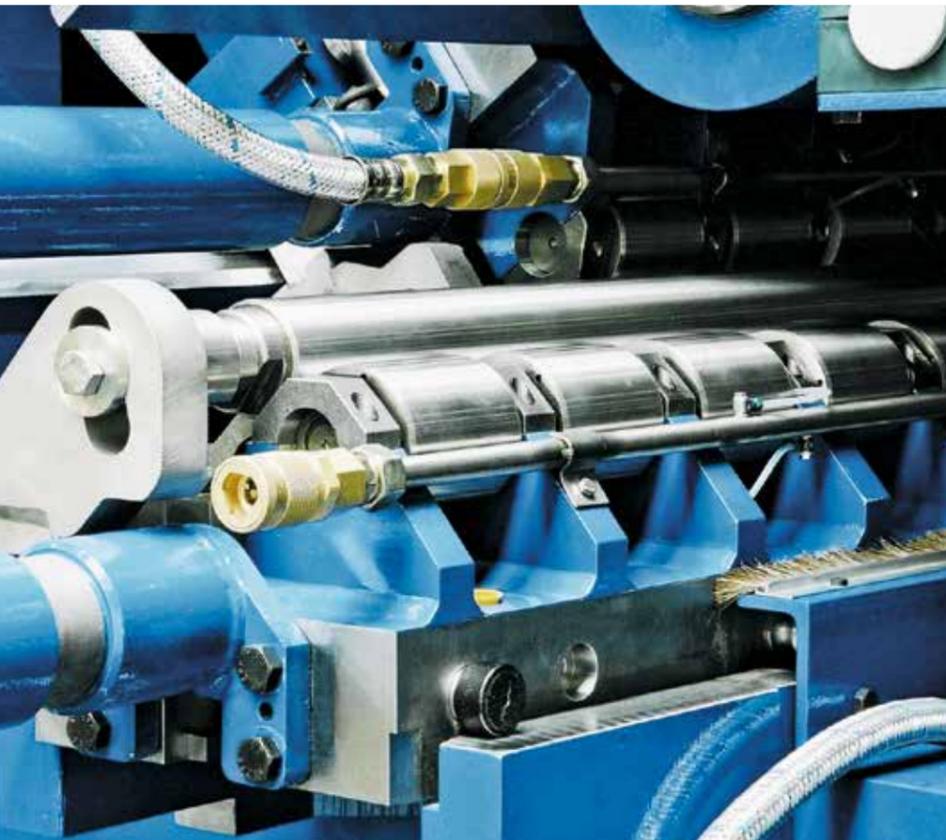
### Scale breakers

A particularly resistant scale layer is typical of hot-rolled and subsequently annealed strip. In order to prepare the strip surface for thorough pickling, the strip is conditioned by breaking the scale mechanically using a selective tension and bending effort. Downstream pickling treatment can then remove the scale more quickly and evenly. ANDRITZ METALS has developed a very efficient system providing optimum surfaces. ANDRITZ scale breakers are also particularly suitable for retrofitting into existing lines and have been used successfully worldwide.

### Coater

This technology is applied in treating the surface of electrolytically galvanized and

▼ Injection of sealing air in scale breaker and tension-leveller



▼ Strip surface quality control in the inspection line



## Shear lines for slitting, side trimming, and cut-to-length lines

The challenge: precision, flexibility, and economic efficiency. More than 300 plants supplied worldwide are confirmation of ANDRITZ's expertise.

An installed base comprising over 300 lines worldwide for slitting, side trimming, and cutting strips from the most different sources verifies ANDRITZ Sundwig's high competence in shearing lines. ANDRITZ offers customized solutions in response to customer expectations of all strip types, such as precision cold-rolled strip, surface-sensitive stainless steel, aluminum, and copper strip, but also hot-rolled strip. A maximum degree of flexibility is ensured here by a large number of patented solutions.



► Cut-to-length line



### Extract from our reference list

- Acroni d.o.o., Slovenia
- Aleris, Germany
- Antwerp Decoil Center B.V., Belgium
- C.D. Wälzholz, Germany
- Elval, S.A., Greece
- Hydro Aluminium, Germany
- Novolipetsk Steel, Russia
- Rautaruuki Oyj, Finland
- Salzgitter Flachstahl GmbH, Germany
- Taiyuan Iron & Steel Ltd., China
- Outokumpu Nirosta, Germany
- voestalpine Stahl GmbH, Austria
- Vosta BSG Stahlservice GmbH, Germany
- Wuhan Iron & Steel Corp., China

◀ Slitting line shear with automatic tool changing turret

## Blanking lines, levelers, and stackers

Numerous major customers all over the world use equipment from ANDRITZ METALS.

Blanking lines are used by car makers and/or their specialized sub-suppliers to cut sheets to different geometrical shapes.

