

STEEL+ TECHNOLOGY

THE TECHNICAL MAGAZINE FOR IRON AND STEEL PROFESSIONALS AROUND THE WORLD

Rely on our Experience gained from well over
100,000 Industrial Burners and benefit from:

- Preparation for Future-proof H₂ Operation
- Maximum Efficiency > 80 %
- Lowest NO_x Emissions < 100 mg/Nm³
- Outstanding Temperature Uniformity



YEARS OF EXPERIENCE
40+

German **2011**
Environmental Award

Picture: WS burner REGEMAT® in double-p-tube. | »FLOX®« = »FLameless OXidation«: the registered trademark and patented technology of WS.

Best Available Industrial Burner Technology.

FLOX®



INNOVATIVE BURNER TECHNOLOGY

WS Wärmeprozessstechnik GmbH · Dornierstraße 14 · 71272 Renningen · Germany
Phone: +49 (71 59) 16 32-0 · E-Mail: ws@flox.com

WS Thermal Process Technology Inc. · 8301 West Erie Avenue · Lorain, OH 44053 · USA
Phone: +1 (440) 385 6829 · E-Mail: wsinc@flox.com



flox.com

WWW.HOMEOFSTEEL.DE

STEEL TECHNOLOGY

PSG's Mojave rebar micro-mill to set new benchmarks in green steelmaking

STEEL RESEARCH

Finland's prominent FutMet initiative aims to renew the entire steel production chain

STEEL DISTRIBUTION

New digital EPD tool cuts environmental data collection from months to minutes

STEEL PROCESSING

Assistance system measures the flatness of the strip after it has been cut to length



SMS  group

CSP[®] Nexus

REAL-BATCH AND ENDLESS PRODUCTION
FOR THIN-STRIP AND PLATE FORMATS



Learn more about Compact Strip Production:
www.sms-group.com/plants/csp-technology

On competitiveness and sustainability

On 15 September 2025, the European Parliament voted in favour of adopting its position on extending the Carbon Border Adjustment Mechanism (CBAM) to downstream steel and aluminium products. Stakeholders in the steel sector discussed this issue at length before and after the decision was taken. In this issue, both the European Steel Association (EUROFER) and EURO-METAL (the European Federation of Steel, Tubes and Metals Distribution and Trading) give their views (from page 15). Both associations share the view that the EU should do more to maintain the industry's competitiveness. Neither border adjustment mechanisms nor a well-intentioned action plan are sufficient to halt the migration of value chains. According to EUROFER President Henrik Adam, companies need "a competitive 'Made in Europe' industrial ecosystem".

Two examples of high-tech investment in sustainable steelworks can be found in the USA. Both projects are greenfield sites and rebar micro-mills. Firstly, Hybar has decided to build a duplicate facility alongside its existing steelworks in Arkansas (see page 20). Secondly, the Pacific Steel Group is constructing the first new steelworks in California for over 50 years, with environmental performance being a defining feature of this project (pages 33 ff.). Both projects claim to have one of the lowest carbon footprints in the long-product sector. In addition to scrap metal recycling and cutting-edge steel production technology, the production facilities utilise large on-site solar parks supported by a battery storage system. This clearly demonstrates a commitment to environmentally sustainable steel production, both now and in the future. As this magazine has a technical focus, the plant technology behind the

Californian project is explained in more detail on pages 36 onwards.

For some, digitalisation is just a buzzword, but the benefits are very real. Ovako, a specialist steel producer, has launched a new digital Environmental Product Declaration (EPD) tool which is said to be the first of its kind. It reduces the time taken to compile product-specific EPD data from months to minutes. It will enable customers to access robust, product-specific environmental data for any Ovako steel products they purchase. In my opinion, if it works, it's a 'no-brainer'.



Arnt Hannewald,
Dipl.-Ing., Editor

This issue features even more use cases and success stories, as well as clever solutions. Steel professionals work tirelessly to ensure that the steel industry is both competitive and sustainable. That is the future!

Enjoy reading!

Arnt Hannewald



- 33** The Mojave facility of Pacific Steel Group will be one of the cleanest of its kind thanks to its unique micro mill configuration

COMPANIES

15 EUROFER is calling for a new era of European industrial cooperation

Europe's steel industry asks for renewed cooperation with policymakers to build a more competitive and sustainable European Union

16 EUROMETAL responds to the extension of the EU's CBAM to downstream products

The EU Parliament took a step forward on CBAM downstream products, but Europe still falls short of a level playing field

18 World DRI production exceeds 150 million tons in 2025

The new record surpasses the previous year's figure by 7.2%

20 Hybar to build second rebar mill on site

The project enables twin mill operation by leveraging the existing infrastructure of the initial mill already in operation

STEEL TECHNOLOGY

31 Qualit test results for DR-grade pellets from Minnesota, USA

MagIron released the results from its pellet test programme

33 Pacific Steel Group to set new benchmarks in green steelmaking

A unique micro mill configuration will make the Mojave facility one of the cleanest of its kind

36 Minimill technology for green steel production

The concept of the MIDA QLP Hybrid Minimill is based on digital technologies and renewable energy integration

40 Finland's FutMet initiative to renew the entire steel production chain

The R&D project will develop electricity-based solutions combining EAF technology with modernised hot rolling processes

43 JSW Vijayanagar ramps up new steelmaking facilities in India

The new meltshop and slab casters at the new flat steel complex of the Toranagallu works

44 Hot strip quality management

Hydraulic rotary side guides installed at the downcoiler entry

45 Hot straightening machine commissioned at Salzgitter group company

The facility highlights the group's position as a prominent player in the infrastructure and wind energy sectors



46

New steel EPD tool cuts environmental data collection from months to minutes



36

58

GEORG introduces an assistance system for high-performance strip levelling machines



■ STEEL DISTRIBUTION

46 EPD – Environmental Product Declaration: the quick and easy way

Based on automated calculations a digital tool reduces months of manual work to a matter of minutes

48 The right tool for the job

How one forklift has delivered safe operations for decades

50 Automatic sawing technology with a lead

The new vertical bandsaw series from Kasto is more compact, energy-efficient, and easier to access

52 Global forecast of demand for electrical steel

A compound annual growth rate (CAGR) of 5.8% is projected for the global market for electrical steel

■ STEEL PROCESSING

58 Assistance system enhances quality of strip levelling

The solution measures the flatness of the strip after it has been cut to length

61 Are gas turbines ready for the hydrogen era?

Hydrogen affects superalloys at high temperatures

For supporting this issue we would like to thank our advertisers:

	Page
BEDA Oxygentechnik Armaturen GmbH	11
Coiltec Maschinenvertriebs GmbH	83
Danieli & C. Officine Meccaniche SpA	6, 7
IMS Messsysteme GmbH	13
Micro-Epsilon Messtechnik GmbH & Co. KG	19
SMS Group GmbH	2
Stein Injection Technology GmbH	84
Sudamin Rohstoff GmbH	9
Velco GmbH	21
WS Wärmeprozess Technik GmbH	1

**DIGIMELTER®/Q-ONE®
OR
DANIELI CORUS
BF+BOF**

Performances, operational reliability and quick startups are the result of 30 years of continuous R&D activities, carried out at the Danieli research center and onsite together with partnering customers. QSP-DUE can make use of more than 20 Danieli patents covering technological layouts, production equipment and Danieli Automation solutions, such as power, instrumentation and intelligent digital controls.

— The most efficient, digitally controlled electric steelmaking with no impact on the power grid.

DYSENCASTER®

— 6 m/min casting speed, allowing up to 4.5-Mtpy productivity on a single strand, with dynamic adjustment of slab thickness and width at any speed. In-mould fluidodynamic control with MultiMode Electromagnetic Mould Brake (MM-EMB) for no quality limitation.

**HYDROGEN-READY
AND ELECTRIC
TUNNEL FURNACES**

— Hydro-MAB burners ready for 100% hydrogen operations and electric tunnel furnaces for carbon-free slab reheating.

— Split mill layout, intensive cooling and dynamic transfer bar reheating for true thermomechanical rolling and endless operation of ultra-thin gauges.

**Q-HEAT®
INDUCTION
HEATERS**

— Danieli Automation robotics and artificial intelligence for zero-men on the floor.

— Least power-consuming process with the lowest carbon footprint.

— The most competitive plant in terms of CapEx and OpEx.

— The highest production flexibility due to three rolling modes available in a single line.

**COIL-TO-COIL
SEMI-ENDLESS
ENDLESS**

QSP-DUE®
ENDLESS
CASTING-ROLLING
PLANTS

UNIQUE
PATENTED DANIELI
TECHNOLOGIES

THE TRUE
AND ONLY ONES
PERFORMING
WORLDWIDE

SGJT and Yukun are enjoying their QSP-DUE plants operating in coil-to-coil, semi-endless and endless mode, based on HRC market requests. The Nucor Steel QSP-DUE plant is under construction.



DANIELI THE COMPETITIVE GREEN STEEL

ALAN LOVELL APPOINTED CHAIR OF BRITISH STEEL BOARD

The UK Government has appointed Alan Lovell as Chair of the British Steel board. Alan, who starts the role with immediate effect, has been acting as Chair of the UK Environment Agency since September 2022 and will be in post at the Agency until December 2026, combining duties with his new role at British Steel.

Allen trained as an accountant working with PWC, and has been finance director for several companies. In his executive career, Alan was Chief Executive Officer of six companies, including two in the renewable energy sector (Infinis in landfill gas and Tamar in anaerobic digestion) and three in the construction sector, including

Costain Group plc. In his non-executive career, Alan has been a Non-Executive Director and Chair at several companies and organisations including Interserve Group, Lloyd's of London, SIG, and the Consumer Council for Water.

I *British Steel*

CLEVELAND-CLIFFS APPOINTS NEW PRESIDENT AND CFO

Celso Goncalves has been promoted to president and chief financial officer of Cleveland-Cliffs and appointed to the company's board of directors.

Celso Goncalves has served as executive vice president and chief financial

officer since 2021 and has been with the company since 2016. As part of his recent promotion, Lourenco Goncalves, Cliffs' chairman and chief executive officer, will continue to lead the company as chairman

and chief executive officer, relinquishing the title of president.

I *Cleveland-Cliffs*

CHANGES ON THE BOARD OF QUAKER HOUGHTON

Mark A. Douglas has been elected as chairman of the board of directors of Quaker Houghton, succeeding Michael F. Barry.

Michael F. Barry, who retired as CEO four years ago, now decided to also retire

as chairman and a member of the board. Mark A. Douglas served as a director since 2013 alongside Michael F. Barry. In connection with Barry's retirement, the board

acted to reduce its size from eleven to ten directors.

I *Quaker Houghton*

SENIOR LEADERSHIP CHANGES AT STEEL DYNAMICS

The board of directors of Steel Dynamics, Inc. has approved that Theresa E. Wagler will become the company's president and chief executive officer.

This appointment becomes effective upon Mark D. Millett's retirement on Jan-

uary 1, 2027 as CEO and transition to executive chairman of the board of directors. Theresa E. Wagler has served as executive vice president and CFO since 2007. Richard A. Poinsett, the company's executive vice president and treasurer, will

succeed Wagler as the company's executive vice president and chief financial officer

I *Steel Dynamics, Inc.*

CHRISTOPH MARTIN TO SUCCEED BIRGIT POTRAFKI AS CFO OF SALZGITTER AG

Birgit Potrafki will not renew her contract as Chief Financial Officer (CFO) of Salzgitter AG, which expires on January 31, 2027, and will leave the company to pursue a new career opportunity. Christoph Martin will succeed her as CFO.

Christoph Martin has been active as a member of the Management Board of Salzgitter Mannesmann Handel GmbH and Salzgitter Mannesmann International GmbH since January 2025. He launched his professional career at thyssenkrupp

Steel Europe AG, where he subsequently held various controlling and finance positions.

I *Salzgitter AG*

BELGIUM

Registration for steelChallenge-21 open

steeluniversity, the education and training programme of the World Steel Association (worldsteel), has announced the opening of registrations for the 21st edition of steelChallenge.

steelChallenge is a game-based blended learning programme recognised by the global steel community as the preeminent competition for students and industry professionals to showcase their ability to produce high-quality steel at the lowest cost. With high school students now taking part, the competition is helping inspire the next generation of steelmakers.

The steelChallenge-21 Regional Championship will take place on 17 November 2026, starting at 12:00 UTC. Participants will compete in one of three categories: University Student, Industry, or High

School Student. Each competitor is placed in one of five global regions: Americas, Europe and Africa, Asia-West, Asia-North, and Asia-East and Oceania. Winners in the University Student and Industry categories for each region will qualify for the World Championship.

 worldsteel

FINLAND

Outokumpu produces biocoke in new agglomeration plant

Outokumpu has inaugurated its new agglomeration plant for biocoke in Tornio. The plant enables the replacement of fossil coke with biomass-based biocoke in ferrochrome production.

Agglomerated biocoke as a replacement for fossil coke (Photo: Outokumpu)



 **Sudamin
Rohstoff**
by Reconomy

We act. For you. *Worldwide.*

**Your partner for raw materials,
recycling of waste and residues.**

As an international service provider in recycling metalliferous waste and residues, we will find the best solution to serve your needs. Using our connections to the steel-, foundry and non-ferrous metals industry, we are trading and brokering raw materials, metallurgical and chemical products and con generic materials. As supplier of raw materials, it is our target to promote recycling and re-utilisation to contribute to an active protection of the environment.

The plant has the potential to reduce carbon dioxide emissions by up to 82,000 t per year when operating at full production capacity. The investment is part of Outokumpu's strategy to strengthen its sustain-

ability leadership in stainless steel and ferrochrome, and advance its climate targets. Biocoke is a key means of reducing the intensity of direct emissions. Outokumpu aims to reduce carbon dioxide

emissions across its value chain by 42% by 2030 from the 2016 baseline.

I *Outokumpu*

FRANCE

Gravithy to build direct reduction plant for green HBI production

Gravithy has contracted Danieli to supply a direct reduction plant to produce 2 million t/year of HBI by using mainly hydrogen and electric power. The plant will be installed in the industrial port area of Fos-sur-Mer.

The new plant will be based on the Energy-iron process jointly developed by Tenova and Danieli. Gravithy's new DRI plant will produce hot briquetted iron with a metallization up to 96%, and a carbon content of 1%, which is needed for the steel melting process. In addition to the use of hydrogen as reducing gas, the direct

reduction plant will feature electric process gas heating, further enhancing the efficiency and environmental compatibility of the direct reduction process. The plant is expected to start operation by the end of 2030.

I *Danieli*

GERMANY

IMS and Secopta combine expertise

IMS Messsysteme has acquired a stake in Secopta analytics, combining IMS Messsysteme's global expertise in high-precision measuring and inspection systems with Secopta's innovative LIBS-based material analysis solutions. The company will operate under the new name IMS Secopta GmbH.

With this investment, IMS Messsysteme, provider of X-ray, isotope and optical measurement systems, is specifically expanding its portfolio in the field of automated material analysis. Secopta analytics' solutions based on LIBS (laser-induced breakdown spectroscopy) technology are used in particular in the metals industry, in the recycling and waste recovery sector, in mining and in the raw materials and

glass industries. The ongoing expansion of electric steel production and the growing importance of scrap recycling are increasing demand for precise electromagnetic, optical and radiometric inspection systems, particularly for sorting scrap and construction waste.

I *IMS Secopta GmbH*

ITALY

Acciaierie Venete commissions bar straightening line

Acciaierie Venete has commissioned a second bar straightening line supplied by Danieli Centro Maskin for SBQ production at its Padova Works.

incorporation of Danieli's artificial intelligence to support operators and maintenance teams. Designed for demanding SBQ applications, the new straightening

line combines robust mechanical equipment with user-friendly automation.

I *Danieli*

The new line is designed to process special bar quality (SBQ) black bars with diameters up to 200 mm and yield strengths reaching 1,200 N/mm². The line integrates advanced Danieli Automation process control systems, featuring Industry 4.0-compliant connectivity. The system is designed for future integration with the Danieli condition monitoring system enabling predictive maintenance strategies, as well as the

Members of the Acciaierie Venete and Danieli teams after the successful commissioning of the new bar straightening line
(Photo: Danieli)



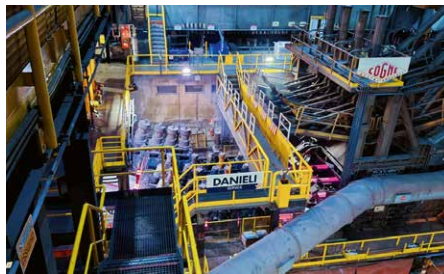
ITALY

Cogne Acciai Speciali revamps cooling chamber of bloom caster

Cogne Acciai Speciali has successfully completed the upgrade of the caster cooling chamber at its plant in Aosta. The revamping was executed by Danieli Service during a four-week summer shutdown.

The scope of Danieli's supply included the design and installation of a new stainless-steel cooling chamber in the caster's mobile curved zone, fully covering the wet area affected by secondary spray cooling. The chamber was preassembled at Danieli workshops and partially delivered to the plant in a pre-mounted arrangement, minimizing on-site activities during the shutdown.

As part of the revamping, a new central supporting structure was installed to sustain all fixed curved sections of the caster. This structure integrates new roller modules, new hoods engineered to improve heat containment and simplify operation and maintenance. It also includes new



Cogne Acciai Speciali's bloom caster after the cooling chamber upgrade

(Photo: Danieli)

extraction guides for all operational electromagnetic stirrers across the various casting lines.

By relocating all mechanical components outside the wet zone, the upgraded caster configuration significantly simplifies maintenance activities while improving component durability and extending service life.

| Danieli

Polytec acquires majority stake in Green Project

Italian company Polytec, specializing in the development of industrial robotics, automation and digitalization solutions for the metals sector, has acquired a 51% stake in Green Project Marking & Reading Systems.

Green Project is an Italian company with over thirty years of experience in the development of marking, automatic identification and traceability systems for the steel industry. Its integration with Polytec

will combine this know-how with Polytec's expertise in industrial robotics, process automation, machine vision systems and plant digitalization.

A key element of the transaction will be the enhancement of the respective identities and areas of expertise of the two companies. Green Project will continue to operate under its own brand, retaining its operational headquarters in Genoa.

| Polytec / Green Project

THE NETHERLANDS

Tata Steel Nederland takes next steps to reduce emissions of dust and noise

Tata Steel Nederland has applied for permits to construct covered storage facilities and a windbreak at several raw materials storage areas at its IJmuiden site. With these measures, the company

aims to significantly reduce emissions of dust and noise.

The permit applications relate to two ore blending yards and one scrap yard as well



**Excellence in
Oxygen Lancing**

beda.com/oxygen-lancing



BEDA
Oxygentechnik

as a new power supply & control installation. The approximately 21 m high wind-break and 400 m long, 94 m wide and 23 m high enclosures will significantly limit the spread of dust and noise generated during the unloading of scrap.

To further reduce dust dispersion, new conveyor belts will be fully enclosed. Addi-

tional misting systems will be installed at various locations on existing belts. For example, conveyor belts at the ore blending yards will be equipped with extra spraying systems to keep raw materials moist and prevent dust formation during transport. This process will be continuously monitored using sensors.

The measures are in line with the agreements set out in the joint letter of intent, concluded at the end of September 2025 between Tata Steel Nederland, parent company Tata Steel Limited in India, and the Dutch government.

■ *Tata Steel*

SPAIN

Hydnum Steel secures investment commitment to build clean steel plant

Hydnum Steel has secured a EUR 150 million investment commitment from the Co-investment Fund (FOCO), bolstering financial capacity to undertake the construction of its industrial complex in Puertollano (Ciudad Real), a project that will become the Iberian Peninsula's first clean steel plant.

Since its announcement in 2023, Hydnum Steel has continued to advance its technical and commercial development. Critical administrative hurdles have been overcome, such as the favourable resolution from the Guadalquivir Hydrographic Confederation for the hydrological adaptation of the surrounding area, and the securing of 500 MW of access capacity to the national electricity grid at the Brazatortas node. In accordance with its roadmap, the company plans to commence earthworks and construction by the end of this year.

The project has already received initial approval and has passed the public consultation phase without any significant objections, paving the way for it to be declared a Project of Exceptional Interest (PSI) by the Regional Government of Castilla-La Mancha. Furthermore, it has been recognised by the World Economic Forum in the field of industrial decarbonisation, and is supported by a consortium of specialised companies. Participating alongside Russula are the German multinational Siemens (providing solutions in digitalisation, automation, and cybersecurity), ABEI Energy (in renewable generation and green hydrogen), and metallurgical technology provider Primetals Technologies.

Hydnum Steel is designed as a digitally integrated plant that will completely eliminate fossil fuels, using instead electric arc furnaces powered by green hydrogen and 100% renewable energy. This production

model will enable a reduction in Scope 1 and 2 CO₂ emissions by up to 98% compared to traditional blast furnace methods. Moreover, the incorporation of endless strip production (Arvedi ESP) continuous rolling technology and a zero liquid discharge water treatment system which prevents discharges and promotes water reuse, further strengthens the facility's sustainable profile.

FOCO is a fund created by the Spanish Government with the aim to attract foreign capital to Spanish companies operating in areas such as the energy transition, digital transformation, mobility, sustainable agriculture and biotechnology. FOCO investments must include a contribution from a foreign co-investor. The fund is resourced by the NextGenerationEU instrument and managed by COFIDES, a state-owned mercantile company.

■ *Hydnum Steel*

Tuflesa to upgrade its ERW pipe welding line

Tubos y Flejes SLU, known as Tuflesa and part of the Bornay Group, has commissioned SMS group to modernize the sizing section of the electric resistance welding tube line at its production site in Las Torres de Cotillas, near Murcia.

Tuflesa has been using the ERW-RD-240 line, supplied by SMS group in 1998, for almost 30 years. The upgrade is aimed at securing the plant's long-term availability and improving product quality. After the modernization of the forming and welding area in 2024, this is the second upgrade project carried out by SMS group on the line.



The forming and welding area of Tuflesa's ERW tube line first upgraded in 2024
(Photo: SMS group)

SWEDEN

SSAB to invest in new processing line

SSAB has decided to invest in a new quenching line in Oxelösund, expanding the capacity of SSAB Special Steels' most profitable products in the segment of advanced wear and protection steels.

The new quenching and tempering line will initially add around 100,000 t/year to the capacity of SSAB Special Steels in the field of advanced wear and protection steels, such as Hardox 500Tuf and Armox. Compared with conventional steels, Har-

dox wear plate enables strong, lightweight designs that increase payload, improve uptime and reduce fuel consumption. Armox is a high-quality protection steel, offering a wide range of options for both civilian and defense applications. The production start of the new line is planned for 2030.

■ SSAB

SMS will now replace the line's four existing sizing stands as well as the related changeover equipment. The main drive, base frames, and changeover cars used for the automatic stand exchange will remain in service. The new sizing stands will restore the required accuracy, ensure more reliable compliance with product tolerance targets, and improve line productivity. Reusing these existing and adjacent components enables Tuflesa to reduce the overall scope of the upgrade. The new sizing stands will be supplied fully pre-assembled, wired and piped, thereby facilitating an efficient replacement process during the planned 2027 summer shutdown. In addition to supplying the equipment, SMS will supervise commissioning and assist in the start-up phase.

■ SMS group

SWEDEN

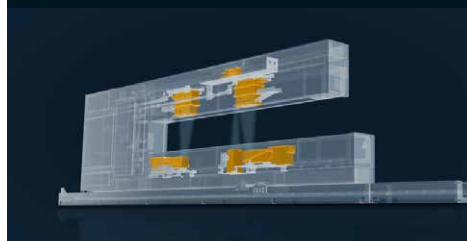
Stegra completes next financing round

In April, 2026 Stegra announced that the new financing round had been agreed in principle, subject to certain approvals, including customary regulatory approvals. This financing round has now been completed.

