



LOWER OPERATING COSTS AND HIGH QUALITY HEATING

Industrial grade furnaces

ANDRITZ



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The ANDRITZ furnace family

DECADES OF EXPERIENCE, INDUSTRY LEADING INNOVATION

ANDRITZ is a globally leading supplier of plants, equipment, systems 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 as well as for animal feed and biomass pelleting. Other important business segments include automation and service business.

ANDRITZ Metals is one of the leading global suppliers of complete lines for the production and processing of cold-rolled strip made of stainless steel, carbon steel, aluminum, and non-ferrous metal. The lines comprise equipment for pickling, cold rolling, heat treatment, surface finishing, strip coating and finishing, punching and deep drawing, and the regeneration of pickling acids. The business area also supplies turnkey furnace systems for the steel, copper, and aluminum industries, as well as welding systems for the metalworking industry.

By acquiring Bricmont Inc., Maerz GmbH, Selas S.A.S., and FBB Engineering GmbH, the ANDRITZ Group has extended its product portfolio in the steel furnace supply segment of the Group's Metals business area.



ANDRITZ METALS USA INC.

Founded in 1965, ANDRITZ Metals USA Inc., formerly Bricmont Inc., made its name by specializing in the design and supply of a wide variety of furnaces and related equipment: tunnel furnaces, walking beam and walking hearth furnaces, pusher furnaces, heat treatment furnaces, rotary hearth furnaces, strip processing furnaces, mechanical handling equipment, and emission control systems. Whether it is training, engineering studies and analyses, construction, upgrades, or project management, ANDRITZ Metals USA Inc. has the tools and knowledge to complete any project.

ANDRITZ METALS GERMANY GMBH - FURNACE DIVISION

Founded in 1911, ANDRITZ Metals Germany, formerly ANDRITZ Maerz, is one of the leading suppliers of engineering, knowhow, and process technology for the steel and precious metals industries. Because of its long tradition and experience, ANDRITZ Metals Germany is one of the leading suppliers to the steel industry in the melting and heat treatment sectors. The activities of ANDRITZ Metals Germany include the planning, engineering, supply, installation, and start-up of furnace systems for thermal processes and accessory installations.

- BURNERS & REFRACTORY DIVISION

ANDRITZ Metals Germany, formerly ANDRITZ FBB, serves customers worldwide with pre-fabricated components made of refractory castables, e.g. insulating shells for skid pipe systems in reheating furnaces. Company also designs and manufactures burners and combustion systems customized for increased furnace output, optimization of energy efficiency, and product quality with minimized fuel consumption and lowest NOx emissions.

ANDRITZ METALS FRANCE S.A.S.

ANDRITZ Metals France, formerly ANDRITZ Selas, is one of the oldest companies in the ANDRITZ Metals Group. Founded in 1896, ANDRITZ Metals France is known globally for innovation in its hot dip galvanizing and continuous annealing lines. In fact, ANDRITZ Metals France holds a patent for specialized inductive heating for use in continuous annealing and galvanizing lines.



Global technology leader with complete process solutions

COMPLETE PROCESS SOLUTIONS FOR OUR CUSTOMERS

If you are in the steel or aluminum industry ANDRITZ Metals can help you no matter the application. The ANDRITZ Group is headquartered in Graz, Austria and has a staff of more than 29,000 employees worldwide. ANDRITZ operates more than 280 production sites and service/sales companies around the world. With ANDRITZ offices all over the globe, we are prepared to meet your needs wherever you are. No matter what job you are faced with, our technological and design experience coupled with our dedication to quality and efficiency will provide you with the equipment that is built to provide a quality product and last for years to come.



Pusher furnaces fuel efficient, cost effective

Pusher furnaces combine a relatively simple, fuel-efficient means of heating with environmentally and regulation-friendly low NOx emissions. With the rising costs of business today, an ANDRITZ Metals USA Inc. pusher furnace will keep your operating costs low while meeting your production requirements. While being cost effective in both capital and operating costs, it also provides a well heated product and requires less mechanical maintenance than other kinds of furnaces.



Pusher furnace

Walking beam and walking hearth

BETTER QUALITY WITH MORE PRODUCTION

When the application calls for better quality and higher production, ANDRITZ Metals USA Inc.'s walking beam and walking hearth furnaces meet the requirements. These furnaces provide excellent temperature uniformity while providing flexibility in transporting product into and out of the furnace. The ANDRITZ Metals USA walking beam furnace features innovations door sealing and scale handling designs and is ruggedly built to provide years of service and utilize state-of-the-art controls and automation software.