Depending on the intended application, rectangular, trapezoidal, curved, or special shapes can be produced with these lines. Therefore, the lines are fitted with swiveling shears and/or cutting presses.

Their major components are the entry section, cleaning section, precision leveling machine, shears/cutting press, and magnetic stacker. Vacuum stackers are used for manufacturing aluminum blanks. Many

major car makers all around the world use these ANDRITZ Sundwig lines.

### Leading market position

Levelers are the core of finishing lines and are crucial to the shape and internal stresses of the individual parts. ANDRITZ has achieved a leading position with levelers for thick strip and sheets. Large thickness ranges (for instance, from 0.5 to 25 mm) can be processed on one machine thanks to patented roll change systems.



▲ Multiblancking line for carbon steel, stainless steel and nonferrous metals



▲ Stacker for cut-to-length strips

### Extract from our reference list

- Aleris, Germany
- Anhui Jianghuai Automotive Co. Ltd., China
- Audi AG, Germany
- Baosteel Iron & Steel Co. Ltd., China
- Chevy, China
- Daimler AG, Germany
- Dongfeng Citroen Automobile Co. Ltd., China
- Great Wall, China
- Hainan Mazda, China
- Hövelmann & Lueg GmbH, Germany
- IB Andresen Kft., Hungary
- Laura, Netherlands
- North American Stainless, USA
- Renault Group, France and Spain
- Shangyang, China
- Volkswagen AG, Germany

## Shape control systems

Low maintenance requirement with highest measuring accuracy. ANDRITZ METALS offers its customers decades of experience from 700 plants with almost 1,300 shapemeter rolls.

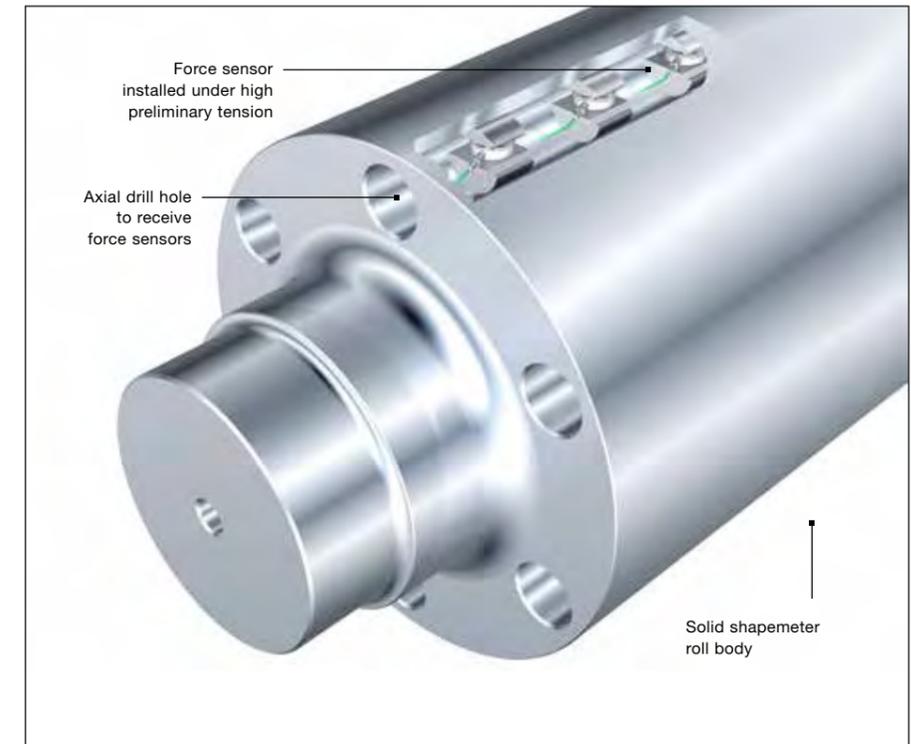
As an experienced rolling mill manufacturer, ANDRITZ Sundwig has built shape control systems for more than 30 years. Continuous development of the shape control systems – based on practical experience – ensures that the products always conform to the highest quality levels.

### Over 700 lines worldwide rely on our shapemeter rolls

How well the market has accepted ANDRITZ's BFI shape control systems is proved by over 700 lines worldwide, containing almost 1,300 shapemeter rolls. The universal ANDRITZ Sundwig shape control systems are used in the most varied rolling mill types in the steel, stainless steel, and nonferrous metal industries. Various different shapemeter roll designs are available.