The EUR 1.4 billion financing round, led by a Wallenberg Investments-consortium, has strong support from existing investors as well as the original lender group. The Wallenberg Investments-led consortium consists of existing investors IMAS and Temasek as well as new investors Bolero and SEB-Stiftelsen. In addition, a large group of Stegra's existing shareholders continue to invest in the company. These investors include Altor, that will become the second largest shareholder, Hy24 and Just Climate, as well as AMF, AP2, Climate Infrastructure Fund, Kallskär, Kobe Steel, Lingotto Innovation, Scania, Schaeffler, Security Trading Stena Metall Finans and Swedbank Robur. The financing has also received 100% approval from the Stegra lender group. All banks participating in Stegra's financing package continue to support the project and the company will have access to the undrawn debt facilities



In the measurement of steel we set the benchmarks.



What do the world's largest steelmakers have in common? They have been relying on our measuring systems for years! And for good reason: our systems deliver utmost precision, even on shiny surfaces, in extreme heat and under the most adverse conditions.

From continuous casters to cold rolling mills: more than 4,500 IMS measuring systems worldwide ensure that good steel becomes perfect steel. Without touching the material, intelligently and with the highest precision.

IMS Messsysteme GmbH

ims-gmbh.de

established as part of the company's 2024 financing.

At the same time, Stegra has announced that changes have been made to its board of directors, following the closing of the financing round. The companies in the Wal-

lenberg Investments-led consortium together have an indirect majority shareholding in Stegra through Stegra Holding AB. Leif Johansson is the new chair of the board, representing the Wallenberg Investments-led consortium. Johansson suc-

ceeds Shaun Kingsbury who chaired the board of Stegra over the past several quarters and remains on the board. Henrik Henriksson will continue as CEO of Stegra.

■ *Stegra*

SWITZERLAND

Steeltec integrates new measuring system

Steeltec has successfully commissioned a new measuring system at its rolling mill in Emmenbrücke. The system, developed by Kocks and LAP, has been installed behind the existing Kocks RSB® reducing & sizing block.

The installation of the 4D Eagle S system ensures precision in both profile measurement and surface inspection for rounds with diameters ranging from 16 to 66 mm and hexagonal dimensions ranging from 17.7 to 62 mm. Combining cutting-edge laser technology with modern software solutions, the system captures comprehensive data of the rolled steel bars' profile and surface in real-time, feeding the results into the Smart Core X software for immediate display and further analysis. This allows Steeltec's operators to continuously monitor product dimensions and surface quality throughout the entire rolling process, ensuring superior quality assurance.



Advanced laser-based measuring system integrated in Steeltec's rolling mill
(Photo: Kocks / LAP)

■ *Kocks / LAP*

UNITED KINGDOM

Binding Solutions advances cold agglomerated pellet plant

Binding Solutions Limited (BSL) has secured memorandums of understanding covering iron ore supply and pellet offtakes, exceeding the capacity of its proposed 360,000 t/year first-of-a-kind cold agglomerated pellet (CAP) plant at HES International's HBTR terminal in Rotterdam.

The plant will combine BSL's proprietary processing and binder technology with

proven, industry-standard equipment to produce low-emission CAPs at temperatures below 150°C, delivering significant energy and emissions savings. The company is continuing to advance its plant design ahead of a final investment decision in 2027.

BSL has already successfully converted pellet fines from both blast furnace and direct reduction ore preparation processes into CAPs with low binder addition that

have specifications equivalent to seaborne indurated pellets. The CAPs demonstrated strong physical and metallurgical results in testing, indicating their suitability for re-introduction to steel making furnaces. BSL's technology provides an immediate low carbon and low capex alternative to re-circulate pellet fines into the furnaces.

■ *Binding Solutions Limited*

EUROPEAN ECONOMY

EUROFER is calling for a new era of European industrial cooperation

75 years after coal and steel helped lay the foundations for European integration, Europe's steel industry has called for renewed cooperation with policymakers to build a more competitive and sustainable European Union

Steel industry leaders, European policymakers and representatives from across Europe's industrial value chains gathered in Brussels on 9th September 2026 to mark the 75th anniversary of the Treaty of Paris and the 50th anniversary of the European Steel Association (EUROFER), with European Commission Executive Vice-President Teresa Ribera as guest of honour.

Signed on 18 April 1951 by six European nations, the Treaty established the European Coal and Steel Community (ECSC), putting industrial cooperation at the heart of a new European project built on peace and shared prosperity. Henrik Adam, President of EUROFER, said: '75 years ago, Europe understood that industry, prosperity and peace were interconnected. Today, competitiveness, climate, security and social cohesion are equally connected. The EU has made an important political choice: it wants to maintain a strong industrial base

Europe cannot afford to fall behind while other major economies strengthen their industries.

Henrik Adam, President of EUROFER

and continue making steel in Europe. We welcome that commitment. Now we need to turn ambition into results."

European Commission Executive Vice-President Teresa Ribera said: "Europe's industrial strength and its sustainable future must go hand in hand. We

want companies to invest, innovate and create good jobs here in Europe. The EU's responsibility is to help create the conditions for that transformation, and it is industry's responsibility to deliver it. 75 years after the Treaty of Paris, that spirit of partnership remains essential to ensuring that European industry decarbonises and competes globally."

During his speech, EUROFER's President welcomed the significant progress made by the EU, including the Steel and Metals Action Plan, while stressing that this was only one step towards delivering a deeper industrial transformation on the ground. This will require strengthening industries across the value chain to build a competitive "Made in Europe" industrial ecosystem, while significantly reducing energy costs. Competitive and affordable energy, he stressed, is essential if European industry is to decarbonise while continuing to produce and invest in Europe.

President Adam concluded: "European steel is ready to play its part. Europe cannot afford to fall behind while other major economies strengthen their industries. If Europe wants to remain a global force, it needs the industrial strength to do so."



On 9 September 2026, steel industry leaders, European policymakers, and representatives from across Europe's industrial value chains gathered in Brussels. The guest of honour was European Commission Executive Vice-President Teresa Ribera. (Picture: EUROFER)

EUROFER

EU CARBON BORDER ADJUSTMENT MECHANISM

EUROMETAL responds to the extension of the EU's CBAM to downstream products

On 15 September 2025 the EU Parliament took a step forward on CBAM downstream products, but Europe still falls short of a level playing field. A statement from EUROMETAL – the European federation of steel, tubes and metals distribution and trading



On 7 September, companies, workers, business associations and industrial stakeholders from across Europe gathered in Brussels for the European Convoy for Industrial Competitiveness, a peaceful initiative calling for policies that strengthen European manufacturing, safeguard investment and support quality jobs (Picture: EUROMETAL)

The European Parliament's adoption of its position on the extension of the Carbon Border Adjustment Mechanism (CBAM) to downstream steel and aluminium products represents an important recognition of a problem that EUROMETAL and the wider European manufacturing value chain have highlighted for years: carbon leakage has moved downstream.

Goods manufactured outside the European Union from steel and aluminium increasingly enter the EU market while avoiding carbon costs borne by European industry. Parliament's decision is therefore a welcome signal that policymakers are beginning to acknowledge the reality faced

by European manufacturers, processors, service centres, distributors and traders.

However, while the direction is correct, the proposal remains insufficient to restore fair competition for Europe's industrial value chains. "Today's vote is a step in the right direction, but it does not yet deliver a level playing field for European industry," said Alexander M. Julius, President of EUROMETAL. "The proposed scope remains incomplete, implementation is too slow, and there is still no solution for EU exporters carrying carbon costs when competing globally. Moreover, CBAM alone cannot offset the broader cost disadvantage faced by European manufacturers due to higher steel prices and regulatory bur-

dens. Europe must protect the entire value chain if it wants to prevent carbon leakage and deindustrialisation."

An incomplete product scope leaves major loopholes open

The fundamental challenge is not whether CBAM should cover downstream products. It should.

The challenge is that the proposed extension remains far from comprehensive. Even with the significantly expanded product list supported by Parliament, large numbers of steel-containing and aluminium-containing goods remain outside the scope of CBAM.

Every product category left outside the mechanism becomes a potential circumvention route. Global suppliers will naturally redirect production towards categories that remain exempt, moving additional processing steps outside Europe while continuing to access the EU market. This risks creating a shifting landscape of carbon leakage rather than preventing it.

EUROMETAL has consistently argued that carbon leakage is no longer limited to primary steel and aluminium. It increasingly occurs through components, assemblies, equipment and finished goods where embedded steel is only one element of the final product. A partial extension therefore risks moving the problem rather than solving it. The scope should ultimately cover the full spectrum of steel-intensive and aluminium-intensive products where significant embedded emissions are present.

The timeline comes too late for Europe's industry

The second major concern is timing. European manufacturers are already facing the

We are not asking for subsidies or special treatment. We are asking for fair competition.

Alexander Julius, President of EUROMETAL

consequences of regulatory asymmetry. Production relocations, weakening investment decisions and rising imports of steel-intensive manufactured goods are occurring today, not in several years' time. EUROMETAL has repeatedly highlighted the growing import penetration of downstream products and the resulting pressure on European industrial value chains.

A delayed implementation risks allowing further erosion of Europe's manufacturing base before effective corrective measures are in place. Businesses make investment decisions years in advance. Every additional year during which loopholes remain open creates incentives to establish production outside the EU while continuing to serve the European market.

The objective of CBAM is to prevent carbon leakage. If meaningful coverage arrives only after substantial leakage has already taken place, Europe risks protecting emissions accounting while losing industrial capacity.

No answer yet for EU exporters

Perhaps the most significant structural weakness remains untouched. European manufacturers producing for global markets continue to pay EU ETS-related carbon costs directly or indirectly through their material inputs. When they compete in export markets against producers located in countries that apply no equivalent carbon costs, they do so at a competitive disadvantage.

The current CBAM debate focuses almost exclusively on imports. Yet European industry also competes outside Europe.

A European machinery manufacturer exporting to Asia, Latin America, Africa or North America cannot recover the carbon costs embedded in steel and aluminium purchased within the EU. Meanwhile foreign competitors frequently face no comparable burden. The result is an export handicap for EU industry.

Until a credible mechanism exists to neutralise carbon costs for exports while remaining compliant with international trade obligations, Europe will continue to expose its manufacturing sector to an uneven global competitive environment.

Climate policy must address both sides of competitiveness: imports into Europe and exports from Europe. Today, only one side of that equation is partially covered.

CBAM alone cannot restore competitiveness

Even if the downstream CBAM extension were comprehensive and immediately effective, it would still address only one element of the cost gap faced by European manufacturers.

Steel consumed by European industry carries a range of regulatory costs that are not fully reflected in the price structures of many competing non-EU suppliers. Carbon costs are only part of the equation.

A particularly important unresolved issue remains the interaction between CBAM and trade defence measures. Anti-dumping duties, anti-subsidy measures and safeguard-related restrictions continue to contribute to a structurally higher steel price level within the European market. Meanwhile, manufacturers outside the EU often source steel at significantly lower global market prices.

As a result, an imported finished product may continue to enjoy a substantial competitive advantage even when CBAM obligations are applied. The producer has benefited from lower steel input costs throughout the manufacturing process, while European manufacturers have carried both higher material costs and higher regulatory costs. This creates a fundamental imbalance. Europe is effectively applying carbon correction only to one component of a wider competitiveness challenge.

EUROMETAL has therefore consistently called for a coherent value-chain approach that addresses not only carbon leakage but also regulatory asymmetries affecting the broader manufacturing ecosystem. Measures that apply to steel must not create incentives for the importation of steel-containing products manufactured elsewhere.

Europe needs a value-chain strategy

The European Parliament's position is an important acknowledgment that carbon leakage has moved beyond primary materials and into downstream manufacturing. This recognition deserves support.

Nevertheless, Europe should avoid the mistake of considering the problem solved. To safeguard industrial competitiveness, policymakers must:

- › Extend CBAM coverage to all relevant steel-intensive and aluminium-intensive products.
- › Accelerate implementation timelines.
- › Develop an effective solution for EU exporters bearing carbon costs in global competition.
- › Address the cumulative impact of trade defence measures and other regulatory cost burdens throughout the manufacturing value chain.
- › Ensure that climate policy protects industrial activity within Europe rather than encouraging its relocation.

A truly effective industrial policy must protect the entire European value chain, from steel production and distribution to processing, manufacturing and exports. Anything less risks reducing Europe's emissions on paper while exporting jobs, investment and industrial know-how in practice.

Europe does not need carbon leakage to become more sophisticated. It needs climate and trade policies that finally recognise how modern industrial value chains actually work.

EUROMETAL is the European Federation of Steel, Tubes and Metals Distribution and Trading. It represents companies active throughout the European steel and metals value chain and advocates for competitive, sustainable and resilient industrial markets across Europe.

EUROMETAL

IRONMAKING

World DRI production exceeds 150 Mt

Global direct reduced iron (DRI) production in 2025 reached a new record of 151.0 million tons, surpassing the previous record of 140.8 million t set in 2024 by 10.2 million t, or 7.2%. Since 2020, worldwide annual DRI production has increased by 46.2 million t (44.0%), reflecting continued growth in both gas-based shaft furnace and coal-based rotary kiln production.

Each year Midrex Technologies, Inc. compiles and publishes World Direct Reduction Statistics as a resource for the global iron and steel industry. World Steel Dynamics (WSD) audits the data collection and preparation processes used by Midrex to confirm that the methodology and accuracy of the data to be published is representative of the global direct reduction industry in a given year.

Sets a fifth straight annual production record

Annual global direct reduced iron (DRI) production reached 151.0 million tons in 2025, up 10.2 million t (7.2%) from the previous record of 140.8 million t set in 2024. Growth was led primarily by rotary kiln-based production in India, which increased by 4.5 million t (9.8%), while gas-based

shaft furnace output rose by 5.8 million t (6.1%). Together, India and Iran accounted for more than 63% of global DRI production, with year-on-year increases of 7.4% and 9.0%, respectively. New natural gas-based capacity came online in Bolivia, and continued expansion supported growth in Algeria, India and Iran.

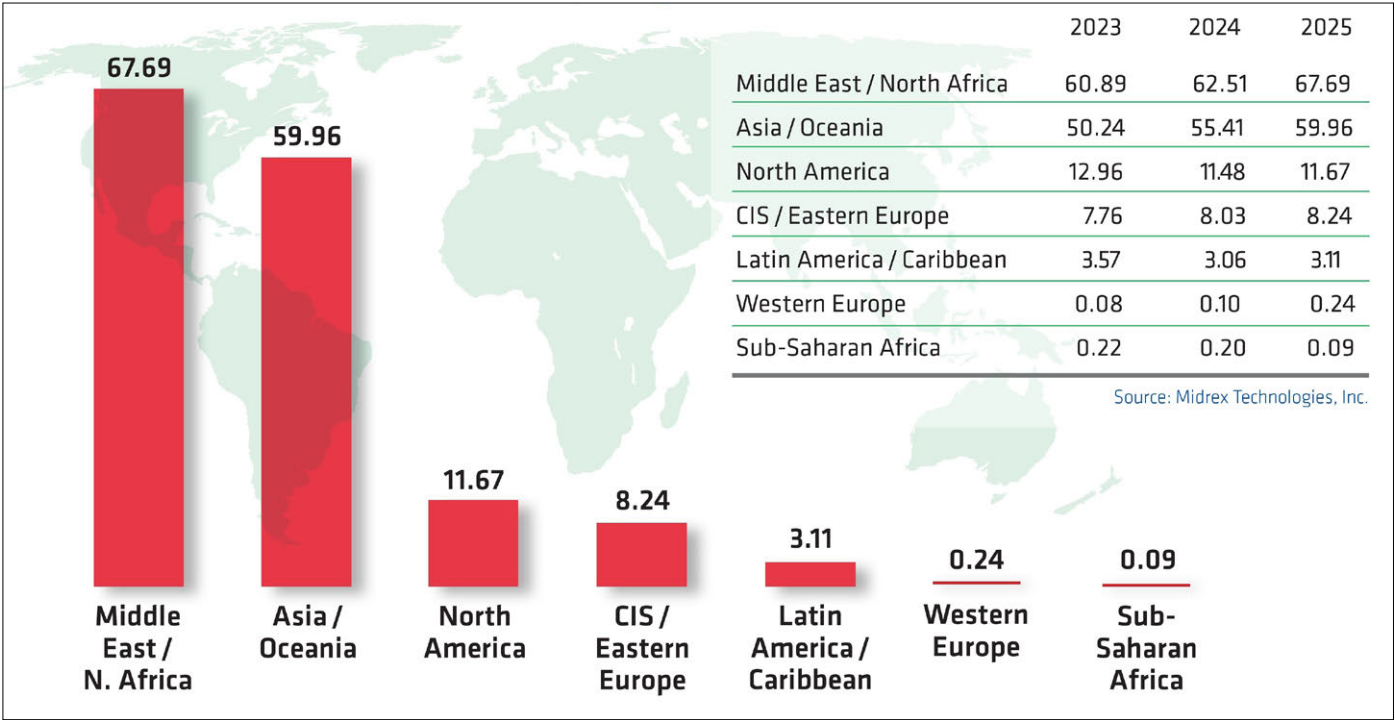
Since 2020, worldwide DRI output has grown by 46.2 million tons per year (t/year), or approximately 44.0%. Over the same period, natural gas-based DRI production grew by 21.8 million t/year (27.5%) and coal-based rotary kiln DRI production (in India and South Africa) increased by nearly 24.6 million t/year (97.4%). In the last decade, DRI production has grown by 78.4 million t/year, or approximately 107.9%, or a compounded annual growth rate of 7.6%. Over those 10 years, shaft furnace production increased by 43.5 mil-

lion t/year (75.8% or CAGR 5.8%), and rotary kiln production increased by 35.3 million t/year (239.3% or CAGR 13.0%).

Breakdown by origin. In 2025 Top 5 DRI producing nations led the statistics as following:

- > India 58.8 million t
- > Iran 37.2 million t
- > Russia 8.2 million t
- > Algeria 6.7 million t
- > Saudi Arabia 6.6 million t

As in previous years, India continued to be the largest DRI producer worldwide, producing a record 58.8 million t of DRI, a 7.4% year-on-year increase according to the Sponge Iron Manufacturers Association (SIMA) of India. India's DRI production includes 49.9 million t from coal-based rotary kilns, an increase from 45.5 million t in 2024, and 8.9 million t by gas-based pro-



2025 world DRI production by region (Picture: Midrex)

cesses, a decrease from 9.4 million t in 2024. Rotary kiln DRI production increased 9.8% year on year and by 24.6 million t/year over five years, equivalent to a five-year CAGR of 14.6%. Coal-based DRI production in India constitutes most of the high CO₂ DRI produced worldwide in 2025.

Production of DRI in Iran was 37.2 million t, a 9.0% increase from 34.1 million t in 2024. All Iranian DRI production is from natural gas-based processes. The MIDREX Process accounts for approximately 90% of DRI production in Iran, while PERED® plants produced an estimated 3.5 million t in 2025.

Breakdown by products. The production of hot DRI (HDRI), which is fed directly to a nearby melt shop for energy savings and productivity gains, was 20.6 million t, a 21.4% increase compared to 2024, and made up 13.6% of the total DRI produced in 2025. The production of hot briquetted iron (HBI) – a compacted form of DRI ideally suited for shipping to Electric Arc Furnaces and Blast Furnaces – is estimated to have been 11.6 million t, a 4.1% increase over 2024. HBI makes up 7.7% of all DRI produced.

Reducing gas. Natural gas is generally the main source of reducing gas in shaft furnace-based processes, and DRI produced using natural gas has significantly lower CO₂ emissions than DRI produced using coal directly in rotary kilns, or indirectly in shaft furnaces using coke-oven gas, COREX® gas, or coal gasification. For plants using a combination, DRI production is pro-rated on an energy basis. In 2025, approximately 65.1% of the DRI produced was natural gas-based (i.e. low CO₂ DRI), whereas the balance, 34.9%, was coal-based (i.e., high CO₂ DRI). The proportion of low CO₂ DRI has steadily decreased in the last 5 years due to the faster growth in DRI produced in India via rotary kilns.

Source data. The total DR production for 2025 was calculated using gas-based operations outside Iran and Russia, rotary kiln production in India reported by SIMA, and data reported by the World Steel Association. MIDREX® plants produced 82.3 million t of DRI in 2025, which is 8.0% more than the 76.2 million t produced in 2024, both annual records. The MIDREX® process accounted for 54.5% of total DRI produced, and 81.5% of the DRI produced in shaft furnaces. Approximately 16.7 million

t of HDRI and 10.5 million t of HBI were produced by MIDREX plants in this period, representing 80.9% and 90.1% of HDRI and HBI annual production, respectively.

Iron ore supply and pricing. For DRI producers, the most relevant pricing indicators are not lower-grade fines indices alone, but the pricing of high-grade iron ore and DR-grade pellets used for direct reduction. DR-grade pellet pricing is generally linked to high-iron, low-gangue feedstock values, plus a pellet premium that reflects product quality, availability, logistics, and regional demand.

In 2025, iron ore supply was generally stable and did not have a major impact on DR production worldwide. Seaborne iron ore pricing remained range-bound compared to the volatility seen in previous years. High-grade pellet premiums trended downward in the second quarter before stabilizing around first-quarter levels.

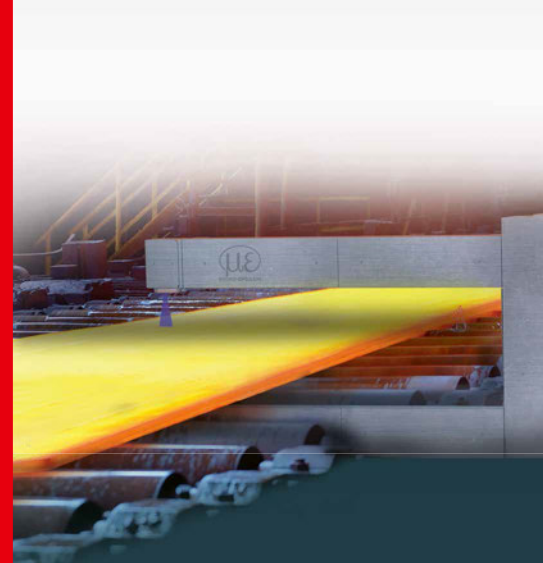
Crude steel production remains a key proxy for steel demand. Demand for DRI-based steelmaking remained comparatively resilient, supported by the continued use of orebased metalics in EAF operations and decarbonization related planning. However, weaker steel pricing, uneven utilization, and regional trade pressures continued to weigh on margins throughout the year.

International trade of DRI. Total shipments of DRI – including both domestic and international shipments – increased to 30.4 million t in 2025, or 6.3% more than last year, establishing a new record. Land shipments made up the majority of the total in 2025, amounting to 20.0 million t, an 8.8% increase over the 18.4 million t reported for 2024. Water shipments showed a 1.9% increase compared to 2024, totaling 10.5 million t.

International trade routes were estimated from trade data to be 10.8 million t, a decrease from 11.7 million t in 2024. Accounting for missing data from sanctioned countries, international DRI trade was more likely around 13.2 million t in 2025, a slight decrease from the 13.3 million t estimated in 2024.

Trade in DRI products in 2026 is expected to differ materially from 2025 due to conflicts and shipping restrictions affecting both iron ore and DRI products. Trade regulations, tariffs and sanctions will also have a significant impact on global trade.

■ Midrex Technologies, Inc.



More Precision Laser thickness measurement in hot mills

C-frame laser gauges now also
for hot mill applications:

- Thickness up to 400 mm
- Temperature up to 1200 °C
- Accuracy ±5 microns
- Patented Blue Laser Technology



Micro-Epsilon laser gauges established in hot mills, cold mills and processing lines

Contact our application engineers:

Tel. +49 8542 1680

micro-epsilon.com/metal

CAPACITY EXPANSION

Hybar to build second rebar mill on site

The new greenfield project in Arkansas (USA) enables twin mill operation by leveraging the existing infrastructure of the initial mill already in operation. It is designed to achieve one of the lowest carbon footprints in the long-product sector.

Hybar LLC, a scrap metal recycling and steel production company focused on environmentally sustainable steel production, has again selected SMS group to supply a second continuous minimill technology order (CMT® 550) for its steel-making complex in Osceola, Arkansas (U.S.). Groundbreaking for the project is expected to take place in late 2026 with start-up scheduled twenty-four months later.