A Walking beam furnace - structural
B Walking beam furnace hot strip
C Walking beam furnace - structural



Rotary furnaces

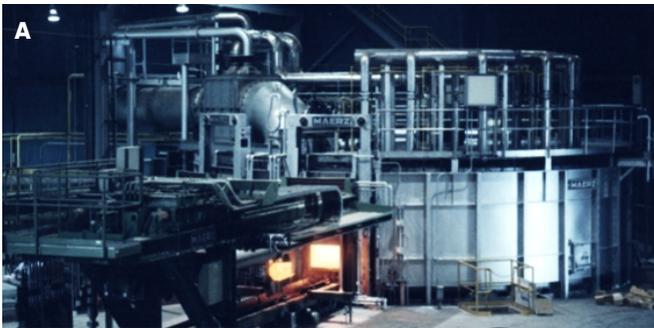
STEEL REHEATING

An ANDRITZ Metals USA rotary furnace is perfect for reheating steel billets for rolling or forging. Its compact design saves building space while utilizing minimal ancillary equipment to charge and discharge the furnaces. The unique design also provides convenient access to the combustion system and the mechanical hearth transporting system. Sequence and pulse firing of zones provide excellent efficiency and product temperature uniformity.

FOR DIRECT REDUCED IRON PROCESSING

In 1997 ANDRITZ Metals USA built the first coal-based

55 meter diameter rotary hearth furnace for Iron Dynamics in Butler, Indiana. The ANDRITZ Metals USA rotary hearth DRI furnace accepts pelletized or briquetted iron ore and reductant, heats them, and reduces iron oxide to metallic iron. The resulting product becomes a low cost substitute for scrap in steel making. Our DRI rotary hearth furnace can be designed to produce up to 500,000 metric tons per year. ANDRITZ Metals USA has a long history of joint furnace development for direct reduction including the FASTMET and SIDCOMET processes. Additionally, we have completed a development effort with the American Iron and Steel Institute for the paired straight hearth furnace.