### The system's advantages

- Rugged roll body made of solid steel
- Universal applicability due to closed roll surface and the roll's coatability
- High measuring precision thanks to piezoelectric quartz crystals
- Maintenance-free (non-contact data transmission, etc.)
- Shape control with MPC



▲ Schematic drawing of force sensors and their installation in the shapemeter roll

### Extract from our reference list

- Acerinox Group, Malaysia, Spain and USA
- Baosteel Iron & Steel Co. Ltd., China
- Jindal, India
- Lianzhong Stainless Steel Corporation, China
- NLMK OAO, Russia
- Outokumpu, Germany, Finland, Mexico, China and USA
- Posco Group, Korea, China, and Turkey
- Salzgitter AG, Germany
- Tisco, China
- voestalpine Stahl GmbH, Austria
- Wuhan Iron & Steel Corp., China

# Punching and metal-forming machines, servopresses

Cutting, leveling, stacking: More than 8,000 presses and automatic punching and metal forming machines from ANDRITZ METALS produce reliable, high-grade metal forming and punching products.

ANDRITZ Kaiser is known for the highest quality of cold metal forming technology: Its automatic punching, cutting, and forming technology provides extraordinary precision, high productivity, and the accustomed reliability, resulting from many years of experience and the technical design of the machines.

In addition to standard machinery, ANDRITZ METALS delivers customized solutions for any type of application – from the single press to complete production lines, including strip feeding and automation systems. The modular design ensures their universal use. The ANDRITZ engineering team ensures that each plant is optimally adapted to on-site circumstances.

## The product portfolio

- Complete production lines for punched and formed metal parts
- Automatic punching and forming machines from 630-25,000 kN, table lengths from 1,000-6,000 mm
- 2D and 3D CNC transfer systems with linear drives
- Roll feed devices
- Fully automatic tool change systems

More than 8,000 punching and metal forming presses produce metal products reliably, even after many years in use.

▶ Punching and metal forming press



▶ The 150 series modules can be combined to cover a pressing force range of 630 kN to 8,000 kN



## Freely configurable servopresses

The most recent development by ANDRITZ Kaiser is a dynamic servopress using the combination of well-proven design principles and the innovative servo drive technology. All presses provided with servo drives have freely configurable motion features for optimum adjustment of the ram movement of the servopress to any imaginable forming process. The ANDRITZ press control system offers a large range of typical motion curves, but customers can create and store their own curve profiles by simple 6-point programming. ANDRITZ METALS supplies servopresses with pressing forces from 1,000 to 16,000 kN.



▶ Punching and metal forming presses from 2,500 up to 25,000 kN

# Laser and resistance welding systems

No matter what you want to weld, we have the right solution for you, saving weight, reducing CO<sub>2</sub> emissions, and increasing your productivity.

ANDRITZ Soutec is a leader in the field of high-quality welding systems for round and flat applications. Our more than 130 fully automated systems produce over 160 million parts per year globally for the automotive industry. Furthermore, ANDRITZ Soutec is the leading company for high-quality roll seam resistance laser welding systems, in particular for the heating, ventilation, and air conditioning industries. Whatever you need to weld, ANDRITZ Soutec offers optimized customer solutions worldwide, from simple welding machines to complex production systems.

**Welding means being flexible, cost-effective, and forward-looking**



ANDRITZ Soutec meets the ever increasing requirements of the market by focussing on the huge importance of innovation. Together with leading companies in the steel industry, ANDRITZ Soutec creates value-added solutions by using steel and aluminum material in combination with proven technology to make the final welded product lighter and more cost-efficient at a higher quality level.

**Just a few of the many advantages:**

- High weld speeds
- 100% penetration and superb weld quality assured
- No post-welding leveling
- No reworking of seams
- Endless welding and coating
- Annual on-site inspection of your machine/system
- Telephone support 24/7 hours