“Building on the success of our first CMT® mill at Hybar’s Osceola site to produce long products, we see huge potential to expand our capacities here at Osceola by combining logistics and labor expertise already on-site with this CMT® twin solution. This enables us to effectively respond to the increasing demand for green long products by taking advantage of shared utility costs,” says David Stickler, CEO Hybar.

The expansion project enables optimal use of transport logistics and a shared connection to the same renewable power source. Utilizing the site’s 105-megawatt solar park, supported by a 160-megawatt-hours battery storage system, mill operation is designed to achieve one of the lowest carbon footprints in the long-product

sector. Compared to a conventional minimill, carbon emissions are expected to be reduced by up to 35 percent.

The new CMT® 550 mill is integrating steelmaking, casting, and rolling into a single, exceptionally reliable process. The new mill expands Hybar’s reinforcing bar production by an additional 570,000 t (630,000 short tons) per year, producing bars from 12.4 to 35 millimetres in one to four-ton bundles.

The meltshop features an EAF based on the proven EDGE DC design platform and a twin ladle furnace station. The X-Pact AURA, an advanced electronics system, provides the electrical power feed to the melting unit, enabling high productivity (>80 tons per hour) with low energy consumption and minimal impact on the electrical grid. A comprehensive digital package ensures plant-wide acquisition of real-time and production data, feeding the DataXpert platform to provide advanced logic and develop machine learning models for equipment monitoring and smart operation.

A hallmark of the CMT® concept is the seamless integration of casting and rolling into one continuous production process. A

high-speed single-strand endless caster with CONREX mould tube technology connects the meltshop to the rolling mill via an induction equalization furnace, reducing dependence on fossil-fuel reheating furnaces.

Building on the operational success of Hybar’s first CMT® 550 mill, SMS has established a lifecycle partnership model combining on-site expertise with comprehensive support. A dedicated SMS expert is embedded at the Osceola site to coordinate tailored solutions. With early engagement starting 14 months before commissioning, SMS has forecasted consumables demand, optimized spares inventories, and customized rolling guide solutions. The same proven approach is now being extended to support the twin CMT® system and strengthen equipment reliability.

Leveraging the experience gained from Hybar’s first CMT® 550 mill in Osceola, SMS group will support project execution and commissioning to reduce startup risk and accelerate the transition to profitable production.

■ *SMS group*



Hybar’s first minimill in Osceola, Arkansas, connected to the company’s own solar park (Picture: supplied by SMS group)



Danieli Group CEO Giacomo Mareschi Danieli (middle) together with representatives from Danieli and GSM Tanzania after signing the contract at the Danieli headquarters (Picture: Danieli)

AFRICA – TANZANIA

GSM Tanzania orders new rebar and wire rod mill

Advanced rolling technologies for competitive production and high-quality long products in East Africa

GSM Tanzania Limited awarded a contract to Danieli for supply of a new rebar and wire rod mill, to be installed in the Kilimanjaro Industrial Park, in Tanzania. The project represents a strategic investment aimed at strengthening GSM's position in the regional steel market while supporting the country's growing demand for construction and infrastructure products.

The new mill will process 150x150-mm billets at a production rate of up to 50 tons per hour. Designed to serve the key requirements of the East African construction sector, the plant will produce approx. 300,000 tons per year of deformed reinforcing bars ranging from 8 to 32 mm and smooth wire rod in the 5.5- to 6.5-mm size range.

Danieli's scope of supply includes the complete rolling mill technological package, featuring 14 cartridge-type GCC stands, a BGV 10-pass finishing block, an in-line quenching and tempering system, and a twin-channel high-speed delivery system to the cooling bed for the rebar line.

The wire rod line will be equipped with an in-line QTR system and Danieli's patented oil-film bearing laying head, combined with a cooling conveyor to ensure high operational stability and excellent coil quality.

The entire plant will be controlled by Danieli Automation systems, ensuring reliable operation, advanced process control, consistent product quality, and simplified maintenance.

The plant has been specifically engineered to achieve competitive production costs, reduced energy consumption, and superior finished-product quality while meeting the evolving requirements of the fast-growing East African steel market.

I Danieli

AMERICAS – CANADA

Tenaris to expand Sault Ste. Marie facility

The Government of Canada has announced a CDN\$ 76.2 million investment through the Strategic Response Fund in Tenaris's CDN\$ 305.9 million project to modernize its Sault Ste. Marie Industrial Centre.

The current investment will enable Tenaris to acquire new equipment, increase automation and upgrade existing produc-

50 Years
VELCO
www.velco.de

GUNNING ROBOTS FOR IMPROVED HOT REPAIR of EAF, Ladle, RH



VELCO GmbH

Haberstraße 40

42551 Velbert (Germany)

info@velco.de • www.velco.de

Tel +49 (20 51) 20 87-0

tion lines at its Sault Ste. Marie facility. Besides expanding the production of tubular products for oil, gas and industrial markets, the company will also introduce advanced technologies and digitalization, enabling the production of high-spec

seamless tubular products designed for complex operating environments.

This project is in line with the Canadian government's strategy to invest in the long-term sustainability of the country's manufacturing base and strengthening

domestic supply chain security for key energy and infrastructure applications.

| *Tenaris*

AMERICAS – MEXICO

Talleres y Aceros starts up new SBQ plant

Talleres y Aceros has successfully completed the start-up of its new 350,000 t/year SBQ plant in Ixtaczoquitlán, Orizaba, supplied by Danieli. The overall plant layout also includes a new drawing line and a heat-treatment line, which are currently in the final stages of installation.

The new facilities comprise a complete SBQ production complex featuring a state-of-the-art hot-rolling mill equipped with an innovative four-pass, four-roll sizing block, straightening and peeling lines and a complete

water-treatment plant. Cold commissioning activities of the new installation started in early April 2026, validating auxiliary systems, automation sequences and service infrastructures. The first bar processed through the DSD (Draw Sizing Danieli) sizing block on July 6 confirmed the specified dimensional accuracy, stable rolling parameters and equipment reliability. The provisional acceptance certificate was signed on August 4. From the first days of operation, the plant has been producing sellable SBQ profiles, including bars and flats.



Billet heating at Talleres y Aceros
(Photo: Danieli)

| *Danieli*

AMERICAS – PERU

Aceros Arequipa orders tube mill and finishing equipment

Aceros Arequipa has contracted Fives to supply a complete OTO tube mill with integrated finishing equipment for its plant in Lima. The scope of supply includes the entire production line, from the entry section to packaging and strapping.

The new OTO tube mill, designed, supplied, and installed by Fives, will produce tubes for construction and structural applications. The line will handle wall thicknesses of up to 2 mm and diameters up to

40 mm. It will also feature a state-of-the-art packaging section, enabling Aceros Arequipa to produce tube bundles at very high speed. Advanced software packages will support operators in both equipment operation and preventive maintenance activities. The fully automated workflow minimizes manual intervention, reducing operator exposure to risk and enhancing overall plant safety.

| *Fives*



Aceros Arequipa will produce up to 40 mm tubes on its new OTO mill (Photo: Fives)

AMERICAS – TRINIDAD AND TOBAGO

Launch of Pinnacle Steel and Vanadium redevelopment project

Private investment firm Heeney Capital, lead investor in Pinnacle Steel and Vanadium, welcomes the official launch of the refurbishment of the former Arcelor-Mittal steel facility in Point Lisas.

The ribbon-cutting ceremony marked a significant milestone in the project's development and revitalization, and advances a

vision to transform the facility into one of the most technologically advanced producers of steel and vanadium. Pinnacle has announced plans to establish advanced and environmentally responsible steel production facilities while creating valuable jobs and positioning Trinidad and Tobago as a strategic hub for critical mineral production.

Heeney Capital is a U.S. private investment firm focused on critical minerals, strategic resources, and industrial supply chains.

| *Heeney Capital*

AMERICAS – USA

Big River Steel to build direct reduction plant

Midrex Technologies has been selected by U. S. Steel to supply a 2.5 million t/year HDRI/HBI Midrex® plant for the company's new direct reduced iron facility at Big River Steel Works in Osceola, Arkansas.

The Midrex Flex® plant will supply high-quality hot direct reduced iron (HDRI) to adjacent electric arc furnaces while also producing hot briquetted iron (HBI) for

merchant sales and export to steelmaking facilities worldwide. Feeding hot DRI directly to an EAF provides many benefits including reduced energy consumption, higher productivity in the EAF, lower operating costs, and reduced emissions intensity. HBI is increasingly valued throughout the global steel industry as a premium, low-residual metallic feedstock that improves steel quality, is safer to ship due to its lower reactivity, experiences less

yield loss in transit thanks to minimal metallization loss and high physical strength, and supports lower-emission steel production pathways.

The project will establish the first DRI facility of its kind in the United States integrated with EAF steelmaking and a domestic DR-grade pellet supply chain. First production is expected in 2029.

■ *Midrex*

Cleveland-Cliffs to invest in Middletown Works optimization

Cleveland-Cliffs optimization project for its Middletown Works represents a US\$ 1 billion total investment, with funding shared equally between Cleveland-Cliffs and the U.S. Department of Energy.

The investment is expected to be deployed over the next four years as while maintaining uninterrupted steel production. The

Middletown Works investment includes state-of-the-art upgrades to its blast furnace, advanced material handling infrastructure, and artificial intelligence-enabled process control technologies. A key component of the project is the construction of an advanced cogeneration facility that will capture and utilize blast furnace gas to generate electricity and steam for on-site con-

sumption. This will improve overall energy efficiency, reduce reliance on externally supplied electricity, and lower operating costs. This multi-year investment is expected to commence in the coming weeks, with completion of the blast furnace rebuild planned for the first quarter of 2030.

■ *Cleveland-Cliffs*

Metallus expands production capabilities

Metallus has officially commissioned the new manufacturing assets installed at its Gambrinus facility in Canton, Ohio, with a ceremonial ribbon cutting event.

The new bloom reheating furnace, roller furnace and supporting equipment will expand the company's production capabilities, improving operational efficiency, enhancing product quality and increasing manufacturing flexibility. The investment was supported through a funding commitment from the U.S. Army, and workforce and economic development support from

Ribbon cutting ceremony at Metallus for the newly installed production equipment
(Photo: Metallus)



JobsOhio. Metallus manufactures high-performance specialty metals from recycled scrap metal in Canton, OH, serving demanding applications in industrial, auto-

motive, aerospace and defence, and energy end-markets.

■ *Metallus*

NEMO Industries selects DRI technology upstream a future electric smelting facility

NEMO Industries has selected Tenova as technology provider for a new direct reduction plant to be built in Louisiana. The plant will be based on the Energiron DRI technology, jointly developed by Tenova and Danieli.

Tenova will start developing the front-end engineering design (FEED) as the project advances toward the final investment decision, expected in December 2027. The plant will feature the Hytemp hot DRI transport system and will be prepared for the future integration of carbon capture solutions. The facility's design incorpo-

rates pathways for future hydrogen use. NEMO Industries will utilize the Energiron Zero Reformer configuration to produce 2.5 million t/year of DRI to feed its new electric smelting pig iron project plant.

■ *Tenova*

AMERICAS – USA

Plibrico acquires refractory company F.S. Sperry

Plibrico, a manufacturer of monolithic refractories, precast shapes, and engineered refractory solutions, has acquired refractory service and materials supplier F.S. Sperry.

Built on a long-standing partnership and shared values, this acquisition brings together F.S. Sperry's regional expertise with Plibrico's manufacturing, engineering and technical resources to strengthen support for high-temperature industrial oper-

ations through dependable refractory solutions, responsive service, and enhanced technical capabilities.

| Plibrico

Steel Dynamics to modernize hot strip mill in Butler, Indiana

Steel Dynamics, Inc. (SDI) has commissioned SMS group to complete a comprehensive upgrade of the process automation system at its hot strip mill in Butler, Indiana.

By replacing aging hardware and legacy models with state-of-the-art technologies, SDI continues to ensure that the hot strip mill, originally supplied by SMS group in 1993, remains highly productive, easy to maintain, and reliable for years to come.

The new X-Pact® level 2 system integrates advanced process models developed by SMS group, modern ProconTEL-based communication architecture, and the intuitive X-Pact® Vision webHMI to support high-precision rolling, improved strip geometry control, and consistent product quality. In the finishing mill, the X-Pact® PCFC model calculates the ideal set points for the CVC® plus (continuous variable crown) and work roll bending systems, ensuring excellent profile, contour, and flatness control across SDI's full

product range. With highly precise cooling strategies for a wide range of hot rolled products, X-Pact® Cooling Section Control ensures consistent, repeatable material properties. It enables variable coiling temperatures along the strip and provides in bar temperature control from head to tail. First coil production with the modernized system is scheduled for late 2026, with the final acceptance certificate targeted for early 2027.

| SMS group

Searing Industries to upgrade production facilities

Welded tubing manufacturer Searing Industries has awarded Fives contracts for a complete OTO tube mill and innovative entry lines, including new robotic shears and end welders, and a debander.

The fully automated shears and end welders will ensure maximum flexibility in cutting cycles, improve machine accessibility and maintenance, and reduce the overall footprint. Additionally, a new debander easily adapts to various coil types and plant

layouts by automatically removing straps from incoming coils. During strap detection, the system verifies the coil's diameter and width, the strap's width, and the spacing between straps, issuing alerts in case of anomalies. This reduces the number of operators required and significantly lowers health and safety risks. The technology is fully integrated with digital solutions, including AI modules, to optimize process performance and provide operators with real-time feedback during daily operations.



Production facilities of welded tubing manufacturer Searing industries (Photo: Fives / Searing Industries)

| Fives

SSAB and partners launch closed-loop steel recycling initiative

SSAB Americas, The Greenbrier Companies and Alter Trading are partnering on a circular economy project that demonstrates how recycled materials can be used to produce near-zero emissions steel and returned to the supply chain for new steel making.

The effort begins at SSAB's Iowa operations where SSAB's near-zero emissions steel, SSAB Zero™, is produced from recycled metals and fossil-free energy. Greenbrier is currently using SSAB Zero™ steel

to produce 50 gondola railcars, which will be delivered to Alter. Once delivered, recycled metals loaded on gondolas will be returned to SSAB and offloaded to produce new steel. This successful collaboration relies on documented production processes, physical logistics, and material traceability, without the use of offsets. Subsequent updates will document fabri-

cation, operational use, and the return of recycled metals to steelmaking.

| SSAB / The Greenbrier Companies / Alter Trading

Recycled metals are transported in railcars to the steelmaking site (Photo: SSAB)



AMERICAS – USA

The Systems Group launches HVAC division for steel industry

The Systems Group (TSG) has established Systems Cool Air Solutions, a new division dedicated to providing industrial HVAC services exclusively for steel mills and metal related industrial facilities.

Systems Cool Air Solutions will offer comprehensive HVAC capabilities including new installations, preventive maintenance

programs, and 24/7 emergency response – all designed specifically for the extreme demands of steel mill environments. Service offerings include control room and motor control center climate systems, overhead crane cab HVAC and pressurization, ventilation and exhaust systems, building automation and controls, and industrial refrigeration systems. Cool Air

Solutions joins TSG's existing divisions – Spray-Cooled, Plant Services, Clean Air (Industrial Air Filtration), Refractory Solutions, Contracting, Fab & Machine, and Engineering – to provide the most comprehensive suite of steel mill services under one roof.

| The Systems Group

U. S. Steel plans major investment at Fairfield tubular operations

U. S. Steel is investing in the installation of a state-of-the-art quench & tempering line at their Fairfield tubular operations, as a key element of broader expansion plans designed to capitalize on demand growth.

U. S. Steel Tubular Products' overall facilities will undergo significant improvements, including enhanced employee areas and the addition of a training center utilizing virtual reality technology to deliver operational training. The new quench & tempering line for the Fairfield site will remove a critical production bottleneck

and expand capacity. Additionally, the integrated technology applied will improve traceability from casting through finishing. The new line is expected to reach full production by the second quarter of 2029.

| U. S. Steel

U. S. Steel completes blast furnace reline at Gary Works

U. S. Steel successfully returned to service blast furnace No. 14 at its Gary Works following completion of a reline project that also included restoration of critical systems designed to support safe, reliable operation and extend the furnace's productive life.

Capable of producing more than 3 million t/year of hot metal, blast furnace No. 14 is the largest blast furnace at Gary Works and the largest in U. S. Steel's operating footprint. The return of the blast furnace to service marks an important milestone for Gary Works and also reflects U. S. Steel's continued commitment to invest-

ing in the long-term competitiveness of operations at Gary Work. During the outage, teams also completed extensive maintenance on supporting infrastructure, including the furnace gas, cooling water, hoisting and stove systems.

| U. S. Steel

U. S. Steel plans major capital investment in Mon Valley

U. S. Steel has released an economic impact analysis about its planned capital investment in Mon Valley Works. The investment would include the construction of a new, state-of-the-art hot strip mill at the Mon Valley Works Edgar Thomson Plant in Braddock, Pennsylvania.

The new facility would replace an 87-year-old hot strip mill at the nearby Irvin Plant, which is slated for decommissioning as part of the modernization effort. The new hot strip mill is designed to deliver improved yield, reduced energy consumption, and enhanced product quality, while expanding the range of steel products Mon Valley Works can produce for automotive and other high-value markets.

The study reflects the significantly expanded investment scope planned by U. S. Steel's owner, Nippon Steel, to more than double the original commitment. Updated projections indicate the total investment may range from approximately USD 2 billion to USD 2.5 billion.

| U. S. Steel

ASIA – CHINA

Henan Jiyuan awards EAF and caster orders

As part of its transition from traditional BF/BOF steelmaking to low-carbon steel production, Henan Jiyuan Iron & Steel has signed two contracts with Danieli for the supply of an electric arc furnace and a continuous casting machine for round blooms, respectively.

Danieli will supply a 55-t ECS Zerobuck-et™ electric arc furnace, including technologies such as horizontal continuous scrap-charging to minimize energy losses and off-gas leakage, a scrap-preheating tunnel using high-temperature off-gases to maximize energy recovery and reduce power consumption. The furnace will also feature advanced automatic process control systems to optimize power input and melting parameters, ensuring stable and efficient operation.

The new bow-type continuous casting machine to be supplied by Danieli will be designed for the production of round



Representatives of Henan Jiyuan and Danieli after signing the order for the new bloom caster (Photo: Danieli)

blooms from 600 mm to 1,300 mm in diameter. Danieli's scope of supply will include the core equipment of the new continuous casting machine, along with the related electrical and automation sys-

tems. The machine will feature an 18.5 m radius and four strands. Start-up of the new caster is scheduled for 2027.

■ Danieli

Sanbao Group orders strip processing lines

Fujian Kunbao New Materials, part of Sanbao Group, has signed a contract with Fives to design and supply two high-performance strip processing lines for electrical steel production in Zhangzhou.

The project includes the delivery of two decarburizing and coating lines for the production of grain-oriented electrical steel. Each line will have an annual production capacity of 100,000 t and will incorporate advanced strip processing technologies to deliver the highest magnetic performance steels. The lines will feature Fives' latest combustion and heat recovery systems, providing overall furnace efficiency of 70% while achieving ultra-low NO_x emissions to support the steelmaker's efforts to



Contract signing for the supply of two strip processing lines to Sanbao Group (Photo: Fives)

maximize energy efficiency and meet stringent environmental regulations.

■ Fives

Wuhan Iron and Steel to convert casting and rolling line

Wuhan Iron and Steel has awarded Primetals Technology the order for the restructuring of its casting and rolling

line. The line will be converted into a state-of-the-art, 4.2 million t/year conventional hot strip mill.

Wuhan Iron and Steel has decided to convert its CSP casting and rolling line into a conventional hot strip mill, making use of

selected existing equipment. Primetals Technologies has been selected as the principal technological partner responsible for engineering the main new equipment for the mill line and supplying key technological components. The new hot strip mill will feature a brand-new, high-capacity single-stand reversing roughing mill and

two sets of heavy edgers, providing the heavy edging reduction needed to match the new product mix requirements. New crop shear and descaling units will be installed between the roughing and finishing mill. The finishing mill, laminar cooling section, and downcoiler will be upgraded to support the expanded product range

and high-end product quality requirements. On the automation side, Primetals Technologies will supply the complete Level 1 and Level 2 architecture for the full line.

■ *Primetals Technologies*

ASIA – CHINA

Sanming MinGuang grants FAC for billet-grinding machine

Fujian Sanming Steel & Guangming has granted the final acceptance for a new high-efficiency billet-grinding machine supplied by Danieli. The supply scope included the mechanical equipment, and the electrical and automation systems.

The supplied unit is a latest-generation Danieli Centro Maskin grinding machine integrating the HiGrind® system, designed for the processing of both billets and blooms with full-skin and corner grinding capabilities. The grinding line processes square billets and rectangular blooms across a wide dimensional range. Main performance figures include a constant grinding-wheel linear speed of 80 m/s, grinding trolley speed up to 1.2 m/s under load, and positioning accuracy of ± 1 mm. Full-skin grinding depth is automatically controlled. The heavy-duty mechanical design and high-precision components provide a grind-



Billet grinding machine in operation (Photo: Danieli)

ing spindle service life of at least 8,000 h. The Danieli automation system adopts an open, multi-level architecture to support flexible production management.

Equipment installation was completed in December 2025, followed by successful

hot commissioning in a single trial and fulfillment of all agreed technical parameters.

■ *Danieli*

Shougang Shunyi to upgrade pickling line and tandem cold mill

Primetals Technologies has received an order from Shougang Cold Rolling to modernize the Level 1 and Level 2 automation systems at the pickling line tandem cold mill (PLTCM) in Shunyi, Beijing.

With the modern automation technology to be implemented, Shougang Shunyi will extend the life of its PLTCM control systems, simplify maintenance, and lower operating costs. Once implemented, the upgraded Level 2 platform will introduce advanced process models and improved data management, allowing for greater control accuracy, more stable processes, and more consistent product quality. As part of the project, Primetals Technologies

will also revamp one of the main PLTCM drives.

■ *Primetals Technologies*

The automation systems of Shougang Group's pickling line tandem cold mill in Shunyi, Beijing, will be thoroughly upgraded (Photo: Primetals Technologies)



ASIA – INDIA

JSW Steel places annealing furnace orders

JSW Steel is expanding into electrical steel production. As part of this strategy, JSW has placed orders with Fives for the

supply of annealing furnaces for three new processing lines.

At its Vijayanagar works in Toranagallu, JSW Steel is going to construct three processing lines dedicated to the production of non-grain-oriented electrical steel grades, used for electric vehicles and electrical motors in general. Fives will design and supply the annealing furnaces for each of the three lines, namely one annealing and pickling line with a capacity of 600,000 t/year and two annealing and coating lines, each with a capacity of 270,000 t/year. The contract was signed in consortium with John Cockerill.

| Fives



Contract signing for the annealing furnaces to be used in JSW's electrical steel production (Photo: Fives)

JSW Steel orders galvanizing line for automotive steels

JSW Steel has selected Andritz for the supply of a continuous galvanizing line for its steel plant in Toranagallu, Karnataka. The line will enable JSW Steel to expand its portfolio of value-added steel products.

Andritz's scope comprises the engineering, manufacture and supply of the com-

plete line, including terminal equipment, chemical cleaning section, furnace, coating pot and after-pot cooling as well as a skin pass mill, tension levelling line, and a post treatment section. Designed to meet stringent automotive quality standards, the 500,000 t/year line will provide superior surface quality, precise coating control, and consistent metallurgical properties.

The new line will process steel strip up to 1,900 mm wide and 2.60 mm thick, including advanced high-strength steel (AHSS) grades with tensile strengths of up to 1,480 MPa. It will be designed for process speeds of up to 180 m/min. Its start-up is scheduled for 2028.

| Andritz

JSW Steel to build pelletizing plants in Odisha

JSW Steel has placed an order with Primetals Technologies for two 8 million t/year pelletizing plants to be installed at the Paradeep facility in Odisha.