A ANDRITZ Metals Germany billet reheat furnace

B ANDRITZ Metals USA DRI rotary furnace

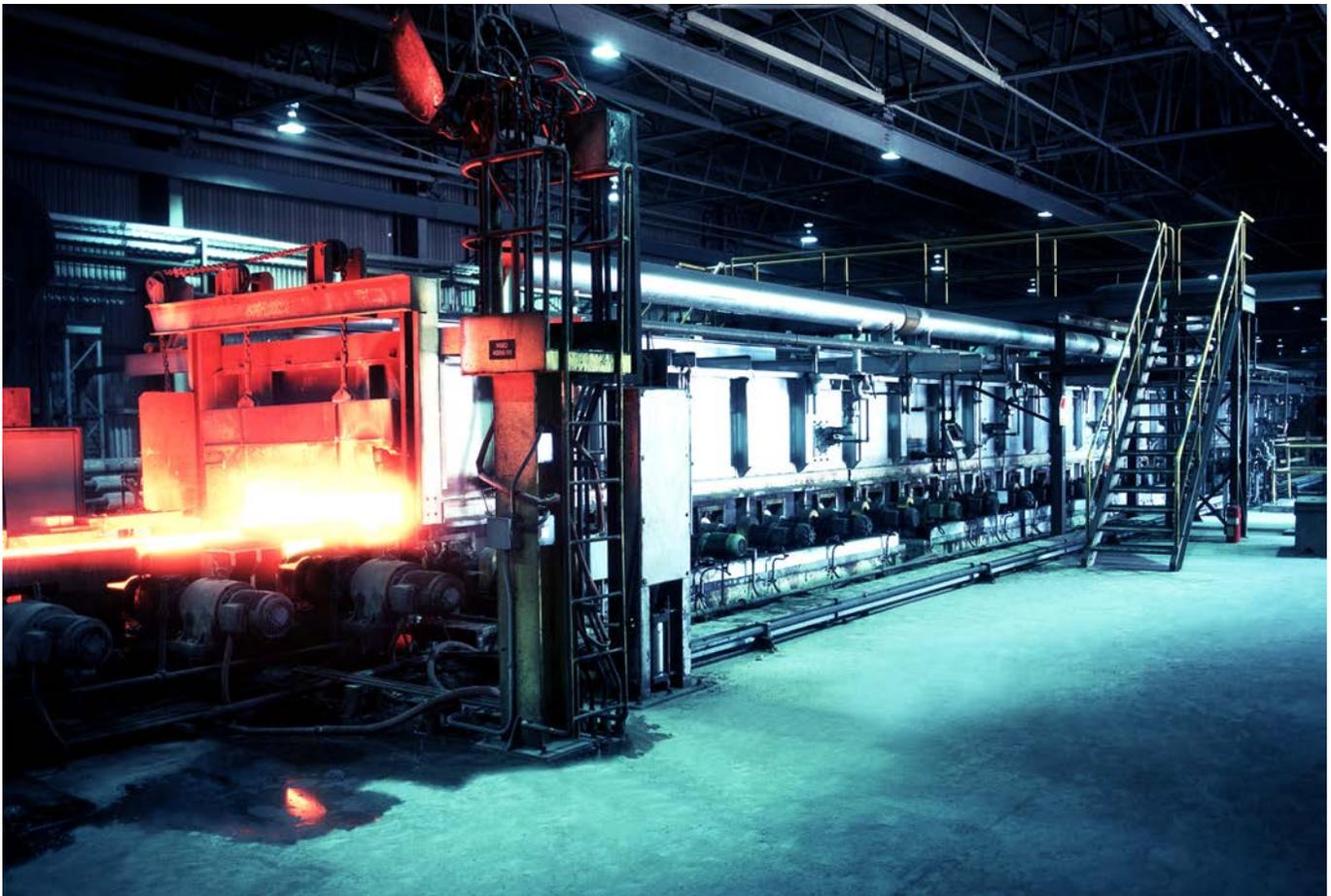
C ANDRITZ Metals USA rotary furnace

Tunnel and roller hearth furnaces

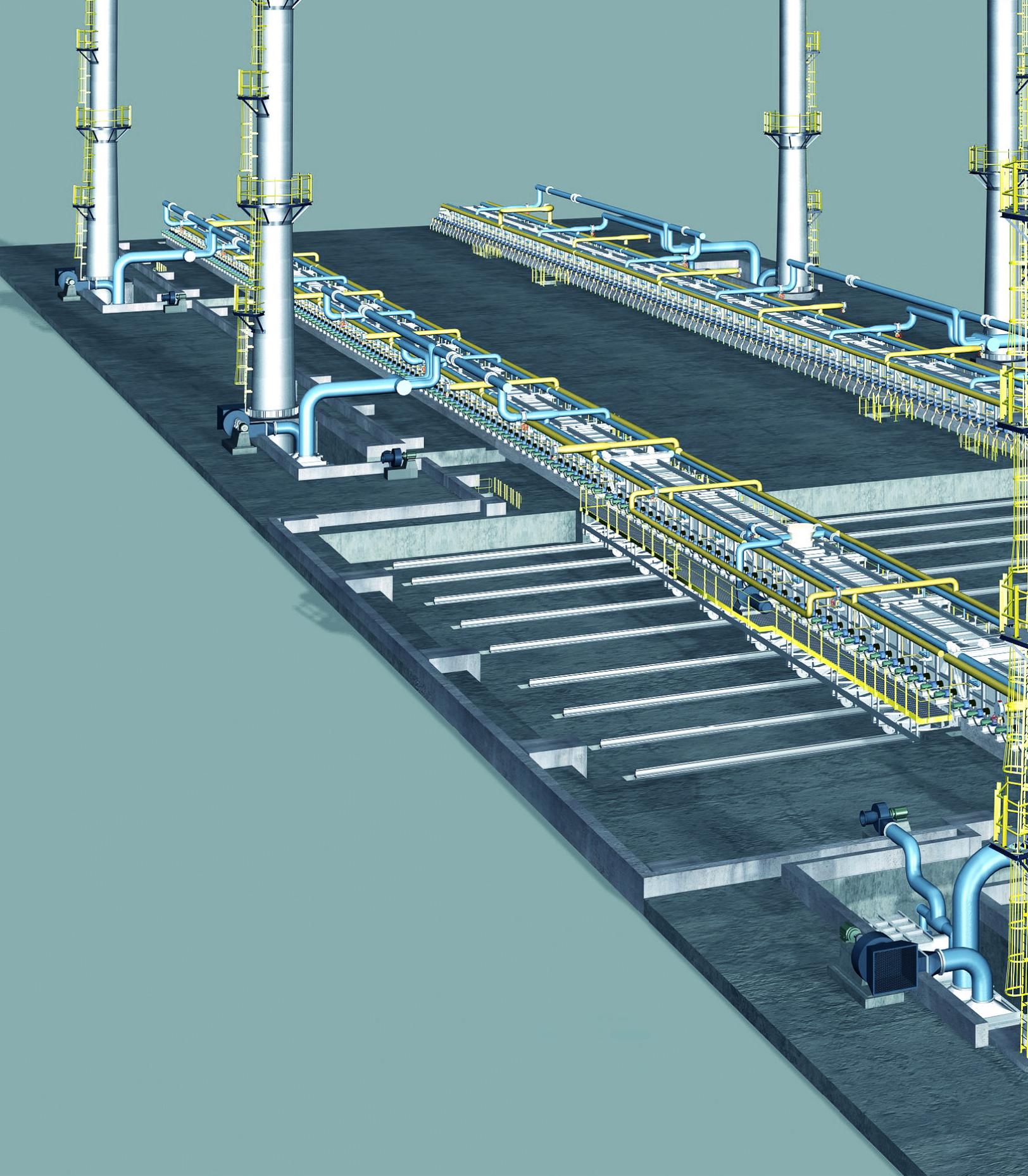
The ANDRITZ Metals USA tunnel or roller hearth furnaces are considered the industry standard. We built the first-ever thin slab tunnel furnace for Nucor in Crawfordsville, Indiana in 1989. Since then, we have successfully installed more of these furnaces globally than anyone else in the industry.