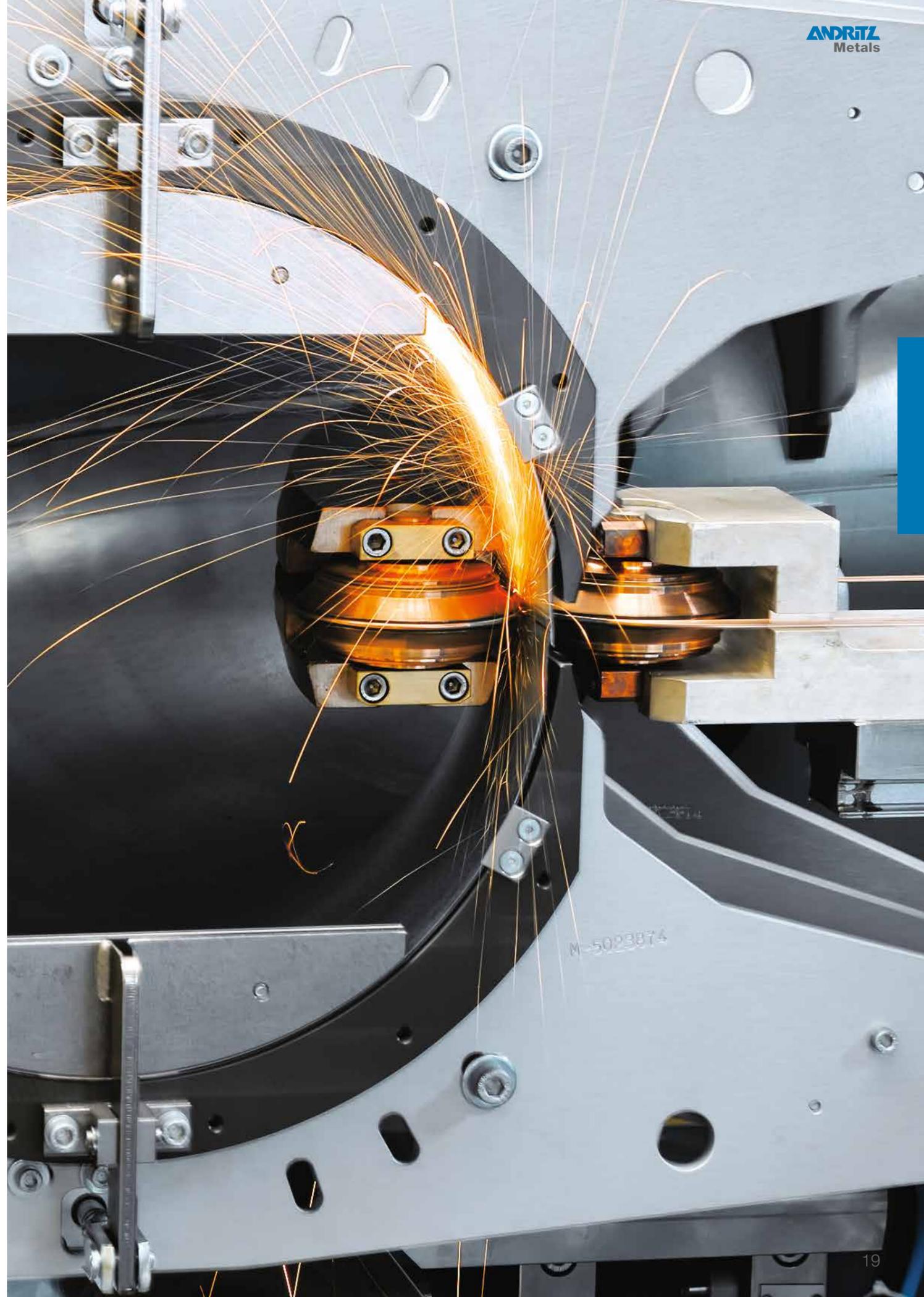
▲ Circuit board welded onto the non-linear SOUTRAC welding machine



▲ Finished products from the ANDRITZ Soutec tube welding machine, SOUTUBE



▲ SOUNPACT laser welding machine for linear seams



# Product overview

## Industrial furnaces

Moving ahead with experience and innovation

Industries served

Steel industry (BC & CC)	<b>Continuous furnaces</b> Rotary hearth furnace, Rotary table furnace, Roller hearth furnace, Double walking beam furnace, Walking hearth furnace, Walking beam furnace, Pusher type furnace, Tunnel furnace	<b>Special plant systems</b> Heat treatment plants for heavy plates, shaped profiles, and piping Furnace systems for DRI (direct reduced iron)
	<b>Batch-type furnaces</b> Car bottom annealing furnace, Hood-type annealing furnace, Car bottom forging furnace, Heat treatment pit furnace, Forging chamber furnace, Double Forging chamber furnace, Pit furnace	Heat treatment plants for railway wheels and rings Tempering systems
Copper industry (Cu)	<b>Melting furnaces</b> Shaft furnace, Stationary hearth shaft furnace, Tilttable hearth shaft furnace, Tilttable reverberatory furnace, Top blown rotary converter, Elliptical furnace	<b>Special plant systems</b> Direct-to-wire plants
	<b>Refining furnaces</b> Anode furnace, Peirce Smith converter, Tilttable reverberatory furnace, Top blown rotary converter, Drum-type furnace, Elliptical furnace	
Aluminum industry (Al)	Round top melter furnace, Tilttable holder furnace, Twin chamber furnace, Rectangular melting furnace, Pusher type furnace, Homogenizing furnace	
	Special furnaces, Aluminum heat treatment furnaces	

# Furnace systems for the steel industry

Thermal processing lines for the melting, re-heating, and heat treatment sectors

Based on its long tradition and experience, ANDRITZ Maerz has developed into one of the leading suppliers of furnace systems to all industries in the melting and heat treatment sectors. The activities of ANDRITZ Maerz include the planning, design, engineering, supply, installation, and start-up of industrial furnaces and accessory installations. All supplies and services are modeled on each customer's particular requirements. Thus, ANDRITZ Maerz sees its role not only as an engineering company and equipment supplier, but as a solution provider.