Primetals Technologies will be responsible for the complete plant design, engineering services, key process equipment, complete process automation, and advisory services for construction and implementa-

tion. The plant concept is based on an 816 m² induration furnace, which will serve as the basis for a standardized pellet plant model for future capacity expansions at Paradeep and other JSW Steel production sites. Smart sensors and advanced predictive control models form the core of the Primetals Technologies' digitalization solution for the new pelletizing plants, enabling continuous monitoring of process condi-

tions and transparent evaluation of the production process. The Level 2 automation system features a digital pelletizing optimizer, which enables automated adjustments to the green balling process to achieve a uniform pellet size distribution and consistently high pellet quality.

| Primetals Technologies

ASIA – INDIA

Ramsarup places order for SBQ mill

Ramsarup Industries has selected Danieli to supply a new special bar quality combination mill to be installed at the Kharagpur Works in West Bengal.

The new mill, integrating the latest Danieli Morgårdshammar SBQ technology, will

have a production capacity of 600,000 t/year of finished long products. In the special steel grade segment, it will produce 5,5 to 25 mm-dia. smooth and deformed rounds in coils as well as bar-in-coil from 16 to 45 mm. Additionally, the mill will roll commercial grade bars in straight lengths

in diameters ranging from 8 to 40 mm. Plant start-up is scheduled for early 2027.

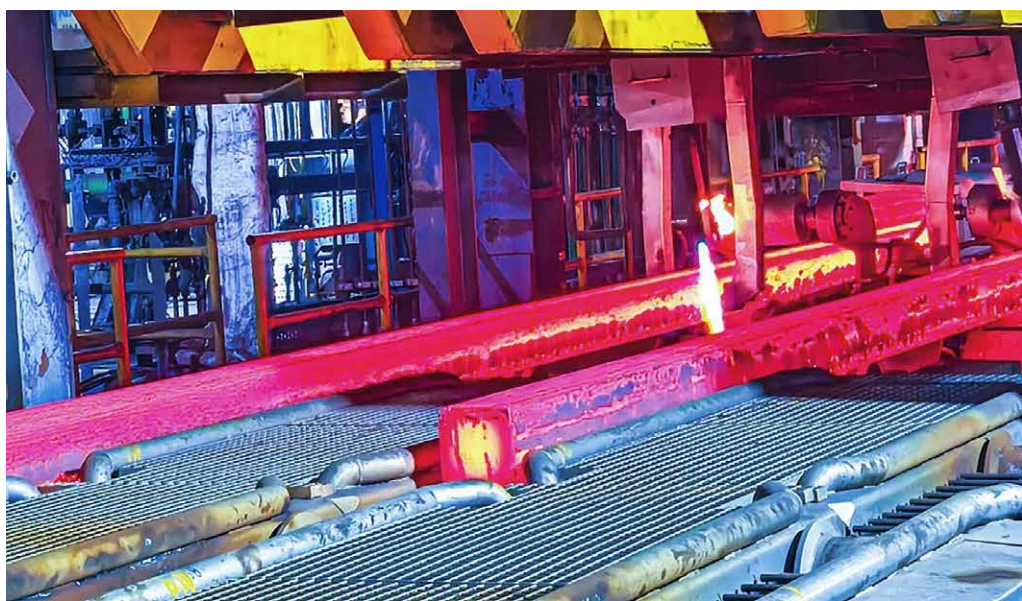
| Danieli

JSW Salem grants FAC for caster revamp

JSW Salem has recently granted the final acceptance for the modernization of a three-strand billet caster performed by Danieli.

Danieli's scope of supply included new moulds, oscillators equipped with Hy Power actuators, Danieli Rotelec mould and final stirrers, new withdrawal and straightening units, roller tables, and a discharge system incorporating a lateral transfer car, walking-beam cooling bed, and collecting tables. The upgraded machine is designed to cast 160 mm and 200 mm square blooms. Following the modernization, the caster successfully resumed production and reached the target output within one week of startup.

| Danieli



Modernized billet caster in operation at JSW Salem (Photo: Danieli)

ASIA – INDONESIA

Garuda Yamato Steel to modernize water-treatment plant

PT Garuda Yamato Steel has placed an order with Danieli to modernize the water-treatment plant of its steel production facilities. The new system will operate as the main cooling infrastructure for the plant.

The new water-treatment plant will be installed in a brownfield environment, where space constraints and operational limitations require optimized solutions. The design will allow integration within the

footprint of the existing plant while minimizing modifications to the current infrastructure. By avoiding demolition and major civil works, the project will reduce both investment costs and implementation time.

The solution also maximizes the reuse of existing infrastructure, including structural supports for piping, electrical and cable-routing systems, and overhead cranes that will be used for future operation and maintenance activities. Danieli's

supply includes engineering, project management, mechanical equipment, automation systems, and customized design solutions compliant with international standards. Danieli will also provide technical support throughout the project lifecycle, from engineering and execution through to commissioning and final acceptance of the system.

| Danieli

ASIA – SOUTH KOREA

Hyundai Steel enhances Gen3 steel production

A combined continuous annealing and galvanizing line was successfully modernized at the cold strip mill No. 2, Dangjin works of Hyundai Steel, South Korea. The company aimed to increase its production of ultra-high-strength steel.

Executed by international engineering group Fives, the modernisation project focused on three main areas: replacing the cooling section, integrating induction technology, and optimizing thermal control. After one year, performance gains are clearly measurable: 100% automatic

speed control usage, 95% strip temperature accuracy representing an improvement by +2% in heating and +1% in cooling control performance compared to the previously installed solution.

| Fives

KG Steel to modernize pickling line tandem cold mill

KG Steel has signed a contract with Primetals Technologies for the modernization of the pickling line tandem cold mill (PLTCM) at its Dangjin site. The project includes a full upgrade of both basic and process automation systems.

The current basic automation system will be replaced by the advanced Simatic S7-1500 platform. The new process automation system will leverage state-of-the-art AI technologies supporting the physical models to improve target values for strip thickness and flatness. This will allow KG Steel to produce a wider range of cold-rolled products, including galvanized and tin plate, as well as pre-coated metal products. Operators will also benefit from a renewed human-machine interface that provides better guidance and situational awareness. Additionally, all servers will be virtualized, increasing resilience, speeding up recovery, and simplifying lifecycle management. Virtualization and process opti-



KG Steel and Primetals Technologies' project execution team during the basic design meeting (Photo: Primetals Technologies)

mization, including an advanced pickling model, will help ensure stable, consistent product quality and efficient operations.

Primetals Technologies will connect the new system to the mill environment while

the existing system is still in operation, using a shadow mode and switch-over setup.

| Primetals Technologies

OCEANIA – NEW ZEALAND

New Zealand Steel starts EAF steel production

New Zealand Steel has started commercial steel production using the new electric arc furnace at its Glenbrook steelworks, just over two years after breaking ground.

Following a major transition of operations at the Glenbrook steelworks, New Zealand Steel, a wholly owned subsidiary of BlueScope Steel, has achieved its first commer-

cial steel production from the new electric arc furnace in a move that cuts the steelworks' annual greenhouse gas emissions by over 45%. The transition has involved replacing Glenbrook's oxygen steelmaking furnace and two of the four coal fuelled kilns, halving coal use at the site.

Project partners included Contact Energy, providing a competitive and innovative supply agreement for the required reliable

firmed renewable energy, and long-term scrap steel supply agreements with Sims and GMS diverting hundreds of thousands of tonnes of scrap from export to domestic recycling at Glenbrook. New Zealand Steel's sister company Pacific Steel will be the first to bring the new lower carbon steel product to market.

| New Zealand Steel

RAW MATERIALS

Tests for DR-grade pellet quality from Minnesota, USA

MagIron released the results from its pellet test program, demonstrating the capability to produce high-quality Direct Reduction ("DR") grade pellets from MagIron's Minnesota resources

MagIron LLC performed a first full pot-grate pellet test program in collaboration with independent experts at the Natural Resources Research Institute ("NRRI") of the University of Minnesota. The pellets were produced from iron concentrate generated at NRRI during MagIron's 2025 pilot plant program and representative of the high-grade concentrate the company is targeting from commercial operations with the proven capability to produce lower silica product depending on customer requirements. Since completing the pilot program, MagIron and NRRI have continued collaboration to optimize the MagIron process flow-sheet, including evaluating a coarser grind, alternative flotation technologies and reduced reagent consumption. These initiatives are expected to further enhance the project economics relative to those reflected in the Behre Dolbear feasibility study while maintaining the high quality of the concentrate.

MagIron's fired pellets have demonstrated excellent strength and durability, supporting their suitability for high-performance DR furnace operation. Independent standardized testing done by NRRI, averaged over the first five batches producing over 500 lbs (227 kg) of finished pellets, showed:



MagIron's fired pellets have demonstrated excellent strength and durability, supporting their suitability for high-performance DR furnace operation

- › High cold compressive strength of 730 lbf (3,250 N) per pellet, supporting pellet integrity during handling, transport, and furnace charging.
- › Strong product handling characteristics of 96.8% Tumble Index, indicating low fines generation and

improved material flow through DR reactors.

- › Porosity of 32.1%, supporting efficient gas diffusion and uniform reduction behaviour.
- Metallurgical testing also demonstrated excellent performance under direct reduc-

About MagIron

MagIron is focused on the restart of an iron ore concentrator located near Grand Rapids, Minnesota and a pelletizing plant located near Reynolds, Indiana. The facilities have previously operated at an annualized run-rate of approximately 2.2 million tonnes per year of BF grade concentrate and were designed to expand to 3.0 million tonnes per year relatively quickly and at low capital intensity.

The iron ore concentrator was originally designed to process previously discarded waste materials from historical mining operations and convert such feed materials into high grade, low impurity iron ore concentrate. Given the significant historical mining operations across the Mesabi Iron Range in northern Minnesota, there are vast amounts of surface material and in-situ virgin oxidized iron formation in close proximity to MagIron's concentrator which are suitable as feedstock to support a multi-decade business plan.

tion conditions, a critical requirement for DRI producers, including:

- Near-zero disintegration during reduction, with Linder (ISO 11257) results showing a Reduction Disintegration Index (RDI-3.15) of 0.13%, enabling smoother furnace operation and lower dust carryover.
- High degree of reduction, with an R90 (ISO 11258) result of 97% demonstrating efficient oxygen removal under DR conditions.
- High metallization of over 97%, demonstrating a high level of conversion to metallic iron.

These repeatable results position MagIron's pellets as a premium, high-stability feedstock for modern DRI plants. The combination of high porosity and exceptional pellet strength is particularly well suited to shaft-furnace operation. Higher porosity facilitates penetration of reducing gas and supports efficient reduction, while high pellet strength helps maintain bed permeability and limits fines generation during handling and reduction. Together, these characteristics have the potential to support higher shaft-furnace productivity and throughput, lower reducing-gas consumption, lower maintenance requirements and more consistent metallization,

supporting more efficient low-carbon steelmaking. These results will be further validated through bulk pellet samples provided to potential customers for testing in their facilities.

MagIron continues to engage with potential commercial and strategic partners and is advancing its technical, commercial and financing workstreams toward a final investment decision focused on the development pathway that the Company believes will create the greatest value for shareholders.

■ *MagIron, LLC.*

Ferrous slag preserves natural rock and reduces CO₂ emissions

EUROSLAG, the European association of ferrous slag producers and processors, has released figures for 2025 on ferrous slag production and use.

In 2025, approximately 17.8 million t of blast furnace slag and 16.8 million t of steel slag were produced in the European Union. Additional extraction of temporarily stored blast furnace slag made a total of around 36,1 million t of ferrous slag available. Of this, 88 percent was used as building materials and fertilizers, as well as in other applications. This prevented the extraction of 38 million t of natural rock and the emission of 11 million t of CO₂ across Europe. Between 2000 and 2025, this will amount to a total of 1.25 billion t of natural rock and 330 million t of CO₂.

In 2025, 19.3 million t of blast furnace slag were used in their entirety: 17.5 million t granulated blast furnace slag was used in cement and 1.8 million t as aggregate in concrete and road construction. Of the 16.8 million t of steel slag, 8.6 million t were used in road construction, 1.3 million t in building construction, 0.9 million t in fertilizers, and 1.8 million t for metallurgical work. That is a total of 12.6 million t, or 75 percent.

Thomas Reiche, Chairman of the Board of EUROSLAG and Managing Director of FEhS Building Materials Institute: "Last year, ferrous slag once again made an enormous contribution to resource con-



Granulated slag is a recycled material that is commonly used in cement production
(Picture: FEhS-Institut/Michael Wieschke)

servation, climate protection, and the circular economy in Europe. And this was achieved despite major political and economic challenges. EUROSLAG will continue to advocate for the by-products of the steel industry to be utilized as valuable secondary raw materials, even in a transformed industry. To achieve this, we need adequately funded, practice-oriented

research as well as optimized national and European regulations. Examples include the EU's Public Procurement Act and Circular Economy Act."

■ *EUROSLAG*

LONG STEEL PRODUCTS

Pacific Steel Group to set new benchmarks in green steelmaking

Pacific Steel Group has started a greenfield project to build a new steel complex for long products. Using hybrid mill technology and a renewable energy portfolio in a unique micro mill configuration will make the Mojave facility one of the cleanest of its kind.

Pacific Steel Group is building California's first new steel mill in more than 50 years. Located in Mojave, just outside of Los Angeles (CA), the new MIDA QLP Hybrid Minimill, supplied by Danieli,

will produce approx. 350,000 t (380,000 short tons) per year of reinforcing steel from scrap, relying on the latest digital technologies and renewable energy integration.

"With a declared USD 630 million net investment, the plant will demonstrate why MIDA Hybrid is the natural (re)volution to a tried and tested, much-appreciated technology", Eric Benson, Pacific Steel's chairman of the board and CEO, said.

The competitiveness of the production will be ensured by digital steelmaking tools like the Q-One power feeder, high-productivity casting with the patented octagonal mould, stable endless-casting-rolling process for yield close to 100% (104% considering run light).

A fully automated scrap-yard will ensure ideal scrap management – scrap selection and handling – for best EAF efficiency, while Danieli original D-NO_x, D-SO_x and PM technologies will allow nitrogen and sulphur oxides and particulate matter abatements up to 90%.

With commissioning scheduled for the first quarter of 2027, the MIDA QLP Hybrid Minimill of Pacific Steel Group will become a benchmark for low-emission, energy-efficient steelmaking.

Project highlights

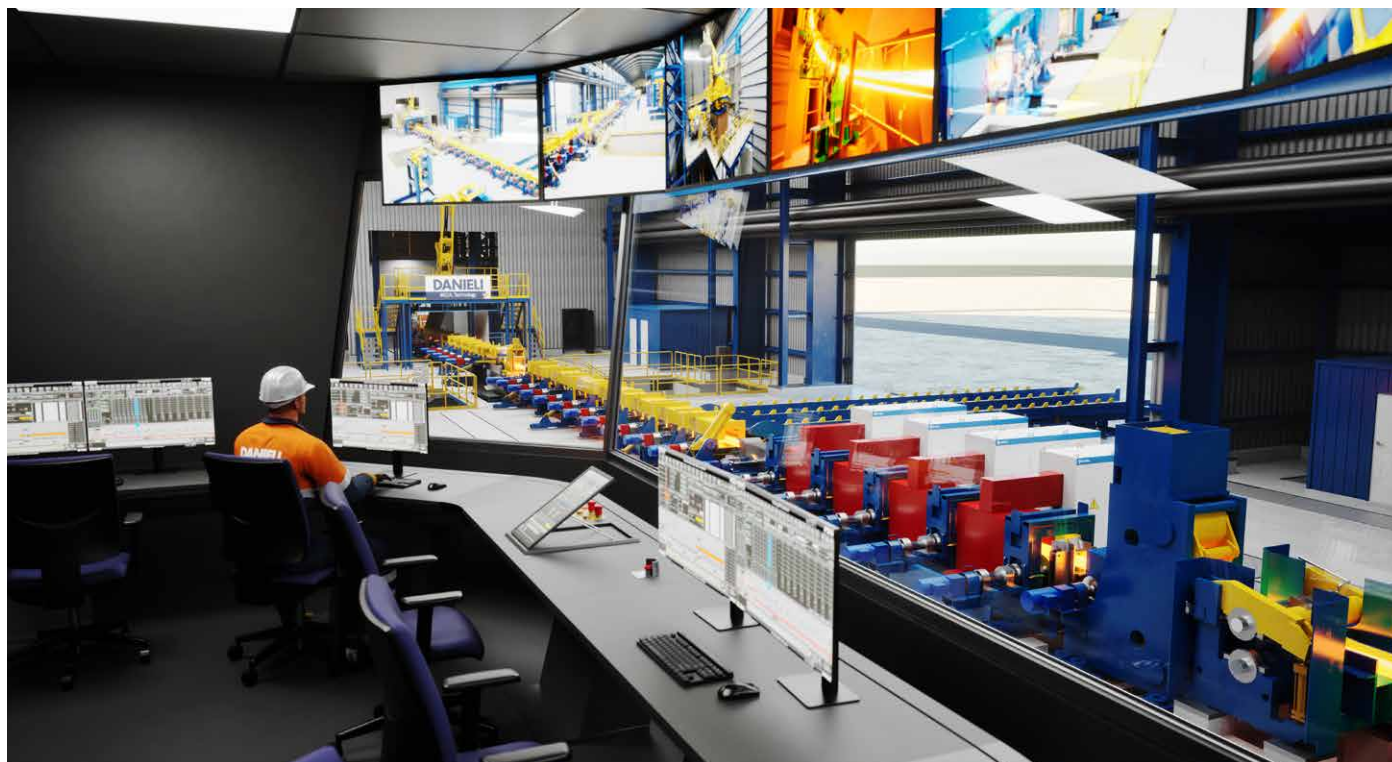
At the heart of the new plant is the Danieli endless casting and rolling technology,



Rendering of the future Morave site of Pacific Steel Group, once completed
(Picture: Danieli)



Process scheme of the MIDA QLP minimill
(Picture: Danieli)



At the heart of the new plant is the Danieli endless casting and rolling technology, which allows liquid steel to be transformed into finished rebar in approximately 10 minutes (Computer image: Danieli)

which allows liquid steel to be transformed into finished rebar in approximately 10 minutes, without intermediate cooling or reheating. By eliminating the traditional billet yard and gas-fired reheating furnaces, the process significantly reduces overall energy consumption and emissions, and operating costs.

Energy efficiency is further enhanced by the use of Q-One® digital power feeders to supply the electric melting and refining units – Digimelter and Digirefiner. Q-One® installations can deliver energy savings up to 8%, reduce power-on time by around 10%, and cut electrode consumption by more than 15%, contributing to lower OpEx and improved process stability.

Ultra-low environmental impact. Environmental performance is a defining feature of the Pacific Steel project. The plant will be equipped with an original ECO Primary Line, developed to drastically reduce emissions from electric arc furnace operations. The system targets key pollutants such as NO_x, SO_x, particulate matter, and volatile organic compounds, bringing emissions down to industry-leading levels.

The design also includes provisions for the future installation of carbon capture systems, underscoring Pacific Steel Group's

long-term commitment to low-carbon steelmaking. Industry observers describe the project as one of the most environmentally advanced reinforcing-steel facilities currently under development.

Stable quality. The endless production route offers not only energy efficiency but also high and consistent product quality. Continuous synchronization between casting and rolling minimizes temperature fluctuations, resulting in stable metallurgical properties along the entire length of the finished product. This is particularly relevant for the production of seismic-grade rebar, where uniform mechanical performance is critical.

Advanced automation systems continuously monitor process parameters, ensuring repeatability, reducing the risk of out-of-spec production, and limiting operator intervention.

Automated logistics. Automation extends beyond the production line. The Mojave plant will feature fully automated scrap-yard management systems and automatic overhead cranes serving the scrap yard, melting shop, and rolling mill. These systems enable real-time material tracking from scrap receipt to fin-

ished-product storage, improving logistics efficiency and workplace safety.

By reducing manual handling in high-temperature and high-risk areas, automation also contributes to more predictable operations and lower indirect operating costs.

Renewable energy integration. One of the most innovative aspects of the project is the integration of on-site renewable energy, supported by Q-One technology. The digital power feeder allows the steel-making process to be supplied directly from photovoltaic installations, routing and stabilizing power even under variable generation conditions.

This capability is particularly relevant in California, where renewable energy availability is high and grid stability is a growing concern. The plant is designed to minimize its impact on the external power network while maximizing the use of green electricity.

Data-driven operations. The MIDA QLP hybrid minimill at Pacific Steel Group is supported by a digital ecosystem developed by Danieli Digital to transform plant data into actionable operational and strategic insights for production excellence, sustainability, and operational efficiency.



Pacific Steel Group is building California's first new steel mill in more than 50 years, with commissioning scheduled for 2027
(Picture: Danieli)

Digitalization spans the entire steelmaking value chain, combining industrial data, simulation models, artificial intelligence, and immersive technologies. The objective is to enhance operational transparency, support data-driven decision-making, and accelerate continuous improvement from commissioning onward.

Key digital pillars include Digital Twin technologies, process and production simulators, AI-based assistants, immersive training environments, and ESG performance simulation tools, enabling sustainable operation.

Outlook

"We are excited about partnering with Danieli to build one of the cleanest, safest and most efficient steel mills in the world ... we want to bring back steel manufacturing in California", commented Mark Olson, Pacific Steel Group, vice president of mill operation. "Danieli is continuously innovating, which was a major factor in our decision to partner with them on this steel mill project. Together, we are building a facility designed to produce some of the greenest steel in the world, with compet-

Mojave micro mill progress and milestones

The second quarter of 2026 concluded with strong progress across rebar and concrete installation activities. More than 80% of the foundation work has been completed, enabling three critical-path areas – the cooling bed, fume treatment plant, and process water treatment plant – to advance equipment installation by the mechanical and piping contractor. The steel mill is beginning to take shape, with the overall facility layout and process flow becoming increasingly visible. Structural erection of the scrap bay has been completed. The finishing and fabrication shops remain the most advanced areas of the project. Granite Construction has continued to make progress on underground utility installation. What's coming next?

- › Construction of the melt shop complex
- › Structural erection of rolling mill and installation of the rolling stands
- › Underground utilities will continue

As construction of the Mojave micro mill continues, Pacific Steel Group remains committed to building lasting partnerships throughout East Kern County.

■ *Pacific Steel Group*

itiveness and sustainability serving as core priorities", Mark Olson added.

■ *Danieli*

THE DANIELI DIGIMELTER CONCEPT

Minimill technologies for green steel

The technological concept of the MIDA QLP Hybrid Minimill is relying on the latest digital technologies and renewable energy integration. The competitiveness of the production is ensured by digital steelmaking tools like the Q-One power feeder, high-productivity casting with the patented octagonal mould, stable endless-casting-rolling process for maximum yield. A fully automated scrap-yard provides ideal scrap management – scrap selection and handling – for best EAF efficiency. Danieli original D-NO_x, D-SO_x and PM technologies allow nitrogen and sulphur oxides and particulate matter abatements up to 90%.



The patented Q-One power feeder is the key technology at the basis of the Digimelter® concept (Picture: Danieli)

The Danieli Digimelter® concept is an advanced digital EAF platform. Digimelter® is the Danieli answer for modern, clean, competitive, sustainable green steelmaking, with the approach to set a new benchmark technology for electric steelmaking to melt scrap/DRI.

The Danieli-patented technology provides a unique combination of power, intelligence, and environmentally friendly equipment for achieving 15,000 heats per year with minimal OpEx, lowest environmental impacts, and high flexibility for raw materials.

The Q-One electrical feeder provides the highest power factor and very low network flicker due to real-time arc control. It achieves unprecedented high-power transfer thanks to independent control of arc current, voltage, and frequency, for each electrode.

The Q-Melt intelligent controller runs EAF melting processes automatically, in a stable and adaptive way by making use of Q-Reg+ electrode regulator, Lindarc laser off-gas analyzer, and Melt-Model self-learning optimizer.

The Zero-bucket concept is accomplished by the ECS continuous scrap charging and preheating system, as well as continuous hot DRI feeding through the roof, for reduced environmental impact and enhanced energy saving.