An ANDRITZ Metals USA tunnel furnace provides the buffer time and temperature uniformity for heating slabs for a continuous hot strip mill. Due to years of design and operating experience, our furnaces provide high productivity for every one of our customers.

The ANDRITZ Metals USA tunnel furnace heats thin slabs from a near net shape caster before entering the mill. The furnace provides excellent temperature uniformity while maintaining consistent production between the caster and the mill. Numerous slabs can be stored in the furnaces should the mill go down, allowing the caster to keep casting. A sophisticated, state-of-the-art control system keeps the whole process (caster - furnace - mill) in sync, minimizing "crashes" or "caster aborts." The ANDRITZ Metals USA tunnel furnaces come equipped with either parallel or swivel type shuttles for dual line operations.

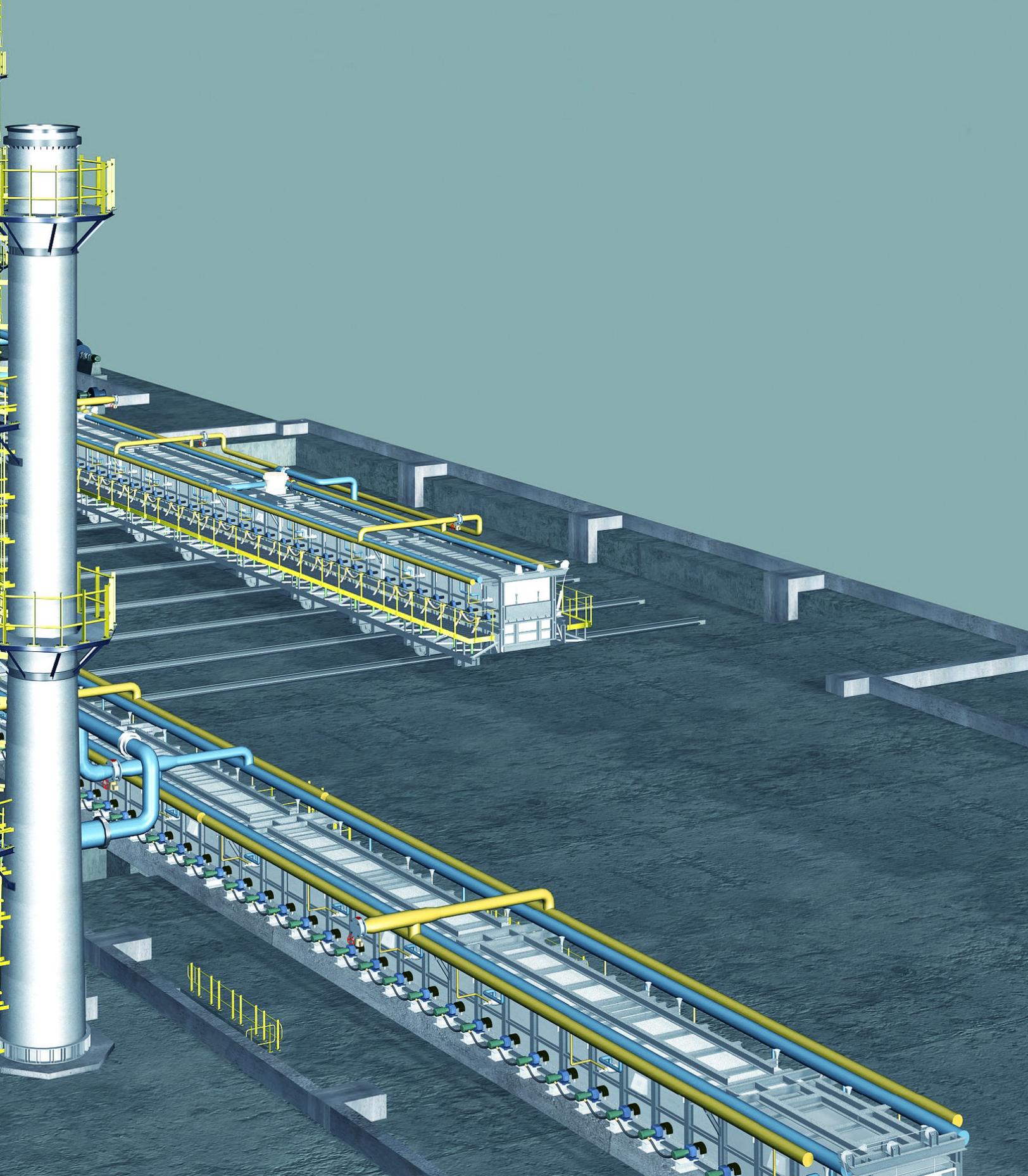


ANDRITZ Metals USA tunnel furnace for Severstal



Dual line tunnel furnace for C.S.P. (shuttle)





Batch furnaces

HIGH PRECISION, HIGH PRODUCTIVITY

Precision knowledge is what makes ANDRITZ Metals Germany an industry leader in batch furnaces. We design batch type furnace systems for forge and heat treatment plants, provide plant automation, and supply melting and refining furnaces as well. More specific solutions include reheating batch furnaces like car bottom forging furnaces, chamber or double chamber furnaces, and pit furnaces.

ANDRITZ Metals Germany is also a dependable name in heat treatment process furnaces such as car bottom annealing furnaces, shaft furnaces, hood-type furnaces,

and heat treatment pit furnaces. ANDRITZ Metals Germany's customers are in need of complex reheating furnaces and tempering systems and we are always ready to provide the best furnace to meet their requirements. We focus on the demands and requirements of the thermal process (uniformity, efficiency, and productivity), which are vital for the furnace design to achieve short processing times, high productivity, and constant and reproducible product quality. Our furnace technology is in compliance with quality certifications like the AMS 2750D and Nadcap to ensure consistent quality. Trust in our extensive experience to design your next batch furnace.



ANDRITZ Metals Germany car bottom annealing furnaces



Commercial galvanizing

FLEXIBLE, ADAPTABLE, AND EFFICIENT

ANDRITZ Metals USA uses modern horizontal or "L"-shaped configurations for the hot dip galvanizing of continuous low carbon steel strip for use in the commercial galvanizing market. Our furnaces are designed to be adaptable for future uses such as aluminizing. They are more efficient than traditional galvanizing line furnaces, and more flexible in handling unexpected temperature fluctuations in the event of line stoppages.

ANDRITZ Metals USA uses all low thermal mass construction materials, which allows our furnaces to react quickly to changes in strip requirements and also to improve reco-

very and prevent breakage from overheating in the event of a line stoppage.

We are also proud of our industry leading energy-efficiency. Throughout the heating and cooling phases of the system, ANDRITZ Metals USA furnaces capture more potential energy - over 35% more than others - from combustion waste products. Additionally, all thermal cycles are under the control of advanced level 1 and level 2 control systems engineers and designed to provide maximum flexibility. Your furnace will run consistently and efficiently with your specific product type requirements, rather than using an averaged and generalized overview of galvanizing requirements others incorporate.



ANDRITZ Metals USA continuous galvanizing line furnace

High-end automotive galvanizing

HIGH QUALITY, LOWER ENERGY CONSUMPTION

Both the automotive and construction industries are facing ever increasing requirements for production lines that deliver higher product quality, reduced scrap loss, and higher production rates. While at the same time reducing the consumption of resources. ANDRITZ Metals offers the solution.

ANDRITZ Metals France offers continuous galvanizing lines (CGL) with vertical, horizontal, or L-shaped furnaces to meet customers' needs for carbon steel strip processing for building, home appliances or automotive non-expo-

sed and exposed parts. Using advanced thermodynamic mathematical models, ANDRITZ Metals France is able to optimize transition times and minimize energy consumption. ANDRITZ Metals provides equipment not only for the furnace with an atmosphere of HN_x (mixture of N_2 and H_2), but also for the cooling tower and the post-treatment section in terms of heating and cooling.

With partners and additional Group companies, ANDRITZ is able to offer the complete line solution including terminal equipment for coil handling at the beginning and end of the line.