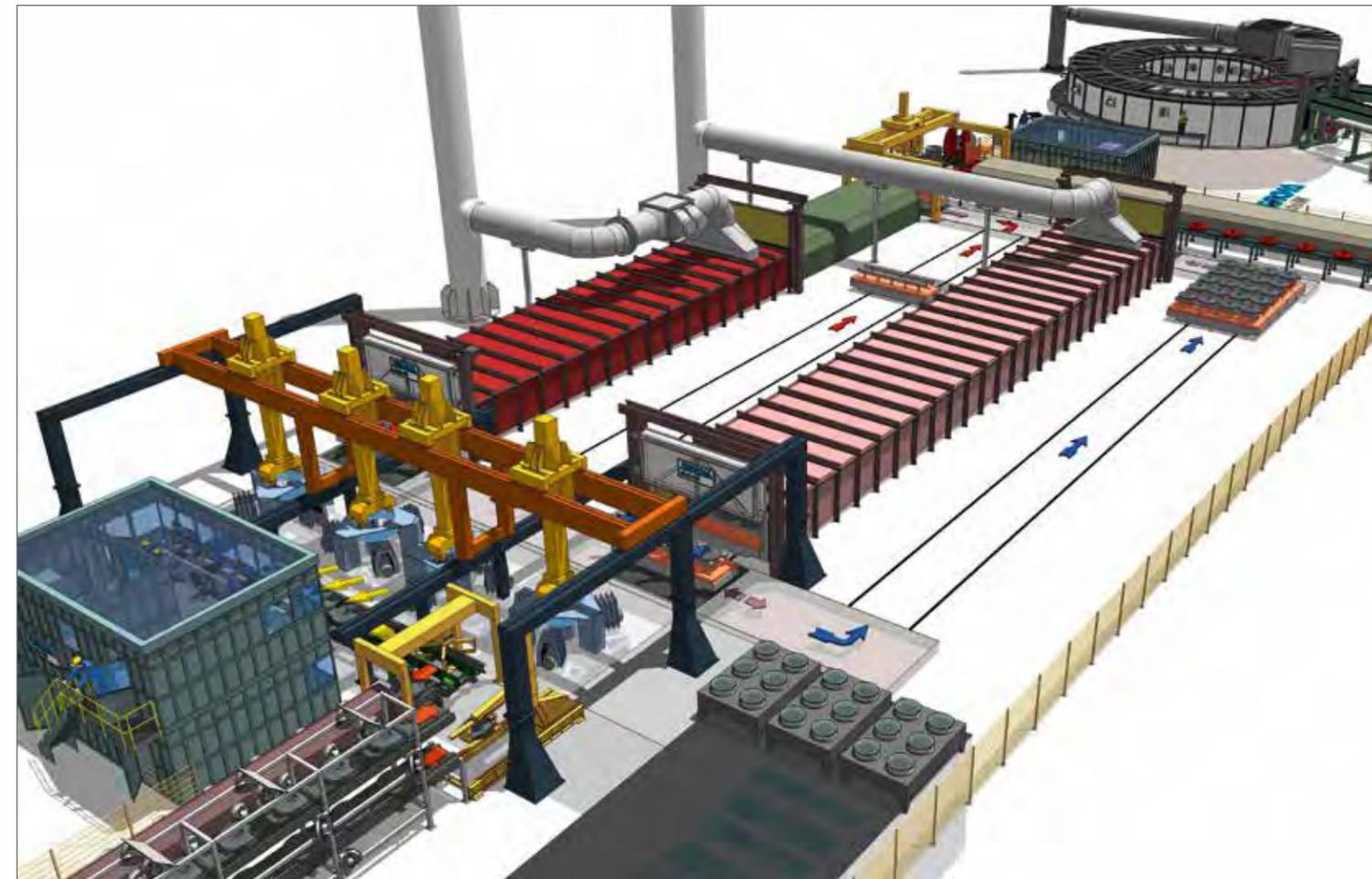
### Specialists in modernizing continuous furnace plants

In addition to the product portfolio that is customary in furnace construction for the forming and hot-rolling industry, the company specializes in modernizing continuous furnace plants, e.g. walking beam furnaces. ANDRITZ Maerz clearly leads the market for batch-type furnaces for highly specialized forging shops. In this area, customers are mainly looking for complex re-heating furnaces and tempering systems; railway wheel tempering systems are a specialty here.

### Extract from our reference list

- Group Dillinger Hütten, Germany and France
- JSC Nizhniy Tagil Iron and Steel Works, OAO "NTMK", Russia
- Karl Diederichs KG, Dirostahl, Germany
- NLMK DanSteel A/S, Denmark
- Salzgitter Group, Germany
- Thyssen Krupp Group, Germany
- Vallourec Group, Germany and France
- voestalpine Group, Austria, Germany, and Sweden

▼ Rotary hearth furnace



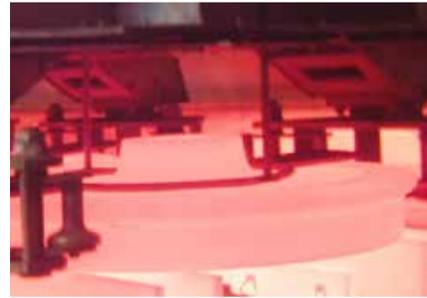
# Hardening and tempering plants for railway wheels

High-speed trains traveling at more than 300 km/h – high-speed railway wheels are hardened and tempered in furnaces from ANDRITZ METALS.