The Eco-Pro airtight design is conceived to reduce pollutants to the minimum. Compared to a conventional EAF with the same charge mix, Digimelter® Eco-Pro reduces the CO₂ direct emissions (Scope 1) by more than 50% and overall CO₂ emissions (scope 2) by 25%.

Q-One power feeder

Q-One is the key technology at the basis of the Digimelter® concept. It makes use of power electronics to control electric arc current and voltage in the EAF. In other words, using the conventional furnace design, this solution can impose arc current with consequent benefits in process stability, and reducing drastically the impact on the connecting electrical network.

Q-One also enables the operation of electric arc furnaces when connected to weak power grids. The system is modular by design, improving reliability and plant availability. The power required by the process can be adjusted by selecting the number of modules, and the solution can

be designed for progressive growth in stages – a scale-up design concept.

High availability is a must, and that's why modules have also been designed with the same components and inverters, which minimizes the quantity and value of spare parts. The digital control allows for remote monitoring and troubleshooting.

The working points are no longer discrete, dictated by the taps on a transformer, but can be chosen freely according to process needs, with the possibility also to change the frequency with benefits for process and energy consumption.

The control of arc current implies a much more stable operation of the furnace, resulting in a reduced electrode consumption, up to 15%, and at least 20% longer refractory life.

Octocaster® – the key feature

A single-strand, high-speed continuous casting machine is the core of the Danieli endless casting and rolling process. Equipped with patented FastCast Cube (FCC), Eco-Power Mould® copper tube with a proven octagonal section, and the Q-Cool solidification model part of the Danieli Automation process control package, Octocaster® produces quality endless billets at speeds up to 10 m/min, making it possible to reach productivities up to 1.5 million tpy with a single casting strand.

The sum of these patented technological innovations minimizes bulging phenomena that happen when the solidified shell is so thin that it bends outward due



Eco-Power Mould® copper tube with a proven octagonal section (Picture: Danieli)

to ferrostatic pressure, making it possible to produce at high speeds and high production rates.

Octagonal section shape offers constant contact between copper tube and the product, and the eight corners of the mould minimize product deformation because the ferrostatic pressure is better distributed.

The FastCast Cube –FCC is the patented mould oscillator that allows excellent casting performances, having low inertia due to the “bearing-free” technology, very compact design and very limited weight for the oscillating part.

The cartridge-design of the mould featuring foot rolls and automatic water connections allows a quick and easy installation. Danieli FCC achieves an oscillation range 50% wider than a conventional oscillator design and an acceleration up to 6 m/s². FCC operates with high precision and reliability, decreasing maintenance activities and costs compared to conventional oscillators.

Thanks to a new channel design and increased copper tube rigidity for higher contact stability with the product, Eco-Pow-



The Q-Cool solidification model monitors and dynamically controls the cooling parameters and product solidification (Picture: Danieli)

er Mould® ensures optimal thermal exchange and temperature distribution.

The Q-Cool solidification model monitors and dynamically controls the cooling parameters and product solidification, allowing process stability under any operating condition, which results in smooth production sequences and higher product quality.

Based on meshless (pointillization) method, the Danieli Automation model is proven to offer highly accurate and fast calculation of process parameters, over slabs, blooms and billets in different steel grades. Furthermore, an offline function allows metallurgists to test the new casting practices virtually, simulating the relevant effects on the billets.

Scrap optimization and management

Q-Melt EAF production suite interfaces with the Danieli Automation Q-SYM2 automatic scrap management system. Q-SYM2 is an advanced system making use of upstream AI-based scrap optimization requiring no on-field operators. It provides the furnace with the best interaction between raw material and scrap-processing machines, according to EAF/scrap bay needs.

Scrap is mapped from its arrival at the bay of steelmaking plant to its use in the furnace, to ensure the incoming material quality and quantity according to the purchase order.

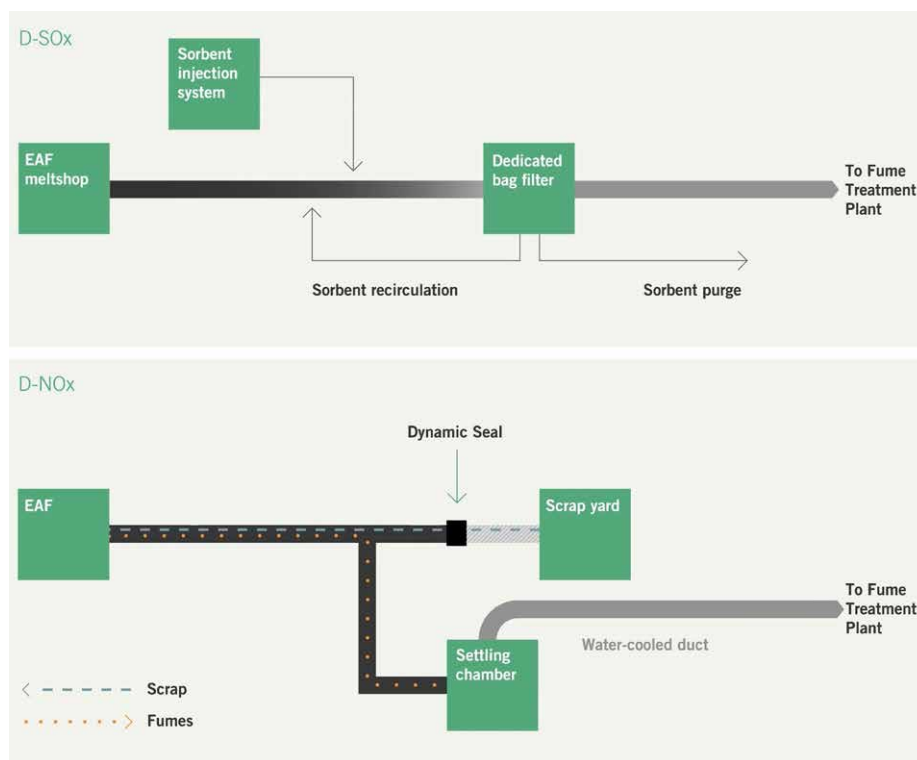
Real-time tracking allows for prompt, effective, and simplified claim procedures when needed thanks to artificial intelligence that makes possible automatic image acquisition and analysis.

Real-time scrap inventory is made continuously available, reducing human errors and operational time. Scrap tracking handles scrap movement within the yard, including loading and unloading bays.

A native integration within the overhead cranes improves yard management yield. Accurate “crane mission-generation” results in optimized crane utilization, with repetitive actions executed promptly according to scheduled, predetermined patterns.

NO_x, SO_x and PM abatement

Danieli original D-NO_x, D-SO_x and PM technologies installed in electric steel meltshops allow for nitrogen and sulphur



Danieli original D-NO_x, D-SO_x and PM technologies for electric steel meltshops

(Picture: Danieli)

oxides and particulate matter abatement up to 90%, reaching and overcoming the strictest present and future emission regulations.

D-NO_x abatement systems, available mainly for electric arc furnaces, make use of catalytic and non-catalytic technologies with the injection of appropriate reagents to cover a wide range of process conditions.

D-SO_x systems imply the use of dry and wet systems, including injection of hydrated lime in the fume-treatment plant ducts, which can be recirculated. They meet the requirements for SO_x pollutants abatement generated during meltshop operation.

Wet Electro-Static Precipitators (WESP) – which can work coupled with direct contact coolers (scrubbers) – are used to capture both filterable and condensable particulate matter. These systems are also able to abate SO_x, therefore ensuring the abatement of multiple pollutants in a limited space.

Such technologies and systems are applicable to new plants and existing ones by implementing low-impact upgrades. Emission parameters referring to the Pacific Steel Group project are designed as following:

- PM 10, PM 2.5 filterable and condensable: < 0.047 lb/sht (< 25 g/ton)
- NO_x: < 0.09 lb/sht (45 g/ton)
- SO_x: < 0.1 lb/sht (< 50 g/ton)
- VOC: < 0.07 lb/sht (< 45 g/ton)
- CO: < 1.8 lb/sht (< 0.9 kg/ton)

Digitalization at MIDA QLP minimills

At Danieli HQ a dedicated team is working for the development of digitalization of MIDA QLP minimills. Its portfolio covers the full lifecycle of the plant – from engineering and commissioning to daily operation, to ESG reporting and continuous improvement.

Before the first heat is tapped at a MIDA QLP minimill – like that at the PSG plant in the USA – digital pre-commissioning is possible through Danieli MIDAvverse. This high-fidelity simulation trainer and digital twin reproduces the dynamic behaviors of meltshop, caster and rolling mill. Technologists can validate control logic and tune set-points against rare operating conditions, while operators train in a fully realistic, risk-free environment, dramatically shortening the startup gap between initial and full productivity.



The Octocaster®, which is directly linked to the rolling mill, produces endless billets at speeds of up to 10 m/min
(Picture: Danieli)

Every production phase – from scrap unloading to finished product shipment – generates a continuous stream of data that converges into Danieli Space, the secure digital and comprehensive digital twin supporting analysis of production flows, energy consumption, and process interactions. Built specifically for MIDA QLP endless casting-rolling installations, Danieli Space combines 3D geometry, real-time process data and historical genealogy in a single navigable environment, made accessible from the control rooms or mobile devices through secure remote access.

Engineers and operators can "walk" inside the plant, inspect any piece of equipment and its live KPIs. Replay of past events for root-cause analysis and remote collaboration with Danieli experts is also possible, reducing decision time, and minimizing the need for onsite interventions.

Also, operators and shift managers interact with the plant through the Danieli AI Assistant, a generative-AI interface that answers natural-language questions on trends, KPIs and alarms, and suggests corrective actions grounded on real plant data.

Plants can operate also in SimuPlant, the immersive digital twin simulation tool that allows steel companies to evaluate production scenarios, optimize operating parameters, and anticipate process constraints. These capabilities reduce operational risks and allow more predictable

performances across steelmaking, casting, rolling, finishing and logistics.

Sustainability objectives are supported by an ESG simulation framework that models and monitors environmental performance indicators such as energy efficiency, CO₂ emissions, and resource utilization. By combining production data with simulation models, the ESG simulator supports informed decisions aligned with regulatory requirements, corporate sustainability goals, and long-term decarbonization strategies.

Data-driven operation is then translated into measurable benefits at the equipment level through the smart products. The intelligent rolling guides, for example, embed sensing and edge intelligence to monitor forces, temperatures and wear, self-adjust against thermal drift and anticipate the optimal replacement moment – delivering more stable rolling, fewer cobbles, longer guide life and consistent tolerances.

Through Danieli Space, every operational event feeds underlying models, so that the plant becomes measurably better the more it runs.

Robotics for increased safety and high repeatability

Flexibility plus intelligence guide Q-Robot applications in steelmaking operations, from meltshop and casting floors to finishing bays. Q-Robot systems are pro-

grammed technologies that allow safe operation and high repeatability, collecting operational data used in continuous process improvement, combining localized and remote intelligence.

Localized intelligence is gathered by integrated autonomous functions that allow Q-Robots to work independently with limited external input and computational resources. These functions include pre-emptive measures, self-diagnostic routines, self-calibration mechanisms, self-learning capabilities, and performance monitoring.

Remote intelligence involves comprehensive data analysis beyond immediate Q-Robot functions to provide long-term insights relevant to KPIs, predictive maintenance plans, and statistics. This analysis leverages data collected from both the robot and its external environment, allowing for continual optimization of production cycles and serving as a foundation for remote assistance.

Conclusion

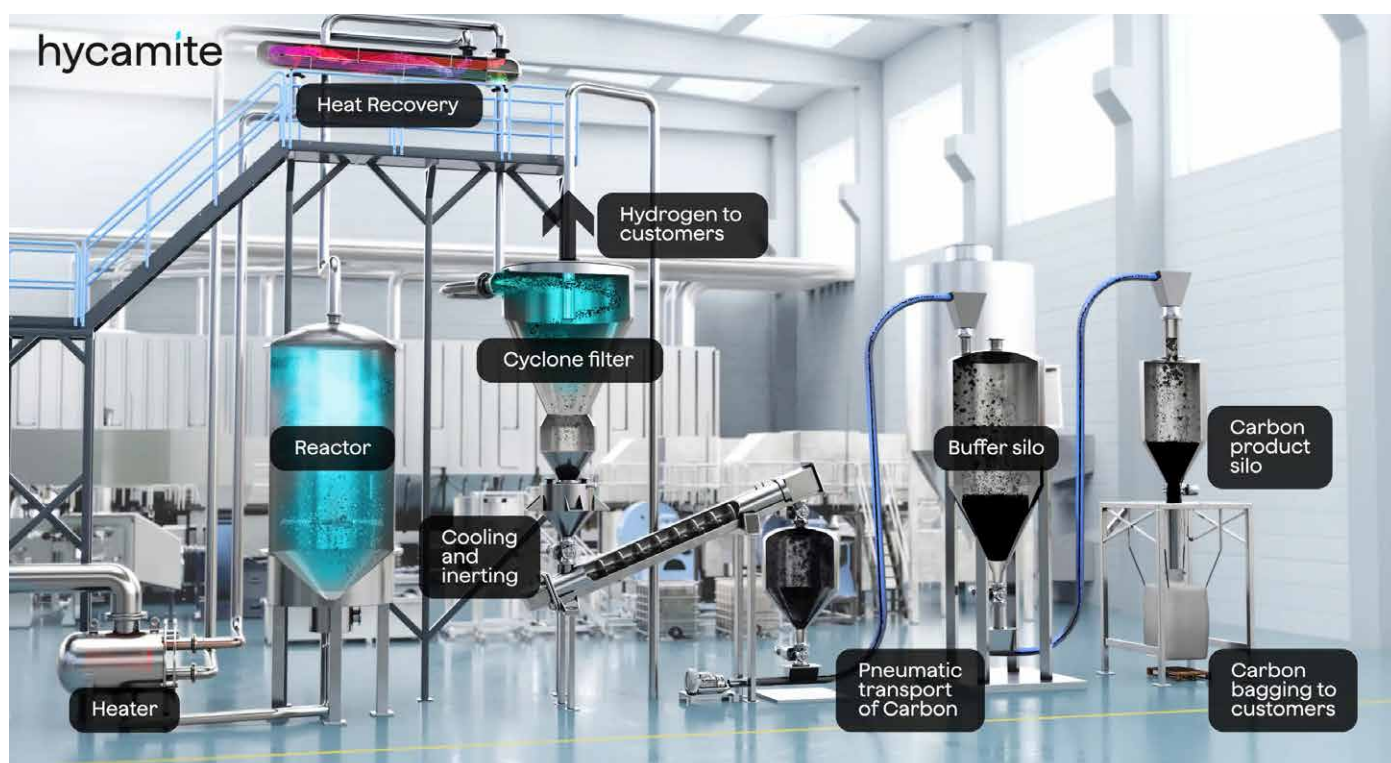
The MIDA QLP hybrid minimill concept is based on a compendium of technologies incorporating more than thirty Danieli patents – down the process route from scrap handling to rebar finishing.

| Danieli

RESEARCH AND DEVELOPMENT

Finland's FutMet initiative to renew the entire steel production chain

The follow-on Future Sustainable Electric Steel Mill (FutSteel) project, led by the University of Oulu and SSAB will develop the entire steel production chain, combining electricity-based electric arc furnace technology with modernised hot rolling processes.



Hycamite's methane pyrolysis technology produces low-carbon hydrogen and valuable carbon materials (Picture: Elomatic)

Recently, the University of Oulu, Finland has launched the new Future Sustainable Electric Steel Mill project – “FutSteel”, a €17 million research project in close collaboration with industrial partners. The research results will be directly linked to supporting the industrial transformation of steel production. The project will develop the entire steelmaking chain, combining electric arc technology with modernized hot rolling processes. The solutions will support the transformation of the Finnish steel industry and the transition to a low-carbon steelmaking concept at the SSAB Raahe steel mill.

The steel industry is undergoing a global transformation. Traditional coal-fired blast furnace-based production causes significant emissions, and tightening climate targets, changing energy systems, and the availability of raw materials are challenging current production methods. Therefore, production is being shifted towards a model based on electricity, recycled steel, and hydrogen-based processes.

The FutSteel project will determine how the production system can be renewed without compromising quality or delivery capacity. “This is essential to

maintaining high-quality steel production in Finland,” emphasizes Petri Sulasalmi, PhD, from the University of Oulu, who is leading the FutSteel project. “Electrification of the steel industry does not just mean replacing one furnace with another. The entire production chain, from ironmaking to rolling, must be thought of in a new way,” says Sulasalmi. Key points in the FutSteel project can be summarized as following:

Renew of the entire production chain.

The project will investigate how a new model combines electric steelmaking with

modernized rolling mill processes and utilizes fossil-free energy solutions

Quality and technology challenges.

Research focuses particularly on steel quality and how new electrical and low-carbon processes can be adapted to demanding special steel production

Major impacts on Finland. The steel industry is one of the largest single sources of emissions in Finland, and the transition to electric and hydrogen-based production can reduce emissions in the sector decisively: a change in a single large steel mill can cut up to 7 percent of the country's carbon dioxide emissions.

The FutSteel project develops a model in which electric arc furnace (EAF) technology is integrated into the existing hot rolling production chain and explores how electric steelmaking can be combined with modern rolling processes powered by fossil-free energy. The research also focuses on maintaining steel quality and adapting low-carbon production methods to the manufacture of advanced specialty steels.

The research partners in the FutSteel collaboration are the University of Oulu, VTT and Åbo Akademi, and the industrial partners include SSAB, Coolbrook, Ovako, Hycamite, Otanmäki Mine, Strategic Resources, Titanor, Carbo Culture, Convi-on and Nordkalk.

Strategic Resources Inc. to supply concentrate

FutSteel has selected Strategic Resources Inc.'s vanadium-rich magnetite ("VTM") concentrate from the Company's Mustavaara project in northern Finland for inclusion in an advanced hydrogen-based ironmaking testing program. This selection underscores the quality and suitability of Strategic Resources VTM material for next-generation direct reduction ("DRI") and fossil-free steel production, and is representative of Mustavaara's concentrate quality and relevance to the growing global green steel supply chain.

"Having Strategic Resources Inc.'s VTM concentrate selected by FutSteel for their fossil-free steelmaking research is validation of what we have always known: Finland hosts a well-developed, high-grade VTM asset (Mustavaara) with potential strategic importance to the future of

Electrification does not just mean replacing one furnace with another. The entire production chain, from ironmaking to rolling, must be thought of in a new way.

Petri Sulasalmi, PhD, FutMet Project Leader, University of Oulu, Finland

clean steel production. As the global steel industry transitions away from coking coal toward hydrogen-based processes, the demand for high-quality local iron ore feedstock will only intensify. Our Company is well-positioned to be part of that supply chain," said Sean Cleary, CEO, Strategic Resources Inc.

Technologies for low-carbon hydrogen and critical carbon materials

Finnish cleantech company Hycamite, a producer of emission-free hydrogen and high-quality carbon materials, is contributing to research efforts focused on integrating the production of hydrogen and high-quality carbon materials directly into steelmaking. Hycamite previously participated in the precursor research project, Towards Fossil-Free Steel Phase 2 (FFS2). The company has now joined the new Future Sustainable Electric Steel Mill (FutSteel) project.

"When hydrogen is produced from methane using an emission-free process, production costs can be significantly reduced, and hydrogen can be delivered quickly in the large volumes required by the steel industry," said Matti Malkamäki, Chief Executive Officer (CEO) of Hycamite.

"There continues to be a need for emission-free carbon products in the production of low-CO₂ emission steel," added Niina Grönqvist, Head of Carbon Products at Hycamite. "Carbon is still required for slag foaming in electric arc furnaces and for alloying."

Integrating steel production with methane utilization also offers additional advantages. "Hycamite's technology requires,

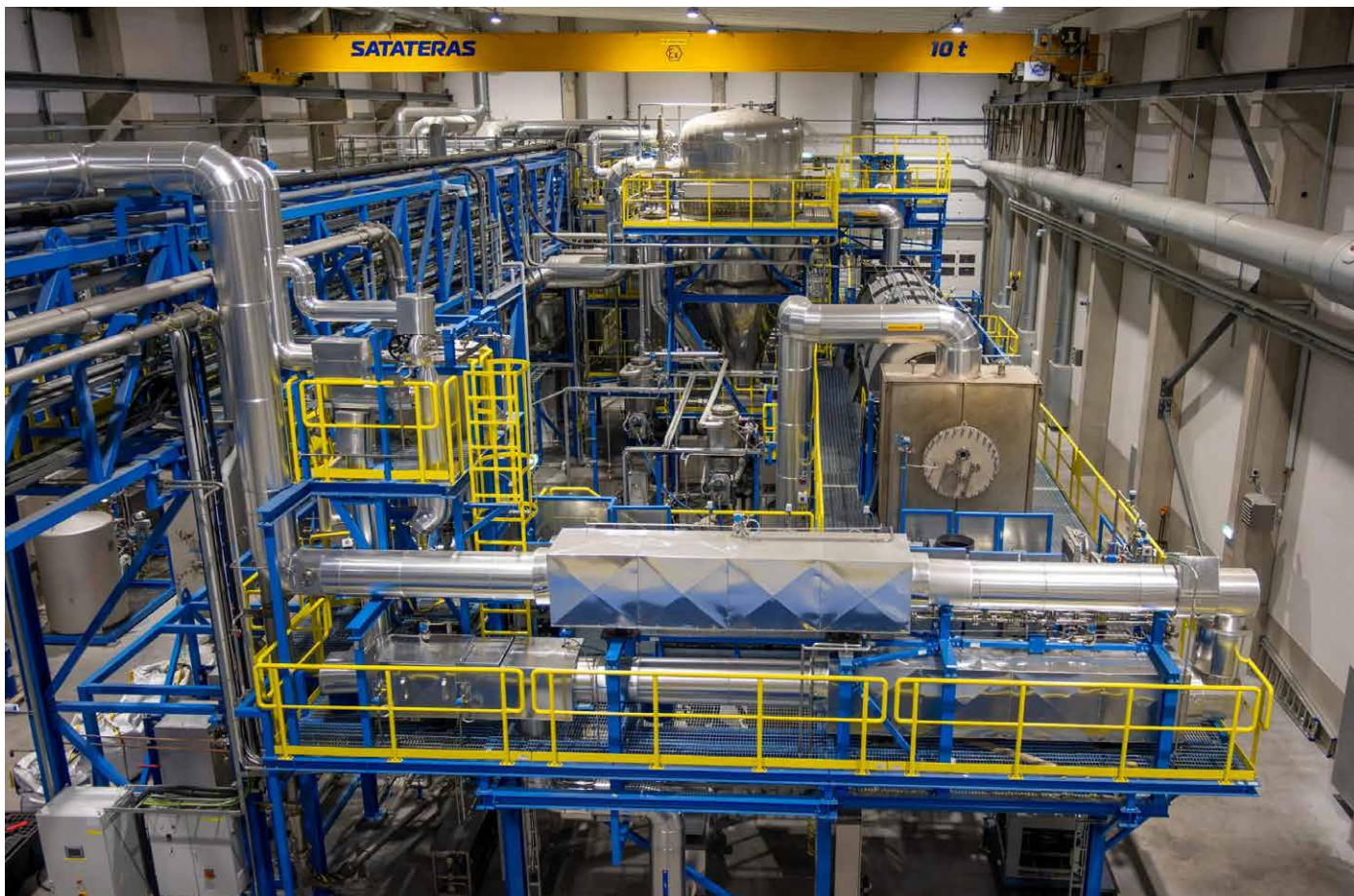
in principle, only about one-eighth of the energy used in electrolysis to produce hydrogen, and much of that energy can be sourced from excess heat generated by the steel plant," said Laura Rahikka, Chief Operating Officer (COO) at Hycamite.

Hycamite's proprietary methane (CH₄) splitting technology enables the production of low-carbon hydrogen (H₂) and high-value carbon materials without carbon dioxide (CO₂) emissions, supporting the decarbonization of industrial processes. The company developing methane pyrolysis technology continues to strengthen its position as a provider of low-carbon hydrogen and critical carbon materials for global industries.