ANDRITZ Metals France continuous galvanizing line



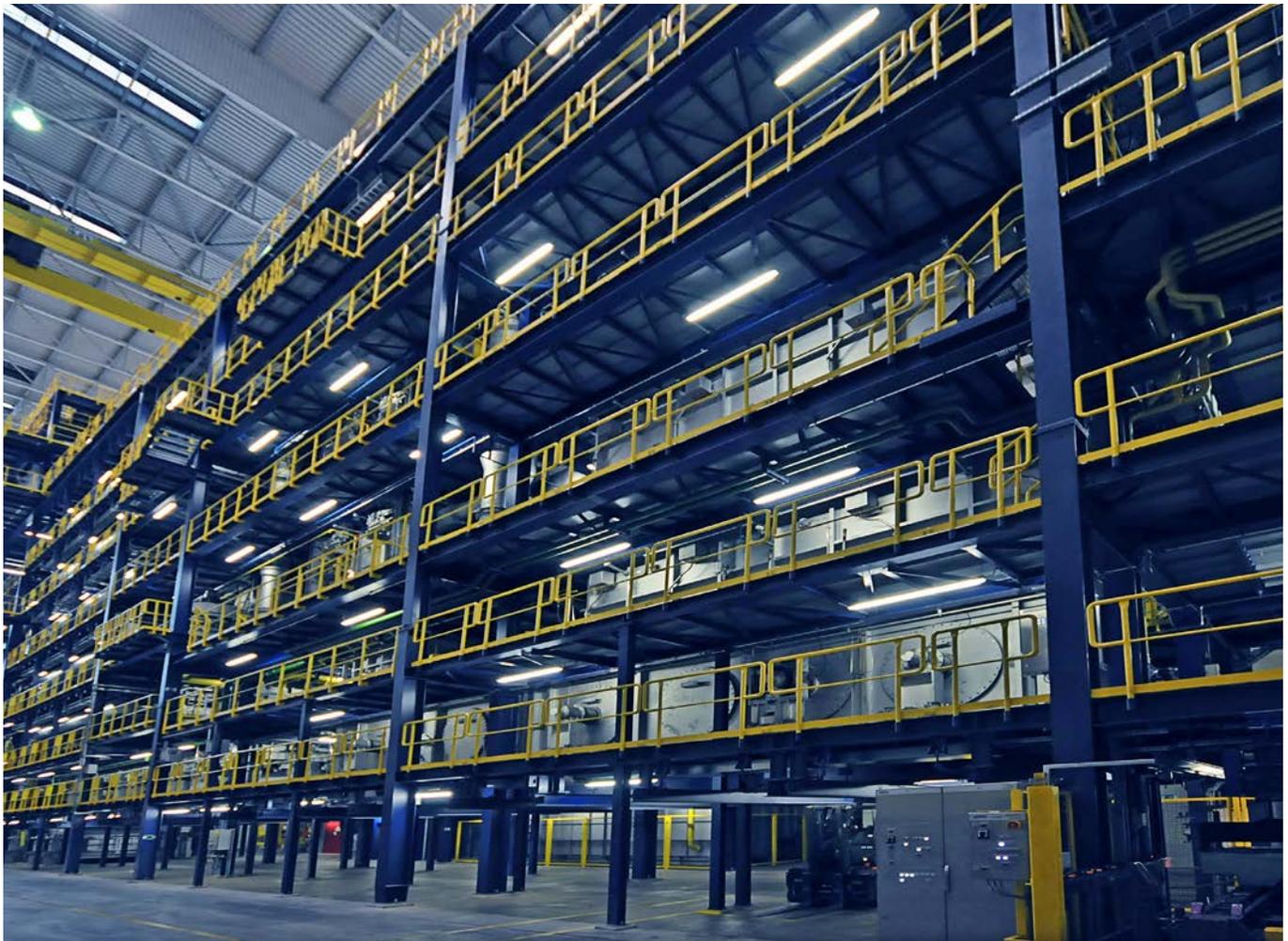
Continuous annealing

OPTIONS TO MEET YOUR NEEDS

ANDRITZ Metals France is an industry leader when it comes to continuous annealing furnaces. Our experience and technical innovation has led us to develop furnaces with a wide variety of heating and cooling technologies to better meet our customers' needs.

ANDRITZ Metals France furnaces are flexible enough to be multifunctional for many grades of steel and will provide

uniform temperatures throughout the process. Whether you need our Direct Fired Furnace (DFF) technology to reduce space requirements and increase energy efficiency or you need cooling solutions like our patented Differential Rapid Jet Cooling (DRJC) or profiled After Pot Cooling (APC) for the highest cooling efficiency and flexibility, ANDRITZ Metals France has the right options for you.



ANDRITZ Metals France Furnace

Annealing of stainless-steel strip

ANDRITZ Metals supplies custom-tailored annealing and pickling lines (APL) with or without inline equipment, such as rolling mills.

Through permanent development and decades of experience, ANDRITZ Metals furnace technology for annealing and pickling lines (APL) has become one of the leading products in the market.