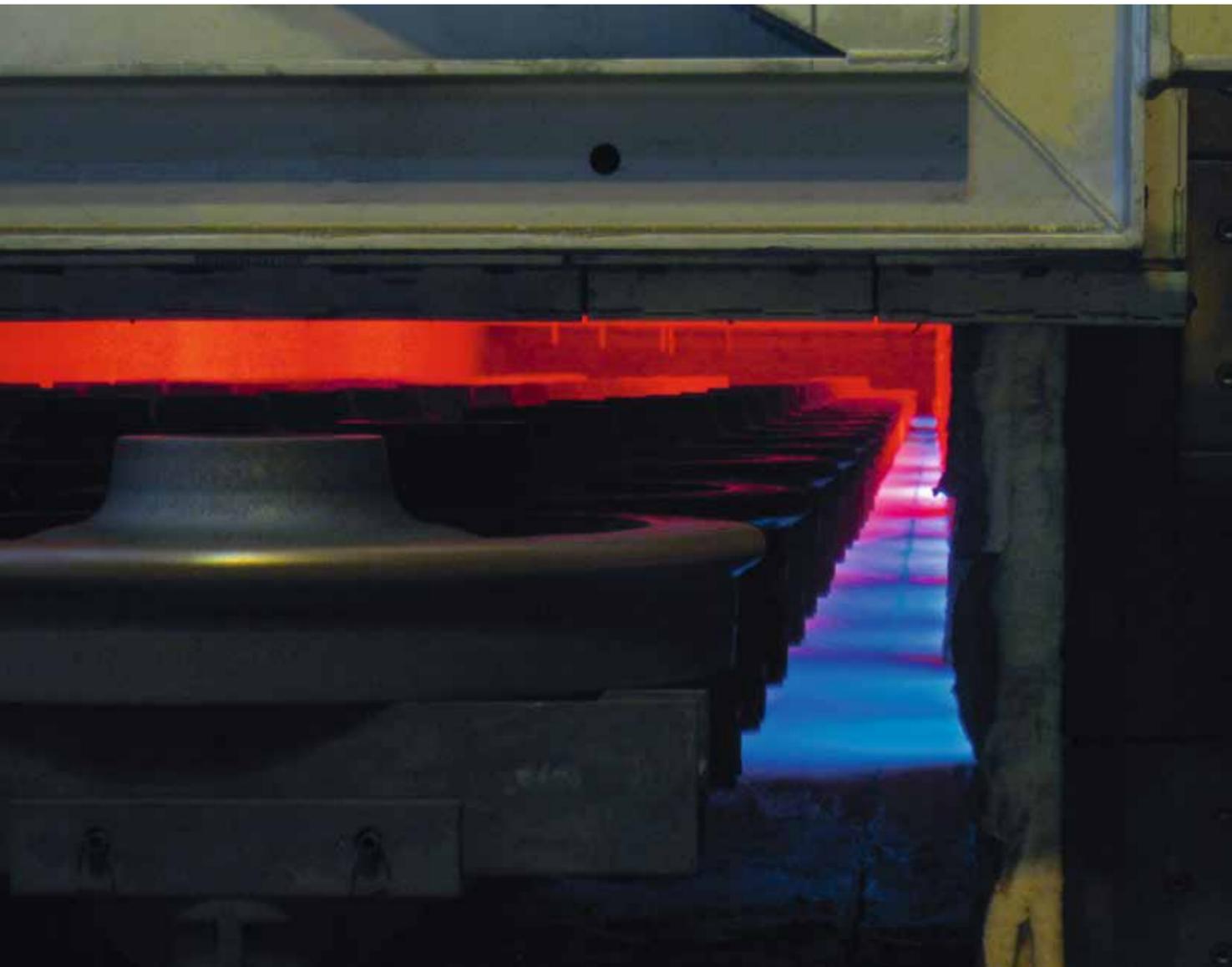
The railway wheel is a mass product that has to fulfill high safety standards. Wheels for rail transport are among the most stressed components in railway vehicles, carrying axle loads of 25 t and more. Proven technologies from ANDRITZ METALS for fully automated heat treatment lines for railway wheels fulfill the highest standards for high-speed trains in terms of safety and service life.

## Modern burner systems reduce operating costs

Modern ANDRITZ burner systems are used for economical operation, especially in the high-temperature range. In comparison to plants operated with cold air, this type of burner system can reduce gas consumption and, consequently, CO<sub>2</sub> emission by up to 50 %.