Coolbrook to develop advanced electric heating technology

Coolbrook, a transformational technology company dedicated to decarbonising heavy industry and industrial processes, has been awarded research and development funding by Business Finland to accelerate the decarbonisation of steel production. The grant supports Coolbrook's participation in the FutSteel project. Within the broader FutSteel project, Coolbrook's project scope amounts to €5 million, of which €2.5 million is covered by grant funding awarded to Coolbrook.

The funding will enable Coolbrook to further accelerate and develop its next-generation RotoDynamic Heater™ (RDH™) technology, specifically tailored for high-temperature steel industry applications. The project focuses on integrating RDH™ technology into critical stages of the steel production chain, including blast furnace processes, electrified reheating, hot-stove air pre-heating, hybrid-heating



The Hycamite decomposition plant is an industrial-scale R&D and validation facility located in Kokkola, Finland (Picture: Ulla Nisonen)

concepts, decarbonised Direct Reduced Iron (DRI) production, and hydrogen-based steel production.

Following the successful commercial-scale deployment of its RDH™ technology in the cement industry, Coolbrook is now extending this proven engineering to address the hard-to-abate challenges of steel manufacturing. Traditional methods rely on burning fossil fuels to reach the extreme temperatures required for steel-making, Coolbrook's RDH™ uses renewable electricity to achieve temperatures up to 1700°C with zero operational CO₂ emissions.

Joonas Rauramo, CEO, Coolbrook, said: "This funding from Business Finland is a significant endorsement of our Roto-Dynamic technology and its role in clean energy transition. Having already demonstrated the commercial viability of our

electrification technology in the cement sector, we are now focused on delivering the same transformative impact for steel. Collaborating with SSAB and the wider FutSteel ecosystem allows us to fast-track the deployment of our technology in one of the world's most carbon intensive industries."

Jarmo Lilja, Process Development Manager, SSAB, said: "We see great potential in Coolbrook's RotoDynamic Heater technology to support the electrification of high-temperature steelmaking processes. Advancing innovative solutions like RDH™ is essential to accelerating the steel industry's transition toward lower-emission production, and our collaborations within the FutSteel ecosystem help bring promising technologies closer to industrial deployment."

This funding will enable advanced process modelling, equipment, and IPR activities to support the accelerated development of RDH™ technology.

Conclusion

The FutMet initiative supports Business Finland's goal of strengthening Finland's industrial competitiveness by helping develop leading ecosystems for exporting green technologies. On June 23, 2026, the University of Oulu confirmed that the FutSteel project in collaboration with SSAB and industrial partners has been selected as part of the Sustainable World through Steels research programme, and that the project timeline is 2026 through 2029.

■ *Strategic Resources Inc. / Hycamite / Coolbrook*

FLAT STEEL PRODUCTS

JSW Vijayanagar ramps up new steelmaking facilities in India

A new steelmaking facility with new meltshop and continuous casters has been successfully commissioned at the new flat steel complex of the Toranagallu works in Karnataka. The project comprises the first installation in India of a primary dry dedusting system for 350-ton converters, setting a new environmental benchmark for the steel industry in the country.



The new steelmaking facilities at the Toranagallu works in Karnataka handle a wide variety of steel grades (Picture: Primetals Technologies)

Plant technology supplier Primetals Technologies has significantly deepened its long-term technology and project partnership with Indian JSW Steel group through the successful commissioning of a new steelmaking complex at JSW Vijayanagar Metallic Limited's (JVML's) Toranagallu plant in Karnataka.

The company has successfully started up a new melt shop and two continuous casters at JVML's facility in Toranagallu, Karnataka. The scope of supply for Primetals Technologies included technological installations as following:

- two 350-ton LD (BOF) converters,
- primary dedusting systems,
- two 350-ton ladle furnaces,
- secondary dedusting for the entire meltshop, and
- two 2-strand continuous casters,

along with comprehensive Level 1 and Level 2 automation for the converters, ladle furnaces, and casters.

The first converter, commissioned already in December 2024, achieved an exceptionally fast ramp-up, reaching more than 20 heats per day by the end of the commissioning month. It completed 220 heats in the first three weeks and over 400 heats within the first month of operation. The initial lining campaign reached more than 6,000 heats, setting a new benchmark in steelmaking. Primetals Technologies has received the final acceptance certificate (FAC) for the first converter, ladle furnace No. 1, and caster No. 1.

The second converter, commissioned in August 2025, achieved an even faster ramp-up, reaching more than 20 heats per day by the sixth day after commissioning.

Primetals Technologies has also received the FAC for the second converter, ladle furnace No. 2, and slab caster No. 2.

Advanced primary dry dedusting system and automation

This project marks Primetals Technologies' first installation in India of 350-ton converters equipped with an advanced primary dry dedusting system. The system includes a steam-type heat recovery system, a dry electrostatic precipitator (ESP), and low-consumption axial-type ID fans, helping to improve energy efficiency, reduce water consumption, and meet environmental regulations. A gas cleaning plant with a gas recovery system, which significantly increases energy recovery, completes the dedusting solution.

For the LD converter (BOF) plants, Primetals Technologies supplied converter top lances, tilting drives, the Vaicon Stopper slag retention system, valve stands, and a material handling system.

The two continuous slab casters, each with two strands, produce slabs with widths ranging from 900 to 1,650 millimetres and thicknesses of 220 or 260 millimetres. They handle steel grades ranging from ultra-low-carbon to high-carbon, including deep-drawing, structural, peritectic, and HSLA grades, as well as microalloyed and low-alloy steels, strip grades, and high-silicon electrical steel.

Technology features include DynaPhase phase-transformation modeling, LevCon mold-level stability, and the LiquiRob robotic system for safe operation. Additional features include DynaGap Soft Reduction 3D, the Dynacs 3D cooling model, and Quality Expert for online slab quality assessment.

| Primetals Technologies

HOT STRIP QUALITY MANAGEMENT

Hydraulic rotary side guides at the downcoiler entry

Danieli Seven-Life Side Guides have been successfully commissioned at Hoa Phat Dung Quat on the QSP® line. Installed at the exit section before the downcoiler entry, the systems assure strip stability and improve the quality of the coils.

Mission completed. The Seven-Life Side Guides system combines fully hydraulic, force-controlled strip guidance with an automatically rotating wear-disk design
(Picture: Danieli)

Hoa Phat Dung Quat Integrated Steel Complex has successfully commissioned Danieli's Seven-Life Hydraulic Side Guides on the QSP® (Quality Strip Production) line at its works in Dung Quat, Vietnam.

The installation is part of the continuous improvement programme for the QSP line, where stable strip guidance at the downcoiler entry is critical to ensure consistent coil geometry under demanding rolling conditions.

The technology in detail

The Seven-Life Side Guides system combines fully hydraulic, force-controlled strip guidance with an automatically rotating wear-disk design, ensuring uniform wear distribution and extended service life. The solution replaces conventional fixed wear-plate side guides, reducing localized wear and manual maintenance activities.

Integrated with the QSP line process control philosophy, the side guides support improved strip centring at the coiler entry, reducing the risk of telescopic coils, enhancing strip edge protection, and extending the maintenance intervals. Stable and repeatable guidance is ensured throughout the entire coiling cycle, including tail-out and deceleration phases.

Operational feedback from Hoa Phat confirms the benefits of the new system. Since commissioning, the rotary side guides have delivered more consistent strip guidance and improved coil shape, particularly during tail-out. Compared with



the previous fixed, flat side-guide system, which required frequent weld rebuilds and replacement, the rotating wear disks provide even wear and simplify replacement, significantly reducing material and labour maintenance costs while increasing equipment reliability under high-quality steel production conditions.

Commenting on the installation, Cao Tien Ngoc, Director of Hoa Phat Dung Quat QSP®, highlighted the operational impact of the new solution: "Since the introduction of Danieli's Seven-Life Side Guides, we have observed a clear improvement in the stability of the coiling process. Strip guidance is more consistent, especially during tail-out, thus allow perfect coil shape."

Adding on the maintenance friendly of new guides system, Vu Thanh Trung, Manager of QSP Maintenance explained: "Previously, the fixed flat side guide system wore out quickly. During weekly maintenance days, we had to perform weld rebuilds on the worn areas, and after just 2–3 such weld rebuilds, it had to be replaced, leading to high maintenance costs and

affecting equipment stability. With the new Rotary Side Guides system, the working surface of the worn part wore evenly thanks to the rotation mechanism. The lifespan of each side of the rotary disc reached about 6 weeks, with a total usage time of a part of at least 12 weeks at a rate of approx. 62,000 t per week. At the same time, replacing the worn part is much simpler, significantly reducing material and labor maintenance costs, and, especially, increasing equipment reliability, performing well under high-quality steel production conditions."

The Danieli-supplied QSP® line at Hoa Phat Dung Quat has now exceeded 16 million tons of hot-rolled coil production, serving both domestic and export markets. The installation confirms the suitability of Danieli's Seven-Life Side Guides for high-productivity and compact rolling concepts, such as QSP®, where process stability and equipment reliability are essential to achieving competitive operating costs and consistent product quality.

| Danieli

HEAVY PLATE

New hot straightening machine commissioned at Salzgitter group company

Salzgitter Mannesmann Grobblech, a company of German Salzgitter group, has expanded its heavy plate processing capabilities with its largest investment in over 20 years. The new facility highlights the Salzgitter Group's position as a prominent player in the infrastructure and wind energy sectors

Installed at the Salzgitter Mannesmann Grobblech GmbH heavy plate works in Mülheim an der Ruhr (North Rhine-Westphalia/Germany), this completely new facility marks an important step for future developments of the company. The new hot straightening machine – one of the largest single investments ever committed at the site – is now operational. In completing this project, the Salzgitter AG subsidiary has expanded its capabilities in sheet metal processing. The company improves its access to new applications and markets, particularly in the energy infrastructure sector. The hot straightening machine – developed in collaboration with the Austrian engineering company Buma Engineering & Anlagenbau GmbH to meet special and specific requirements – enables the production of particularly thick sheets exhibiting high strength. These sheets are used, for example, in the foundations and support structures of offshore wind turbines.

A double digit million amount was invested in Mülheim to dismantle the old machine and install a new, more powerful system, tipping the scales at a total weight of 1,100 metric tons. Implementing the

Without high-performance steel products, the energy transition cannot succeed.

Gunnar Groebler, Chairman of the Executive Board of Salzgitter AG

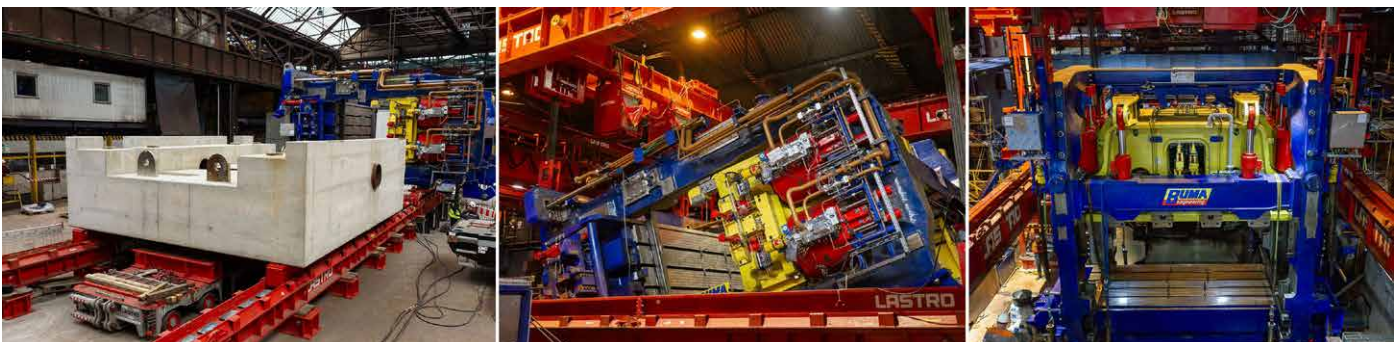
project required many years of detailed planning. Special tracks were installed over the cooling beds for the installation, which allowed for the foundation to be put down and the installation of the new system, while also facilitating the demolition of the old machine. In spite of the extensive work involved, thanks to forward-thinking and precise planning, only a brief shutdown was required in Mülheim for dismantling, installation, and commissioning.

Gunnar Groebler, Chairman of the Executive Board of Salzgitter AG: "Without high-performance steel products, the energy transition cannot succeed. With the commissioning of the new hot straightening machine, we are underlining the role of the Salzgitter Group – with its heavy plate specialists Salzgitter Mannesmann

Grobblech and Ilsenburger Grobblech – as a full-service provider of steel for the energy infrastructure in the wind power sector. This will improve our competitiveness and position us to further tap into future markets."

Hans-Jaan Rachner, Managing Director of Technology and Finance at Salzgitter Mannesmann Grobblech GmbH: "Thanks to our investment in the hot straightening machine, we – as specialists in heavy plate – are able to further expand our expertise in the infrastructure sector for the future market of wind energy. Special thanks go to our project team, headed by Daniel Rauße, whose outstanding work made it possible to launch production at the new facility on schedule."

Salzgitter AG

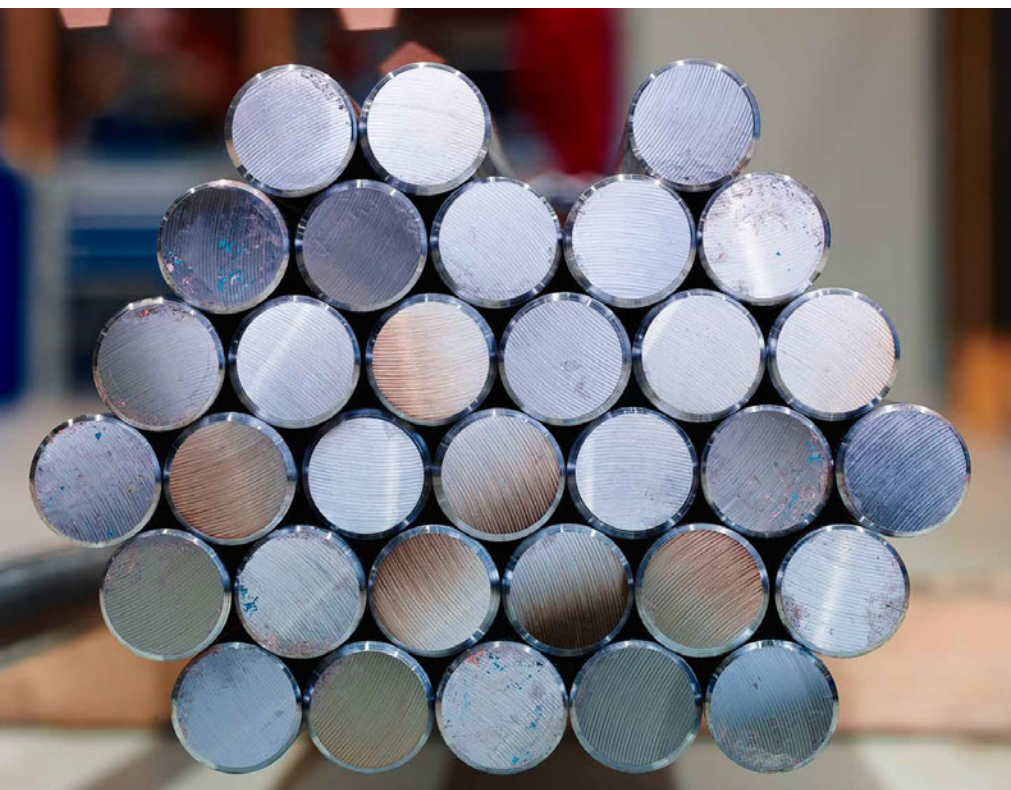


Installation of the new hot straightening machine at Salzgitter Mannesmann Grobblech in Mülheim, Germany (Picture: Salzgitter AG)

DIGITALISATION

EPD – Environmental Product Declaration: the quick and easy way

Nordic steel producer Ovako has developed a new digital EPD tool. Based on automated calculations it reduces months of manual work to a matter of minutes. The platform allows product-specific environmental data across the steel's life-cycle to be generated quicker than ever before. With mounting pressure from customers, regulators, and public procurement, steel buyers can now stay ahead of the curve on transparency.



Ovako's EPD tool is backed by robust, article-specific environmental data for all of the company's steel products (Picture: Ovako)

A new digital Environmental Product Declaration (EPD) tool from specialty steel producer Ovako is the first of its kind, cutting the lead time for compiling product-specific EPD data from months to mere minutes.

Launched in September 2026, it leverages digital and life-cycle assessment (LCA) expertise from industry partners and third-party verification from Bureau Veritas. The tool will enable customers to access robust, article-specific environmental data for any steel products they purchase from Ovako.

Shortcut of documentary practices

EPDs are increasingly important across industrial value chains. Customers are facing growing expectations to understand and document the environmental performance of the materials in their products. Beyond carbon footprint, an EPD communicates a broader set of environmental indicators, including resource use, acidification, eutrophication, water deprivation and waste, assessed across a defined life-cycle scope.

But producing a verified EPD for a specific steel product has traditionally been slow and resource intensive. It can require specialist life-cycle assessment, substantial manual data collection and several months of work before a declaration can be verified and published. This has made it difficult for steel users to obtain product-level data quickly when responding to tenders, reporting requirements or requests from downstream customers.

Ovako's pre-verified EPD tool changes that. It aggregates data on a product's steel grade, production processes, material input, energy, emissions, waste, transport and LCA impact data to automatically calculate EPD results specifically for each unique article delivered to the customer.

Users can select an article and generate an EPD draft containing environmental data for the product, including Global Warming Potential expressed as kilograms of CO₂ equivalent per ton, broken down across raw materials, transport and production modules. The first version of the tool covers all products made at Ovako's Hofors, Imatra and Smedjebacken sites.

Sophisticated digital base of data

The new capability builds on Ovako's existing Carbon Calculator and gives customers a practical choice of documentation: published general EPDs, article-specific EPD data provided directly in a business-to-business context, or a formally verified and published product-specific EPD where required.

The tool is pre-verified by Bureau Veritas and approved for use within the International EPD System. A product-specific EPD intended for publication still undergoes an independent, simplified third-party



Nicklas Magnusson is Head of Group Sustainability & Safety at Ovako Group

(Picture: Ovako / Richard Paulsson)

ty review before publication, helping ensure the declaration meets the relevant standards and requirements.

The project has been delivered in close collaboration with Astrada, the developer and maintainer of the digital EPD tool; and Miljögiraff, which contributed its life-cycle assessment and methodological expertise. The platform integrates article-level information with the established calculation logic and enables users to generate article-level results and EPD documents efficiently.

Conclusion

“Customers increasingly need environmental information for the actual steel product they buy, that is specific, credible and available when decisions are being made — not months later,” said Nicklas Magnusson, Head of Group Sustainability & Safety, Ovako Group. “Our new EPD tool makes that possible. It gives us a scalable way to translate the detailed data

Our new EPD tool translates the detailed data behind Ovako’s production into reliable, product-specific information.

Nicklas Magnusson, Head of Group Sustainability & Safety, Ovako Group

behind Ovako’s production into reliable, product-specific information that helps customers meet their own transparency and sustainability requirements.”

The launch is an important step in Ovako’s long-term work to make product environmental data more accessible, precise and useful. As supply chains face

increased demand for credible environmental information, Ovako’s EPD tool will help customers move faster from data to declaration.

Ovako

THE RIGHT TOOL FOR THE JOB

How one forklift has delivered safe operations for decades

The story of the first-ever Combilift C-Series demonstrates the lasting value of choosing the right solution. Still in operation after 28 years, the original multi-directional forklift has helped transform the company's handling of long loads, improving safety, increasing efficiency, and proving that purpose-built equipment can deliver exceptional returns for decades.

Based in Monaghan, J.G. Kelly Supplies Ltd is a top supplier of building materials in Ireland. The company operates three strategically located branches across the country. The main focus is on B2B clients, and the company supplies all hardware merchants nationwide with weekly delivery options available.

Before the company started operating a Combilift, traditional forklift methods created significant operational and safety challenges. Long stillages measuring up to six metres had to be moved through a doorway only four metres wide. Conventional counterbalance forklifts could not handle the task safely or efficiently.

Operator Tony McManus explains: "Before, we just used to use counterbalance trucks. We had to reverse a lorry in here and were on a main busy road in the town." He adds: "But now, it just pulls up in the loading bay. We can offload it safely, both sides if needed, with minimal obstruction to traffic."

Solution to move long loads safely, with great control and stability

The C-Series' multi-directional capability provided the ideal solution, allowing operators to move long loads sideways with greater control and stability, while navigating tight spaces and narrow doorways safely and efficiently.

For nearly three decades, the C-Series has transformed the site operations and the way the company used to handle long loads. And the benefits extend beyond traffic disruption. It has also shortened unloading times and significantly improved safety for operators, pedestrians, and passing vehicles.

McManus continues: "With the C-Series, it's less labour intensive than it used to be. It would take a lot of people to



J.G. Kelly Supplies Ltd operator Tony McManus (left) and Managing Director Paul Kelly (right) (Picture: Combilift)

Combilift are very good at having a look at what you need and then they can tailor the product to suit you.

Paul Kelly, Managing Director at J.G. Kelly Supplies Ltd, Monaghan, Ireland

offload containers before, but now, one operator can offload a container in a short space of time compared to before."

An additional safety feature is the forklift's integrated platform, which has fur-

ther enhanced load stability when handling such long products. Operators can now safely support lengthy stillages during transport, reducing the risks associated with moving oversized loads and mak-



The success of the original C-Series led J.G. Kelly Supplies to expand its fleet with additional Combilift products

(Picture: Combilift)

ing the entire process more controlled and efficient.

McManus adds: "We know that it's a lot safer, once you get the load on the platform, you can sort of relax almost. You've got that stability of it being on the rest beds." Safety on site has been greatly improved by the introduction of the C-Series, but equally remarkable is the machine's longevity.

Managing Director Paul Kelly highlights: "I never expected we'd still be using the same forklift nearly three decades later. But it's a testament to the build quality of the machine as it's still running after 28 years." While multiple conventional forklifts have come and gone over the same period, the original C-Series remains in operation. Its continued performance is attributed to robust engineering, regular preventative maintenance, and responsive local support.

McManus mentions: "It doesn't really take much maintenance. We have changed filters or timing belts over the years, but it's still got the original engine from when it arrived here." Routine checks of oil, coolant, hydraulics, tyres, and greasing have helped keep the machine operating reliably, while major repairs have been rare throughout its 28-year lifespan.

Having a machine out of action can have a major impact on day-to-day operations. However, according to McManus, that has rarely been an issue. "In 28 years, it's very rarely had to be taken away for

repairs," he says. "Any issues we've had have usually been fixed on site, and quickly. That's the main thing, because if the machine is out of action for any length of time, we're in trouble."

The success of the original C-Series led J.G. Kelly Supplies to expand its fleet with additional Combilift products, including other Combilift models, such as the pedestrian Combi-CS and an Aisle Master in their Limerick warehouse. The company continues to value Combilift's ability to tailor equipment to specific operational requirements rather than offering a one-size-fits-all solution.

Kelly highlights: "Combilift are very good at having a look at what you need and then they can tailor the product to suit you. We had the height of the mast and weight limit tailored to what we needed in our Combi-CS."

Today, the first-ever multidirectional C-Series stands as a powerful example of how investing in the right material handling solution delivers lasting returns. Nearly three decades after it was manufactured and operated for the first time, the forklift continues to enhance operations, driving productivity, improving safety and maximising storage space while proving that quality engineering and preventative maintenance can stand the test of time.