ANDRITZ Metals France offers design, building, and erecting of new furnaces, as well as rebuild of existing systems. Furnaces for annealing and pickling lines for hot-rolled and cold-rolled stainless strip. A wide range of stainless-steel strip can be processed in these furnace types.



Annealing and pickling line furnace heating section



Furnace upgrades and spares

TRUST OUR EXPERIENCE TO IMPROVE YOUR FURNACE

Furnaces are not like the latest fashion. A well-built furnace is designed to last for decades, but even the best designed furnaces can't survive forever. Parts wear down, system controls become obsolete and safety requirements change. Operating practices adapt and maintenance costs increase. The latest technology utilized when the furnace was built can no longer compete with new technology.

ANDRITZ Metals USA understands that the rapid pace of technology, increased quality demands, efficiency considerations, and changing governmental standards means that furnace owners will eventually have to make the choice between upgrading an old furnace or buying a new one. We have the skills, knowledge, and technology to upgrade your current furnace to be safer, while also increasing production and heating quality, and reducing emissions and operating costs. Whether it is a controls system overhaul, or replacing your old combustion system with a more efficient and environmentally friendly one, we are ready to help you. We have an experienced engineering staff that can provide a custom solution for a custom problem.

ANDRITZ METALS USA ALSO SUPPLIES:

- Furnace combustion audits
- Instrumentation calibrations
- Furnace uniformity tests
- Operation and maintenance training
- Proprietary high temperature alloy parts
- Precast refractory systems
- Structural fabrications
- Furnace roll assemblies
- Re-engineering components and systems to provide longer life, reduce downtime, and lower maintenance costs



A Pre-fabricated insulating shells for skid system (WBF)
B Furnace upgrade

Controls systems

ANDRITZ Metals USA relies on its in-house engineers to deliver state-of-the-art level 1 and level 2 control systems for all of its furnaces and equipment. ANDRITZ Metals USA can also help you streamline and troubleshoot your current control system.

LEVEL 1

ANDRITZ Metals USA provides a large selection of hardware and controls from major suppliers like Rockwell Automation, Siemens, Honeywell, Mitsubishi, and Toshiba. We use a PLC based safeguard system in both new furnaces and furnace upgrades, which can be used in lieu of a hard-wired safety circuit all in accordance with new standards from NFPA.

LEVEL 2

ANDRITZ Metals USA level 2 systems are programmed to include making real time fully functional mathematical

heating models, piece thermal readiness and in-furnace piece tracking, events alarming and tracking, and optimize furnace operations during mixed charging (hot, cold, different grade, and size) so that each piece is properly heated. The level 2 system also provides accurate and relevant reports on fuel consumption, production, product heating history, and can break down information by shift, day week, or month.

TROUBLESHOOTING

Our engineers have years of experience in all aspects of industrial process control systems such as induction heating, combustion, solids/fluids handling, and information flow over a range of metals industries such as steel, iron, copper, titanium, and aluminum.