▼ Heat treating of railway wheels ▲



# Furnace systems for the copper industry with intelligent process know-how

ANDRITZ Maerz supplies turn-key industrial furnace systems including process know-how for copper and non-ferrous metallurgy

In the copper industry, we are one of the very few global suppliers to the primary and secondary copper refining sector. The product portfolio includes smelting, refining and casting furnaces for copper and selected non-ferrous metals. Our furnaces and converters are used worldwide in the primary and recycling industry, as well as in processing plants. In addition, TBRC converters enable the complex recycling of dusts, slags, alloys, and WEEE scrap. Our process know-how allows efficient manufacturing of quality products in wire, pipe, and shape production, and for anodes used in electrolytic processes. With the ANDRITZ Maerz Direct-to-Wire method, an additional and particularly efficient process

technology is available for the production of FRHC copper.

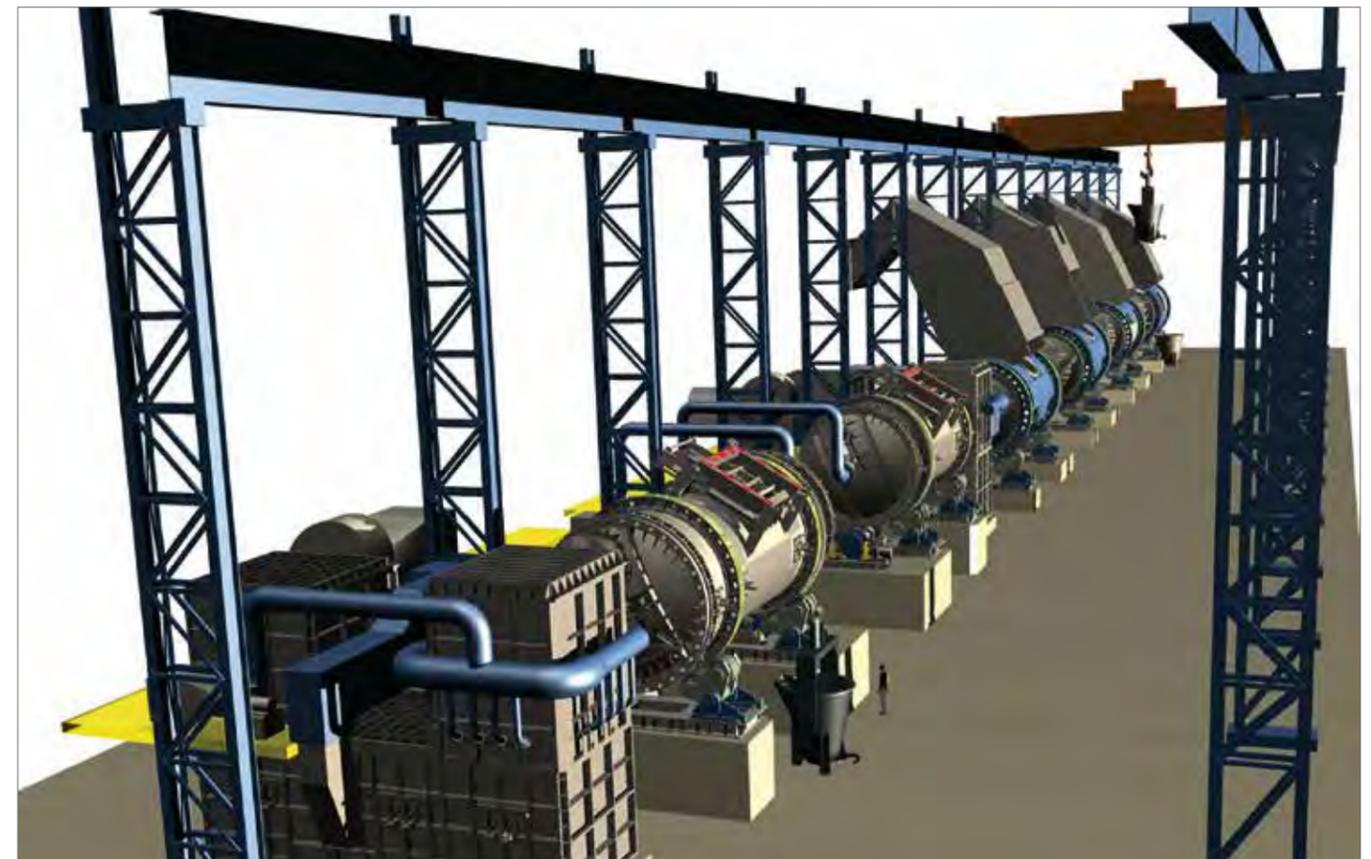
## The product portfolio

- Drum-type furnaces for holding and refining
- Tiltable hearth-type reverberatory furnaces for refining of copper scrap
- Tiltable elliptical furnaces for refining of copper scrap
- Shaft furnaces for melting of cathodes and high-grade scrap
- Top blown rotary converters for copper and non-ferrous metal applications
- Peirce Smith converters for copper and nickel

## Extract from our reference list

- Aurubis AG, Germany
- Cunext Group, Spain
- First Quantum Minerals Ltd., Zambia
- Glencore Xtrata plc, Australia
- Jiangxi Copper Co., Ltd., China
- Russian Copper Company ZAO, Russia
- Xiangguang Copper Smelter Co., Ltd., China

▼ Anode furnaces and Peirce Smith converters



# Furnace systems for the aluminum industry

Our typical customers process molten or solid aluminum and rely on our large-capacity melting, holding and heating solutions with high productivity and minimum energy consumption.