■ Combilift



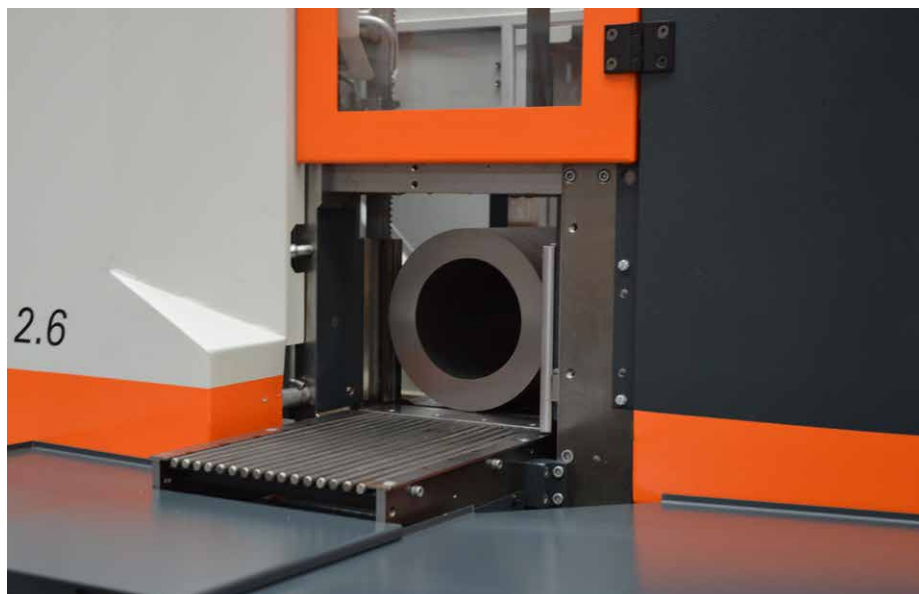
It is a testament to the build quality of the machine as it's still running after 28 years.

(Picture: Combilift)

PROVEN IN PRACTICE FOR YEARS AND NOW FURTHER DEVELOPED

Automatic sawing technology with a lead

The new vertical bandsaw series from Kasto is more compact, energy-efficient, and easier to access. Featuring an electromechanical saw feed and a new control system, this series enhances ease of use and offers greater transparency. The machine tool can be seamlessly integrated into a fully automated sawing centre.



The KASTOssb is suitable for challenging cutting applications involving solid material, tubes, profiles and bundles (Picture: Kasto Maschinenbau)

The vertical bandsaw KASTOssb has acquired renown for its reliable sawing technology, outstanding versatility, and robust machine quality. The latest development of the new heavy-duty, high-performance automatic machine draws on four decades of practical experience. This is particularly evident in the saw feed system: the engineering design team replaced the previous hydraulic actuation with servomotors. This electromechanical drive consumes power only when cutting is actually performed. The result: a more energy-efficient and quieter production process. Automatic feed control is included as a standard feature. With KASTO-respond, the system automatically adjusts parameters to suit each application, helping to optimise cutting times.

Maintenance and accessibility. Partitioned panels and hinged rear doors offer easier access to the bandsaw blade and other key components while allowing for more space-efficient installation. A new

front inspection window provides a clear view of the working area, roller conveyor, and material infeed.

Intelligent software. The newly launched KASTO ProControl generation of control systems enhances operation efficiency, intuitiveness, and transparency. The dashboard and Simple Mode are designed to assist with daily tasks, while features such as the material library, cutting plan, and intelligent cutting optimisation help save both time and materials. Additionally, diagnostic and analysis tools help pinpoint faults more quickly, reducing downtime.

Flexible and space-saving chip conveyor

The new chip conveyor can be installed on either the right or left side, allowing the customer to specify the preferred discharge direction when placing an order. This feature provides greater flexibility when integrating the conveyor into existing on-site

production processes. Its upward-conveying design minimises the risk of blockages, complies with current safety standards, and reduces coolant carryover. Depending on the application, discharge heights of 600 mm or 1,050 mm are available.

For easier installation and removal, the conveyor is now equipped with rollers. The new design allows for a 30-degree rotation when the conveyor is installed on the left side, making it easier to pull out. The modification reduces the space required for removal (when the chip conveyor discharge height is 600 mm) from 3.6 metres to 2.9 metres. This enhancement allows users of this already compact machine to save even more valuable space on the factory floor.

Excellent sawing precision saves material and time

The new programming system also improves positioning and cutting precision. Machines in the KASTOwin 107 series, equipped with ProControl, have demonstrated exceptional consistency in cutting lengths within the specified tolerance range. This level of precision is also achieved with the new KASTOssb: in a series of measurements performed on a KASTOssb FC 2.6, using C45 round bar stock with a diameter of 90 mm and a target cut length of 10.00 mm, the average cutting length was 10.011 mm, with a standard deviation of 0.048 mm. These precise and reproducible cut lengths allow for smaller cutting allowances, leading to savings in both material and time during downstream processing operations.

Low-vibration and versatile design

A significant factor contributing to high cutting quality and productivity is effective vibration management. Consequently, a proven core element of the KASTOssb

For over 20 years, we have relied on KASTOssb saws and other KASTO solutions. They are dependable, require minimal maintenance, and can be used for a variety of applications.

Alexander Palli, workshop manager at EHG Stahlzentrum GmbH & Co. OG

series that remains unchanged is the mineral cast saw head. This material is known for its excellent damping properties, which effectively reduce vibrations. The advantage is particularly important during bundle cutting, especially when cutting tubes and profiles with diameters of up to 260 mm, as well as when using carbide bandsaw blades. These blades are now explicitly included in the range of applications. Furthermore, there is an option to use a 34 mm-wide band.

From a standalone machine to a fully automated line

The KASTOssb is available in two versions: the AC 2.6, which can be used as a standalone unit or with a roller conveyor, and the FC 2.6, which features automated material loading along with infeed and outfeed capabilities. The FC version can also be expanded with KASTOsort for automated robotic handling and integration with storage systems. These options offer a compact and scalable automation platform, making it suitable even for mid-sized companies.

The KASTOssb can be seamlessly integrated into the new, fully automated KASTOcenter compact sawing centre. This modular system combines a tower storage unit, robotic loading and unloading, sawing, and downstream machining. Together, these features create a system capable of 24/7 operation within a minimal footprint.

Kasto Maschinenbau GmbH & Co. KG, Achern, Germany

The electromechanical saw feed featured on the KASTOssb AC 2.6 consumes power only when cutting is actually performed

(Picture: Kasto Maschinenbau)



Alexander Palli, workshop manager at EHG Stahlzentrum GmbH & Co. OG (Picture: Kasto Maschinenbau)



MARKET REPORT

Global forecast of demand for electrical steel up to 2031

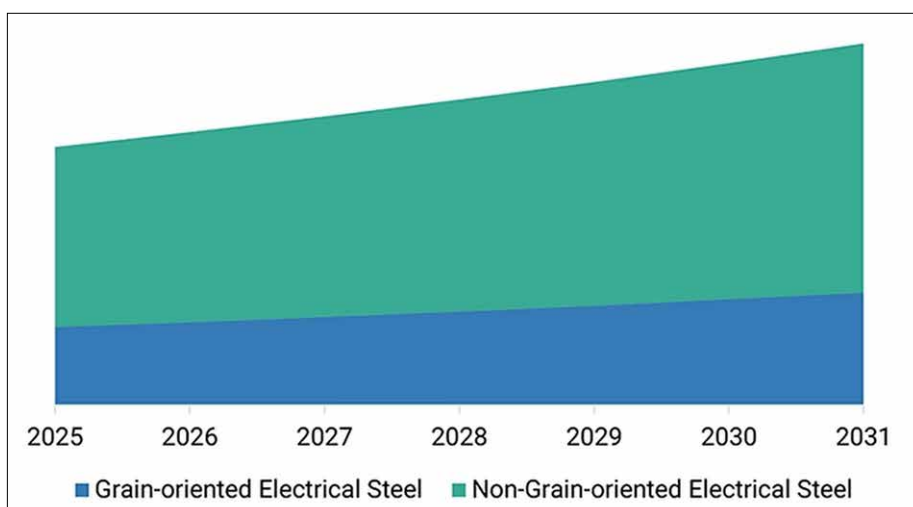
According to an exclusive report released by MarketsandMarkets™ the global market for electrical steel is projected to grow from USD 62.93 billion in 2026 to USD 83.23 billion by 2031, representing a compound annual growth rate (CAGR) of 5.8% during this period

The use of electrical steel is gaining traction in industries such as energy and mobility, making it essential to the electrical power generation and transmission. Electrical steel is a specialized steel engineered to deliver excellent magnetic performance and is typically used in electromagnetic applications such as transformers, motors, and generators. Electrical steel is made by combining silicon with iron (steel) and is processed using advanced rolling and annealing techniques to provide low core loss, high permeability, and improved energy efficiency.

Electrical steel can be divided into two categories: grain-oriented and non-grain-oriented. Each type has specific application requirements based on the requirements of directionally or isotropically operating magnetic field performance. The properties of electrical steel are improved through both precision processing and coating technologies, so that electrical steel is vital to the creation of high-efficiency, low-loss electrical systems.

By type, the non-grain-oriented electrical steel is the largest

By type, the non-grain-oriented electrical steel segment is expected to be the largest in the forecasted period with 69.7% market share in 2025. However, the Grain-Oriented Electrical Steel (GOES) segment is expected to register the fastest CAGR during the forecast period due to growing requirements for high-efficiency power transformers, due to a modernizing and expanding grid. GOES has been specifically manufactured to provide greater alignment of magnetic flux along a single axis, which dramatically reduces core losses in both transmission and distribution transformers. Investment in renewable energy, where



By type, the non-grain-oriented electrical steel segment is expected to be the largest in the forecasted period, but the GOES segment is expected to grow faster (Picture: MarketsandMarkets)

efficient, long-distance transmission/transportation is essential, is driving growth in the more advanced grades of GOES. Additionally, in developed economies, high-efficiency transformers are replacing aging current transformers. Also, in developing economies, the increasing use of electricity as more consumers gain access is boosting demand for GOES transformers. Developmental innovations in coatings and refinement processes for GOES have improved performance, establishing GOES as one of the most important materials for next-generation energy systems.

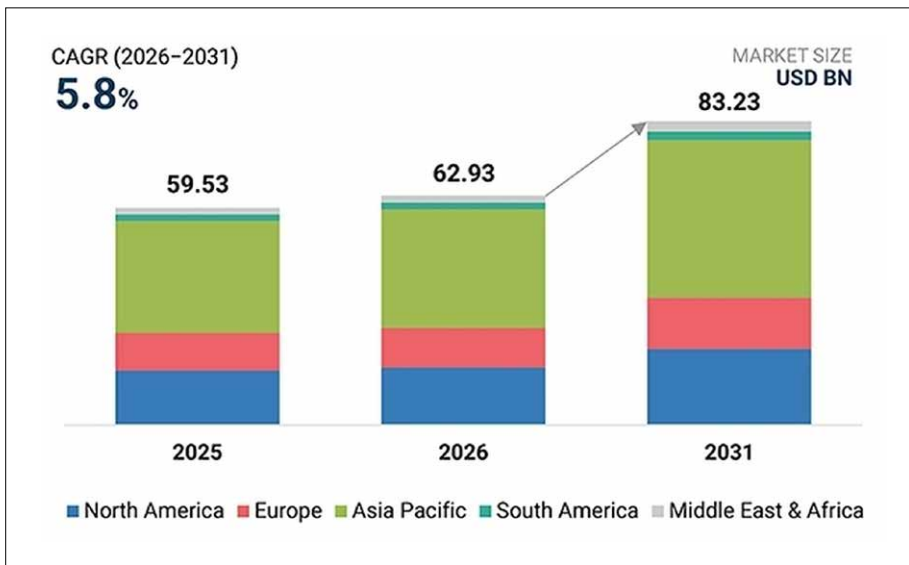
By application, the transformers segment is the fastest

The transformers segment is expected to register the fastest CAGR of 43.9% during the forecast period, driven by increasing demand for grid expansion, renewable energy integration, and cross-border power transmission systems. As electricity

consumption continues to rise and energy systems become increasingly decentralized, utilities are installing more advanced and efficient transformers made from high-quality electrical steel to reduce core losses and improve load management. Moreover, the increasing complexity of power flows due to intermittent renewable resources has created a strong need for transformers that are more reliable and high performing. The replacement of aging grid infrastructure in developed nations, as well as electrification and rural connectivity projects in developing countries, are also substantially driving up demand. The combination of these trends will drive significant growth in the use of electrical steel in the transformer product segment.

By end-use industry, the energy segment sets the pace

The energy segment dominated the market in 2025, accounting for 52.9% of the market



Asia Pacific region accounts for a significant share and wealthy growth during the forecast period (Picture: MarketsandMarkets)



Storage of GOES coils (Photo from the archives: worldsteel/Robert Kolykhalov)

share. The energy sector is anticipated to experience the fastest CAGR during the forecast period due to the drastic transition towards low-carbon and electrified infrastructures occurring within the worldwide electrical systems. A growing number of investments will be made in renewable energy projects, including wind and solar, thereby creating high demand for high-voltage electrical steels for use in generators, transformers, and grids. A growing need exists to manage variable power generation and maintain grid stability; therefore, manufacturers are advancing their production of next-generation electrical products with superior magnetic properties. In addition, demand for electricity is increasing due to the expansion

of transmission networks, the electrification of rural communities, and the integration of large-scale energy storage. As countries work towards improving energy efficiency and meeting decarbonization targets, the electrical steel industry will grow quickly compared with other global industries (electricity has about 1/3 of the average total sales of other manufacturing industries).

Regional trends and hidden champions

Asia Pacific accounted for a significant share of 51.6% in 2025. The Middle East & Africa region is expected to register the fastest CAGR during the forecast period,

driven by rapidly increasing investment in all types of power infrastructure, grid expansion, and electrification initiatives. A major contributor to this increase in demand for electricity, and therefore the construction of new transmission and distribution systems, is the overall growth and urbanization of the population, which requires transformer equipment made from electrical steel. In addition, the growth of large-scale renewable energy projects (solar/wind) is generating significant demand for efficient grid integration and creating opportunities for new methods to reduce transmission losses and improve energy efficiency in the country, all of which are driving demand for new electrical steel grades. The ongoing growth of industrialization and the diversification of economies away from oil will continue to support the long-term growth of the Middle East and Africa as an emerging market for all types of electrical steels.

Key players

ArcelorMittal (Luxembourg), POSCO (South Korea), China Baowu Steel Group Corporation Limited (China), voestalpine AG (Austria), and Nippon Steel Corporation (Japan) were identified as star players in the electrical steel market (global), given their strong market share and product footprint. The electrical steel market comprises even more major players such as Steel Authority of India Limited (SAIL) (India), Tata Steel (India), and thyssenkrupp AG (Germany). Cleveland-Cliffs Inc. (US), Hebei Puyang Iron and Steel Group (China), JSW Steel (India), Angang Steel Company Limited (China) have distinguished themselves – among startups and SMEs – by securing strong footholds in specialized niche areas, underscoring their potential as emerging market leaders. Partnerships, acquisitions, and expansions are among the major strategies adopted by these key players to enhance their positions in the electrical steel market.

MarketsandMarkets

Reference

- [1] Electrical Steel Market by Type, Application, End-use Industry, and Region – Global Forecast to 2031. 250 pages, 300 tables, 60 figures. MarketsandMarkets™ INC., Delray Beach, FL (USA)

AYHAN TAKIM ÇELİK COMMISSIONS VACUUM HEAT TREATMENT SYSTEM

Aichelin has installed and commissioned a new vacuum heat treatment system at Turkish tool steel supplier Ayhan Takım Çelik A.Ş. The investment considerably expands the company's heat treatment capabilities.

The supplied system comprises a vacuum gas quench furnace with 10 bar nitrogen quenching and a vacuum tempering furnace. Designed for treatment loads of up to 1,500 kg, the installation combines oxidation-free heat treatment with precise temperature control, enabling outstanding material properties, excellent surface quality and highly reproducible process results for demanding tool steel applications. The system has been fully integrated into Ayhan Takım's production environment fol-



Vacuum furnaces installed at Ayhan Takım Çelik A.Ş (Picture: Aichelin)

lowing successful commissioning and final acceptance.

| Aichelin

BULL MOOSE TUBE ACQUIRES HANNA STEEL

Bull Moose Tube Company has successfully completed its acquisition of Hanna Steel Corporation. Hanna Steel will now operate as a division of Bull Moose Tube Company.

Bull Moose Tube Company is part of the Caparo Bull Moose group of companies. The company operates manufacturing facilities across the United States and offers a large range of welded steel tubing in North America. Hanna Steel Corporation is headquartered in Hoover, Alabama, with

tubing operations in Tuscaloosa, Alabama, and Pekin, Illinois. The company also operates a coil-coating facility in Fairfield, Alabama, and Hanna Truck Line, its in-house transportation business.

| Bull Moose Tube Company

KLOECKNER METALS RECOGNIZED FOR EMPLOYEE WELL-BEING

Kloeckner Metals Corporation has received two significant workplace wellness honours in 2026: recognition as one of the Atlanta Business Chronicle's Healthiest Employers and the Bronze Well Workplace Award from the Wellness Alliance.

These achievements recognize Kloeckner's commitment to building a workplace where employees are supported, engaged and empowered to thrive. Since launching its wellness initiative, Kloeckner has implemented a number of programs designed to make well-being more accessible for employees and their families. These efforts include expanded mental health

resources, enhanced employee assistance services, wellness incentives such as a wellness stipend, an online wellness hub and a network of wellness ambassadors who help promote resources and encourage participation across the organization.

| Kloeckner Metals

THYSSENKRUPP AUTOMOTIVE TECHNOLOGY TO REALIGN CHASSIS ACTIVITIES IN THE US

thyssenkrupp Presta North America, LLC, part of the thyssenkrupp Automotive Technology segment, plans to close its production site in Terre Haute, Indiana, by March 31, 2027 as part of the segment's ongoing transformation.

The affected U.S. production activities in the chassis business are expected to be

reorganized going forward, with a focus on thyssenkrupp Bilstein of America, Inc. in Hamilton, Ohio. Terre Haute has produced steering components, while Hamilton focuses on shock absorber systems. By realigning the affected chassis activities with a focus on Hamilton, the company aims to create a clearer U.S. setup in this area, reduce interfaces and establish a

sustainable long-term basis for existing and future customer programs. As part of this approach, the Hamilton site is expected to be further developed as a focused U.S. production base and selectively strengthened through targeted staffing measures.

| thyssenkrupp Automotive

NIPPON KINZOKU ESTABLISHES MASS PRODUCTION OF STAINLESS STEEL FOR INSULIN NEEDLES

Nippon Kinzoku has commenced mass production for its ultra-thin and narrow-width stainless steel optimized for laser welding in ultra-fine insulin needles. In response to growing global demand, the company has established a stable supply system for these high-quality materials.

Traditionally, insulin needle manufacturing involved forming tubes from 0.2 mm thick base materials using TIG or plasma weld-

ing, followed by repeated drawing and heat treatment to achieve ultra-thin gauges.

However, to meet surging global demand, the industry has increasingly transitioned to laser welding. This shift enables significantly higher welding speeds and allows for base materials to be over 50% thinner (e.g., 0.08 mm) from the initial stage. In response to numerous requests from global customers for high-quality materials optimized for laser welding, the company has conducted

extensive trials in collaboration with leading manufacturers. As a result, a system for the stable mass production and supply of thin-walled, narrow-width materials that meet the highest standards of quality and performance has been developed. The system maintains consistent weldability across the entire 4,000-m coil length, ensuring a stable supply for high-volume production.

■ *Nippon Kinzoku*

PERMA-PIPE AND WELSPUN TO FORM JOINT VENTURE IN JORDAN

Perma-Pipe International Holdings and Welspun Corp. have signed a memorandum of understanding with the developers of Jordan's National Water Carrier Project and the Government of the Hashemite Kingdom of Jordan to advance the development of pipe manufacturing and advanced coating facilities in Jordan.

The parties intend to establish a joint venture to support the development and oper-

ation of these facilities. Under the terms of the memorandum, Perma-Pipe and Welspun have partnered to establish an integrated pipe manufacturing and coating platform in Jordan capable of serving major water, oil and gas, energy, and infrastructure projects in the Kingdom and across surrounding regional markets.

The partnership is expected to bring together Welspun's large-diameter steel pipe manufacturing capabilities and Per-

ma-Pipe's expertise in anti-corrosion coating systems designed to protect pipelines from corrosion and extend service life, engineered piping solutions, and project execution expertise. Jordan's National Water Carrier Project is a strategic infrastructure initiative, designed to enhance long-term water security and address growing water supply challenges.

■ *Perma-Pipe / Welspun*

WAEZLHOLZ TO BUILD COLD-ROLLING MILL IN MEXICO

Waelzholz is advancing its global growth strategy and building its first cold-rolling mill in Mexico. Starting in mid-2028, the company will produce high-quality steel products for the North American market.

By opening its new production facility, located approximately 85 km west of Monterrey, Waelzholz is transforming its current sales presence into a full-fledged local manufacturing operation. This decision is a direct response to the significant market demand in the region. The new manufacturing facility on a site covering approximately 60,000 m². The new facility, located near Saltillo, will have an annual capacity of 50,000 t/year of customized steel strip products and cover the entire process chain of cold-rolling technology.

■ *Waelzholz*



Waelzholz is expanding its presence in Mexico (Picture: Waelzholz)

THYSSENKRUPP RASSELSTEIN TO BUILD PHOTOVOLTAIC SYSTEM



Dr. Thorsten Krenke, CTO of thyssenkrupp Rasselstein GmbH (left) and Frederic Wagner, Managing Director of VSB Integrated Energy Solutions GmbH signing the on-site power purchase agreement (Picture: thyssenkrupp)

thyssenkrupp Rasselstein is constructing a large-scale ground-mounted photovoltaic system on its plant premises in Andernach, Germany. The construction project is being carried out in collaboration with VSB Integrated Energy Solutions GmbH.

The photovoltaic plant is part of a comprehensive green power concept for the site and is being implemented under a Power Purchase Agreement (PPA). VSB Integrated Energy Solutions is responsible for the construction, financing and operation of the plant. thyssenkrupp Rasselstein is providing two sites and will purchase 100 percent of the electricity generated for an initial term of 20 years.

The steel substructure for the approximately 12,000 solar modules will be constructed using thyssenkrupp Steel's CO₂-reduced bluemint® Steel with the durable ZM EcoProtect® Solar coating, which was developed specifically for ground-mounted photovoltaic systems. The PV plant is being built directly on the factory grounds on two previously undeveloped areas and covers 5.2 hectares. With a peak capacity of 8 MW, it will generate approximately 8 GWh of electricity annually. The solar power generated will help reduce the site's and its products' carbon footprint in the future. Completion of the project is planned for mid-2027.

| *thyssenkrupp Rasselstein*

SANDVIK TO DIVEST ADDITIVE MANUFACTURING BUSINESS

Sandvik has signed an agreement to divest its additive manufacturing business unit to Mimir, a global investment firm based in Sweden. The transaction is expected to close in the third quarter of 2026, subject to customary regulatory approvals.

The business unit manufactures metal powders used in areas such as additive manufacturing, metal injection moulding and hot isostatic pressing, as well as controlled expansion alloys for specialized industrial applications. "This divestment is intended to better position the additive manufacturing business for its next

growth phase, and we believe the new owner will provide the platform and dedicated focus needed to further develop the business towards its full potential," says Stefan Widing, President and CEO of Sandvik.

| *Sandvik*

VOESTALPINE RAILWAY SYSTEMS EXPANDS IN CANADA

voestalpine is further expanding its global presence in the railway systems business segment and building a new production facility for high-quality turnout and rail components in Thorold, Ontario.

voestalpine Railway Systems, a full-service provider of railway infrastructure systems, will gradually ramp up production at the new site, focussing on components for turnouts and light rail systems. The facility is scheduled to be fully operational in the second half

of 2027. At the same time, a long-term supply agreement for the locally manufactured turnout systems has been signed with freight rail company Canadian National (CN).

■ *voestalpine*

NUCOR TO EXPAND PRODUCTION CAPABILITIES AT VULCRAFT INDIANA

Nucor Corporation will invest US\$ 59 million to expand its Vulcraft Indiana manufacturing facility in St. Joe, Indiana, adding capabilities to produce steel grating products.