ANDRITZview app

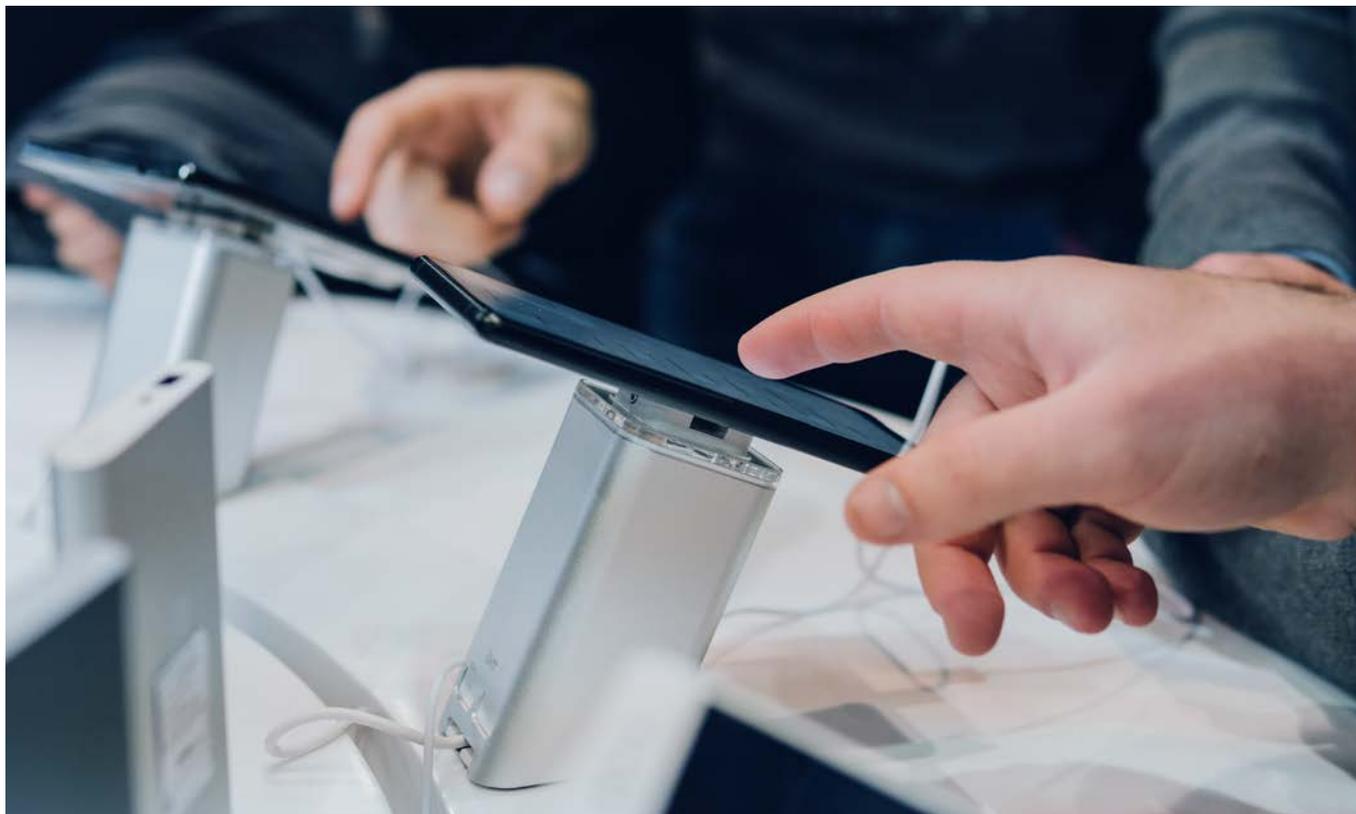
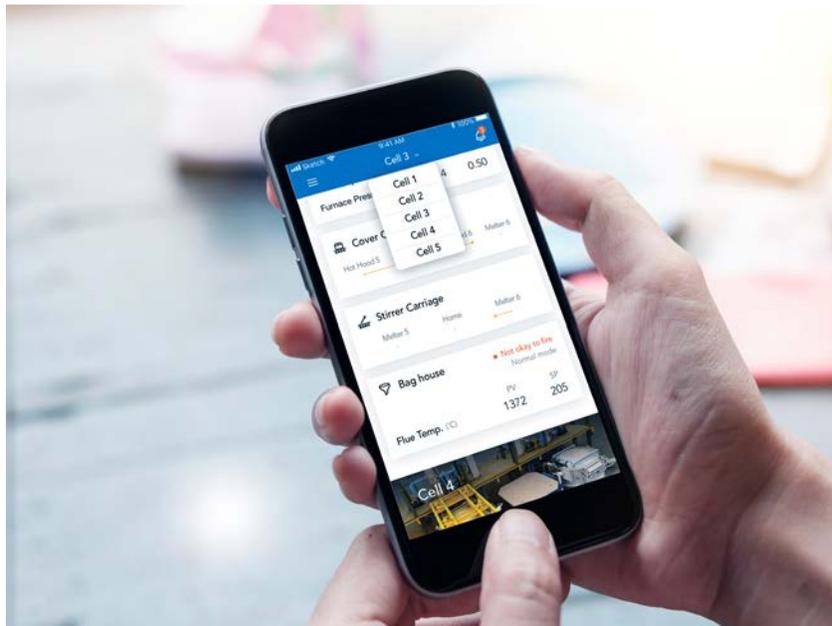
INNOVATIVE APP - READY FOR INDUSTRY 4.0

With our app, you can gain visibility into the production process at your plant from the comfort of your home or office. Download the latest version from the App Store.

The functions of the app:

- Real time data visualization
- Instant notification of alarms
- IOS and Android applications available

Ask ANDRITZ how this can be implemented at your facility.





ANDRITZ METALS

ANDRITZ Metals Processing is a global leader in providing cutting-edge solutions for the production and processing of cold-rolled strip made of carbon steel, stainless steel, aluminum, and other non-ferrous metals. Our innovative technologies and comprehensive services ensure that we support our customers at every stage of the plant life cycle, from initial setup to ongoing maintenance and optimization.

We combine our deep industry expertise with advanced automation and digitalization to help our customers achieve peak performance and sustainable growth. Our service business is dedicated to maximizing the efficiency and longevity of your equipment, ensuring you stay ahead in a competitive market.

ANDRITZ. FOR GROWTH THAT MATTERS.

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