The typical customers of ANDRITZ Metals Inc. (formerly ANDRITZ Bricmont) process molten or solid aluminum. We provide proven experience, expertise, design solutions, and construction services for both primary and secondary producers. If you process solid aluminum, we are your experts for preheat and reheat pusher, pit, car bottom, auto-batch, fuel-fired, or electric furnaces.

### Retrofitting and rebuilding

When retrofitting and rebuilding your existing installation, you will want to involve an expert. Our project management and engineering teams utilize their qualifications, skills, and experience to help achieve your goals. Combining our strength in engineering and rebuilding or upgrading your furnace system with our state-of-the-art project

management tools and critical path analyses, we ensure that projects are completed on time, on budget, and to your specification.

### More than 850 installations worldwide

Slab heating			Liquid & Prep		Heat treatment		
Pit	Pusher	Car bottom	Melting Holding	Pre-heat	Coil annealing	Log homo	Vertical H.T.
400	23	65	211	6	63	13	58
<b>488</b>			<b>217</b>		<b>134</b>		

▼ Melting furnace



# Industrial burners and refractory products

Modern burner systems for advanced thermal process applications in the steel and aluminum industry

ANDRITZ FBB is the leading supplier of industrial burners, complete heating systems, and combustion equipment for a wide range of thermal applications in industry, particularly in the steel and aluminum industries, the forging industry, and for many other low and high temperature processes. ANDRITZ FBB has global experience and is best known for advanced thermal process technology serving established and expanding into new markets worldwide. Burners, heating, and combustion systems are designed and customized to increase furnace output and productivity and to optimize energy efficiency and product quality with minimized fuel consumption and lowest NOx emissions. The product portfolio ranges from cold and hot air burners to regenerative burner systems and flameless combustion systems operating with nearly all fuels.

### Refractory products customized to increase furnace productivity and optimize energy performance



ANDRITZ FBB serves customers worldwide with pre-fabricated components and functional refractory products made of dense and light-weight refractory castables. ANDRITZ FBB's refractory division is the leading supplier of pre-fabricated insulating shells made of refractory castables for skid pipe systems in reheating furnaces (walking beam furnaces, and pusher-type furnaces). A modular lining concept using pre-fabricated parts with a thermally optimized sandwich design provides shorter installation times and reduces the downtime of the furnaces during maintenance, thus increasing their productivity.

Excellent on-site support during installation, start-up, training, maintenance, and inspection work, as well as worldwide service complete the total package.

### Extract from our reference list

- Aluminium Norf GmbH, Germany
- Anshan Steel Corp., China
- Erdemir, Turkey
- Georg Fischer GmbH, Austria
- JSW, India
- Nippon Steel, Japan
- Rautaruukki Oyj, Finland
- Saarschmiede GmbH, Germany
- SSAB, Sweden
- Ural Steel, Russia
- Uzmetkombinat JSC, Uzbekistan



▲ Pre-fabricated insulating shells for skid pipe system (WBF)



▲ Combustion chamber

# Plant modernization and process automation

Customized and low-cost process optimization:  
The ANDRITZ METALS service range covers the system's entire life cycle.

The metal industry is facing continually rising demands, which can only be met by developing customized and yet cost-effective technical solutions.

This objective is achieved with flexible and application-oriented automation technology in conjunction with standardized and modern hardware and software systems. Exact knowledge of the line and process technology, combined with many years of practical experience, has yielded mature solutions and brought the systems of ANDRITZ METALS to the forefront in terms of quality and productivity.



## From planning to continuous plant optimization

ANDRITZ METALS combines process knowledge and experience with modernization programs to find new ways of improving productivity and quality in the metal industry while also reducing downtime. Whether the project is aimed at increasing production capacity, applying new technologies to existing assets, or optimizing the entire process, we pay great attention to overall efficiency, reliability, and sustainability. Highly efficient solutions are available for revamping of existing processing lines, either during production or within a very short conversion time. We combine proven process solutions with the latest technologies, such as mathematical models and advanced control strategies, to achieve the best results in production and meet the most stringent environmental protection requirements.



▲ Process visualization and monitoring ▶



▲ Control room for automatic plant management



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