Nucor acquired Vulcraft in 1962, marking the company's entrance into the steel

industry. Vulcraft Indiana opened in 1972 as Nucor's fifth Vulcraft facility and today is one of nine Vulcraft facilities operating across North America. The company is a leading producer of open-web steel joists, joist girders and steel decking, which are used primarily in non-residential construction. These products serve as structural

support systems for roofs and floors in warehouses, data centers, manufacturing facilities, retail stores, shopping centers, schools and hospitals, as well as in some multi-story residential buildings.

■ *Nucor Corporation*

SSAB SUPPLIES DECARBONIZED STEEL FOR BRIDGE PROJECT

SSAB has delivered the world's first bridge built using SSAB Zero™ steel, together with construction and civil engineering company Peab and bridge manufacturer Hjalmarssons. The bridge has now been installed in Lund, Sweden, as part of the Swedish Transport Administration's major infrastructure upgrade in the area.

The pedestrian and bicycle bridge is 39 m long and weighs just over 30 t. Approximately 95 % of the steel used in the bridge consists of SSAB Zero™. This steel is made using recycled steel and fossil-free electricity and biogas, resulting in fossil carbon emissions in SSAB's production of less than 0.05 kg CO₂e per kg of steel within Scope 1 and 2 according to the GHG Protocol.

The bridge was manufactured by Hjalmarssons in Sölvesborg. Since SSAB Zero™ has the same properties and processing characteristics as conventional steel, the production process could be carried out without any special adjustments.



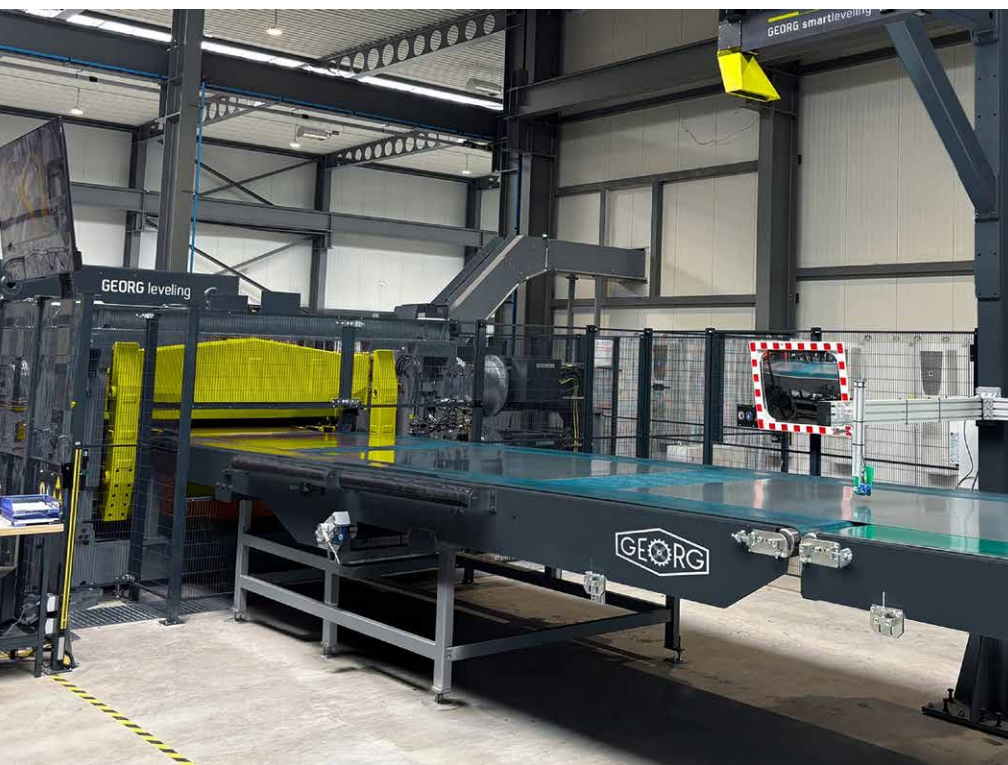
The first bridge built using decarbonized steel spans the E22 highway in Lund, Sweden.
(Picture: SSAB)

■ *SSAB*

STRIP PROCESSING

Assistance system enhances quality of strip levelling

The new assistance system 'smartleveling' has been developed for high-performance strip levelling machines. A key innovative feature of the system is that it measures the flatness of the strip after it has been cut to length. This means that the flatness data of the final products (i.e. sheets) is not influenced by any production-related cross-effects, allowing them to be used and further processed within the internal production system.



The flatness of the sheets is measured by an optical system (yellow measuring head at the top right) after the cutting process (Picture: GEORG)

The demand for high-performance levellers designed for the processing of wide strips and sheets that have to comply with highly exacting flatness and surface quality requirements is constantly growing. Examples of such products are exposed bodysell parts for the automotive and aviation industries, components for tanks, and visible construction elements such as cladding systems for ceilings and façades. Additionally, the variety of materials processed is becoming

increasingly greater, as well as the need to ensure complete and consistent documentation of the products supplied.

Process automation is a further important aspect, last but not least against the backdrop of the growing shortage of qualified labour. These challenges were reason for German machine tool manufacturer GEORG to develop an entirely new approach to optimizing the levelling process and the way it can be controlled. Levelling is a process designed to enhance

the quality of finished sheets in terms of flatness and minimized residual stress – criteria that are essential for the successful further processing of the material. So far, flatness used to be assessed manually by the operator or – if at all – by an optical system arranged after the leveller, but in any case, before the strip is cut to length. Due to the overlapping effects of the back-tension acting on the strip downstream of the levelling machine and the influence of the cutting process, the final product may have different flatness properties than the strip when it runs out of the leveller.

This gave rise to the idea to shift strip flatness measurement to a position downstream of the cutting process and use the measured data as input for optimizing the levelling process. GEORG smartleveling measures the flatness of the final product on the runout roller table, ruling out the possibility of the strip back-tension falsifying the results. The assistance system visualizes the measured values, analyzes them and provides the operator with recommendations for adapting the settings of the levelling machines, if necessary. It is also possible to use the system in an automatic mode to optimize the parameters.

In addition to higher levelling precision, the system provides various other benefits: The leveller settings can be adjusted based on as-is data of the finished products and in a largely automated way. The quality of the final products is thus no longer dependent on the skills of the individual operator. Additionally, suppliers can provide consistent documentation of the

*Dr.-Ing. Tobias Böcking, Head of Levellers, Heinrich Georg GmbH Maschinenfabrik, Kreuztal, Germany –
Contact: tobias.boecking@georg.com*

A leveller (left) arranged upstream of a cut-to-length line. Shown in the foreground are the change cartridges for the leveller (Picture: GEORG)

final products delivered to their customers. The measured data are also very useful for quality assurance and the traceability of production.

Advanced levelling – The technology in detail

The software of the new assistance system uses the data provided by an optical – hence non-contact – measuring system arranged at the runout of the cut-to-length line. To measure the elevation of the individual surface points, laser lines are projected onto the sheets when they pass the measuring head on the runout roller table, where they are not subjected to any back-tension. In order to compensate the changing position of the sheet, the system uses dual lines. This eliminates any interfering effects caused, for example, by vibration, and enables the system to measure the height profile with a precision better than 0.5 mm.

The flatness of the produced sheets is graphically displayed in real time on the operator's screen together with information relevant for the levelling process. The visualization makes it possible for the operators to quickly and intuitively assess



the quality of the sheets produced. As also the data of several previously produced sheets are shown, decisions can be instantly made – on the basis of data measured after the levelling process. The system compiles the data of all the sheets produced from each individual coil in the quality report and stores it in a database.

Smart automation

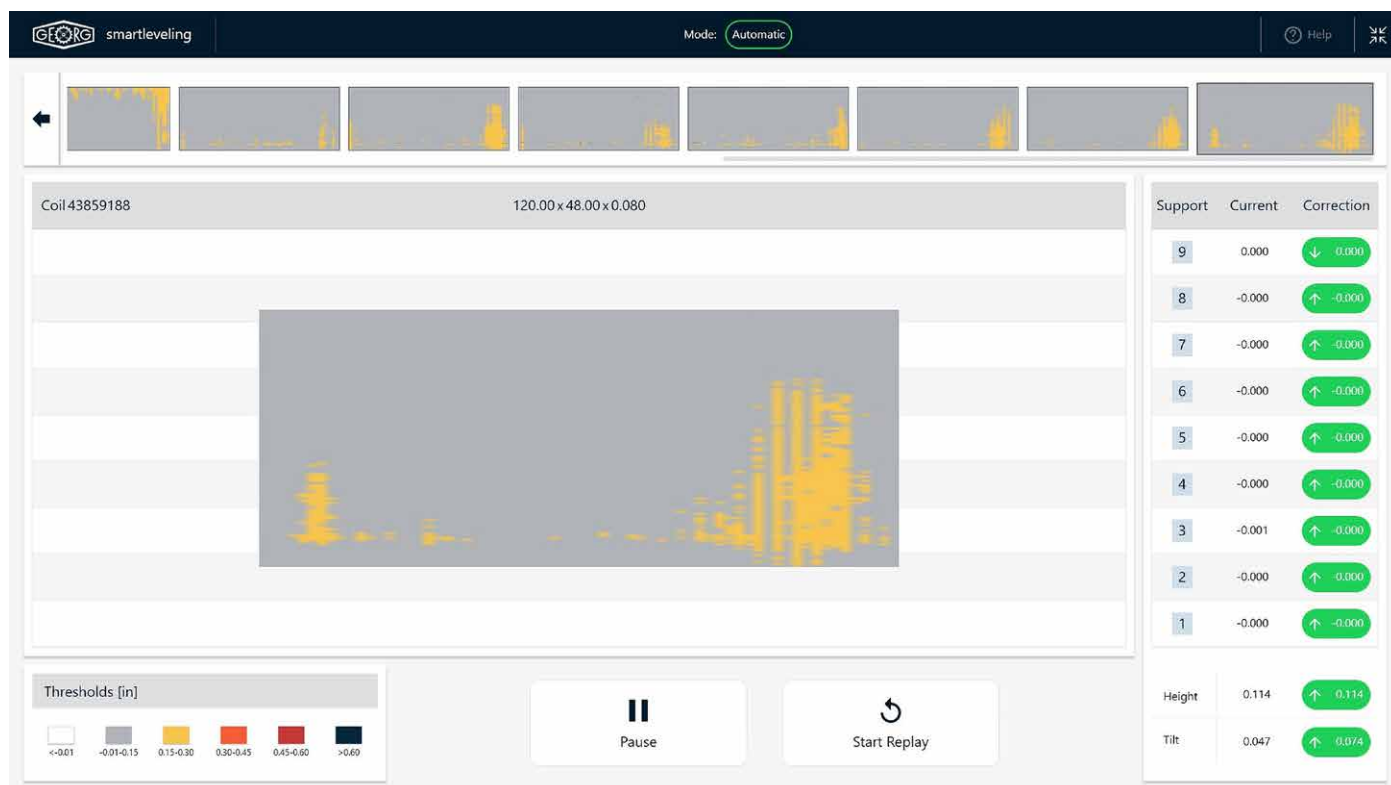
The flatness data are not only visualized, but also automatically analyzed. Based on this, the 'smartleveling' software continuously determines optimized parameters for the levelling machine. The parameters

are displayed as recommendations for the operators to decide whether the current process should be adapted. If run in automatic mode, the program adapts the process parameters of the leveller fully automatically. In this case, the consistent use of the data ensures precisely controlled processes and products of consistently high quality while increasing the overall productivity of the line. Additionally, this approach minimizes the loading and stress acting on the machine, reduces energy use and increases the lifetime of the components.

All data concerning the flatness of the sheets are archived complete with the relat-



The cartridge change system ensures that different cartridges can be changed in a highly time-efficient way and identical results are achieved after regrinding or maintenance (Picture: GEORG)



The display on the operator's screen shows the flatness values of the last sheet measured (below) as well as the previously levelled sheets (at the top) (Picture: GEORG)

ed production parameters. They remain available for later retrieval so that they can be used at any time in the future for levelling parameter optimization. Such a database of production parameters is extremely helpful, especially in steel service centres that handle comprehensive product ranges and complex materials, as it makes it possible to also call up levelling data relating to coils processed some time ago.

The operators generally already achieve very good levelling results with the basic machine settings calculated by GEORG for the respective materials. The basic settings are part of the supply scope of 'smartleveling', as well as the recipe database that can be filled with data by the customers themselves.

Application specialists can access the data stored in the database offline by means of the 'smartleveling' analysis tool. In this way, they can analyze how specific sheets were produced and provide support to further optimize the levelling process. The data can also be used for training purposes, for example, to familiarize operators new on the job with the production line.

Especially, wide and thin strips require high-performance machines that ensure

outstanding operating precision and backlash-free, exactly repeatable positioning of the levelling rolls. Here, GEORG can build on decades-long expertise in the construction of cut-to-length lines with integrated GEORG levellers that its customers use for the processing of a wide and varied range of products. All machines are characterized by excellent precision, repeatability, availability and longevity, features that have always been synonymous with GEORG.

The high-performance levellers from the German engineering company are available in modular design. The dimension range – for example, for exposed air-plane parts – includes sheets up to 3,200 mm wide.

An integral component of all GEORG levellers is the tried-and-tested cartridge change system that has proved highly effective and reliable in numerous cut-to-length lines. This system ensures that cartridges of the same type always provide exactly the same results, even after roll regrinding or maintenance. All these change cartridges are equipped with a digital coding that allows them to be reliably identified for the parameterization of the machines and for service and maintenance

activities. In this way, the control system of the levellers can compensate fully automatically any regrinding effects, ensuring the use of exactly the same process parameters.

The change cartridges are the core components of GEORG levelling machines. They are high-precision tools designed to withstand very high mechanical stresses during operation. Their design and manufacturing require profound and detailed knowledge. The same holds true for their maintenance. Therefore, the machine tool company offers line operators a service package that includes the service of having the change cartridges shipped to their workshop in Kreuztal, Germany at regular intervals for maintenance. This ensures that the levellers always operate with the same high precision.

Additionally, GEORG provides training courses both at its facilities in Kreuztal and at its customers' sites. The courses comprise theoretical knowledge and hands-on training, including the setting up and adjustment of the machine parameters or the levelling of individual sheets.

Heinrich Georg GmbH Maschinenfabrik, Kreuztal, Germany

STEEL MATERIALS

Are gas turbines ready for the hydrogen economy?

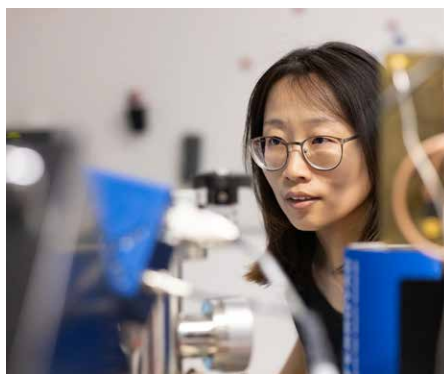
Fuelling gas turbines for power generation and aviation with fossil fuels accounts for 15% of global CO₂ emissions. Fuelling them with hydrogen is a sustainable alternative, however, it remained unknown so far how hydrogen affects Nickel-base superalloys, the key material in turbines, at elevated temperatures.

Hydrogen is widely regarded as a promising alternative fuel for gas turbines used in power generation and aviation. However, before hydrogen can be used safely on a large scale, researchers need to better understand how it affects the materials exposed to the extreme operating conditions inside turbines.

While the interaction between hydrogen and metallic materials has been extensively studied at ambient temperatures, far less is known about its effects at elevated temperatures found in gas turbines. An international team of researchers has now investigated how hydrogen affects Nickel-base superalloys – the material of choice for gas turbines – at elevated temperatures. Their results indicate that hydrogen-induced embrittlement can be at least twice as severe, posing a significant challenge for components that must meet the highest standards of safety and reliability. Researchers of the Max Planck Institute for Sustainable Materials (MPI SusMat) in Germany and their collaborators published new findings in the journal *Nature Materials*.

Why hydrogen trapping at elevated temperatures fails

“When hydrogen enters a Nickel-base superalloy at ambient temperatures, it is usually trapped at interfaces and dislocations. At elevated temperatures, hydrogen atoms migrate to carbon vacancies within carbides, causing their partial decomposition. Moreover, hydrogen and carbon atoms react and form methane. This highly pressurized methane exerts a high local internal pressure that weakens the interfaces, and promotes damage”, explains Dr Xizhen Dong, postdoctoral researcher at MPI SusMat and one of the first authors of the recent publication.



Dong and her colleagues tested how hydrogen affects Nickel-base superalloys in a temperature range from 400°C to 1000°C. By combining atom probe tomography and density functional theory calculations, the researchers were able to show that the degradation mechanisms in Nickel-base superalloys exposed to hydrogen fundamentally change depending on the operating temperatures. The degradation only takes place at 400°C, while no methane formation is seen above that. “What we discovered here is essential especially for gas turbines and flying turbines, which, unlike stationary steam turbines, are frequently switched on and off and therefore experience a larger temperature and load spectrum where embrittlement effects can occur”, explains Professor Dierk Raabe, director at MPI SusMat and one of the corresponding authors.

The research was led by scientists from the East China University of Science and Technology (China), Max Planck Institute for Sustainable Materials (Germany), and the Hunan University (China)

(Picture: MPI SusMat)

Designing hydrogen-resistant Nickel-base superalloys

Having shown that carbides are the entry gate for hydrogen-induced cracking, a future alloy design would aim to tailor the alloy's microstructure by replacing carbides. Since carbides are widely used to strengthen high-performance alloys, new strengthening strategies will be required. Alternatively, a balance has to be found between mechanical strength gained from carbides and hydrogen embrittlement resistance.

These findings underscore the need for temperature-specific mechanistic frameworks and predictive models to describe hydrogen-induced damage not only in Nickel-base superalloys, but also in other carbide-containing alloys, including steels and metal-ceramic composites and pave the way for future hydrogen-fuelled gas turbine energy and air traffic systems.

Max Planck Institute for Sustainable Materials

What we discovered here is essential especially for gas turbines and flying turbines, which, unlike stationary steam turbines, are frequently switched on and off.

Professor Dierk Raabe, director at MPI-SusMat, Düsseldorf, Germany

The next issue of STAHL + TECHNIK in German will be out in November covering the following topics:

STEEL TECHNOLOGY

In-line bulk material analysis – the potential and challenges of camera-based quality monitoring

Optical inline bulk material analysis extends existing inline measurement technology by enabling material properties to be measured continuously and non-contact, directly within the process. However, reliable industrial application requires not only high-performance image processing methods, but above all process integration tailored to the measurement task, as well as robust designs for long-term operation under real production conditions.

Electrification of thermal processes using high-performance heaters

Electric heaters in industrial furnaces qualify as an electrification measure. Hybrid furnace concepts that can switch between gas and electricity depending on the price of electricity offer a further advantage. If at least 80 per cent of the reinvestment is allocated to such flexibility measures, funding is available at a further ten per cent. Discussions with steel companies repeatedly reveal that this investment requirement is still largely unknown. Yet it fundamentally alters the cost-benefit analysis for electrification.

STEEL DISTRIBUTION

In the midst of regulatory uncertainty – the real driving forces behind the steel sector

New import and export regulations, increasing requirements, mounting cost pressures – the stainless steel industry is facing one of the most confusing market situations it has seen in years. However, what companies now expect from their suppliers is clearer than ever, explains Bernd Grotenburg, Managing Director of Cogne Edelstahl GmbH.

STEEL PROCESSING

High speed laser blanking live in operation

The BILCUT system was presented live in operation for the first time at an in-house exhibition in Germany in September 2026. In October, EMW and BILCUT will jointly present the technology to an international automotive trade audience at the International Suppliers Fair (IZB) in Wolfsburg. Series production is scheduled to start in early 2027.

Place your ad in the next issue before **13 October 2026**
Contact: Markus Winterhalter, Tel. +49 211 1591-142,
E-mail: markus.winterhalter@dvs-media.info

STEEL+ TECHNOLOGY

Publishing House

DVS Media GmbH
PO Box 10 19 65, 40010 Düsseldorf, Germany
Aachener Straße 172, 40223 Düsseldorf, Germany
Phone +49 211 1591-0
Fax +49 211 1591-200
E-mail media@dvs-media.info
www.dvs-media.eu · www.home-of-steel.de
Management: Arnd Winkelkemper

Editorial Team

Dipl.-Ing. Arnt Hannewald (responsible)
Phone +49 211 1591-232
E-mail arnt.hannewald@dvs-media.info
Lucas Möllers
Phone +49 211 1591-283
E-mail lucas.moellers@dvs-media.info

Advertising

Markus Winterhalter (responsible)
Phone +49 211 1591-142
E-mail markus.winterhalter@dvs-media.info

Samira El Allaoui
Phone +49 6139 29 34 42
Mobile +49 176 45 70 91 26
E-mail samira.elallaoui@dvs-media.info

Katrin Kuchler
Phone +49 211 1591-146
E-mail katrin.kuechler@dvs-media.info

Henning Schneider
Phone +49 211 1591-223
Mobile +49 151 74 41 46 57
E-mail henning.schneider@dvs-media.info

Claudia Wolff
Phone +49 211 1591-224
Mobile +49 173 66 32 808
E-mail claudia.wolff@dvs-media.info

For currently valid prices see Price List No. 2, effective January 1st 2023.

Reader Service

DVS Media GmbH
Phone +49 89 85853-847
Fax +49 89 85853-62847
E-mail aboservice@dvs-media.info

Production

Mike Reschke (responsible)
mike.reschke@dvs-media.info
Laura Sieben (graphic design)
laura.sieben@dvs-media.info

Printing

D + L Printpartner GmbH
Schlavenhorst 10
46395 Bocholt, Germany

STEEL + TECHNOLOGY is printed with the highest environmental standards.

Terms of Delivery

STEEL + TECHNOLOGY is published four times a year and is available on subscription. The price for a one-year subscription for print and e-paper is 69.00 € incl. shipment (VAT not included). Subscriptions will be renewed for the next 12 months, unless DVS Media GmbH receives a written cancellation 6 weeks prior expiration. VAT calculated in accordance with EC legislation. Single copy: 30.00 € excl. shipment

Copyright

STEEL + TECHNOLOGY as well as all contributions, figures and tables included in this journal are protected by copyright. With the exception of statutorily authorised cases, any utilisation without the consent of the DVS Media GmbH is punishable. We do not accept any liability for manuscripts submitted without solicitation.

ISSN (Print) 2628-3859

ISSN (Online) 2628-3867

STEEL SUPPLIERS INTERNATIONAL

SUPPLIER FOR THE INTERNATIONAL STEEL INDUSTRY FROM A TO Z

01	Raw materials, auxiliary materials and operating materials	16	Furnace and energy technology
02	Raw material pretreatment	17	Refractory technology
03	Iron making	18	Machinery and plant engineering
04	Steelmaking	19	Transport and storage technique
05	Continuous casting	20	Electrical engineering and automation
06	Near net shape casting	21	Measuring and testing technique
07	Hot rolling	22	Materials testing
08	Forging, extrusion	23	Analysis and laboratory equipment
09	Powder metallurgy	24	Environmental protection and disposal
10	Cold rolling	25	Occupational safety and ergonomics
11	Surface treatment	26	Other products
12	Production of bright steel and wire	27	Consulting, planning and services
13	Production of tubes/pipes	28	Steel in civil engineering
14	Sheet metal processing	30	Service concerning steel materials
15	Steel products		

WELCOME TO

STEEL SUPPLIERS INTERNATIONAL

THE INTERNATIONAL

STEEL INDUSTRY FROM A TO Z



CHOOSE SUCCESS! INTERESTED?

Then get in touch with Katrin Küchler.

Tel. +49 211 1591-146 · steelsuppliers@dvs-media.info



THE WHOLE WORLD OF MANUFACTURERS AND SUPPLIERS AT A GLANCE!



PRICING EXAMPLE:

1 to 5 Keywords = 250 each

6 to 10 Keywords = 230 each

11 and more Keywords = 220 each

in following STEEL+TECHNOLOGY issues:

1/2027

2/2027

3+4/2027

EUR 225 only * (* ex VAT)

02 Raw material pretreatment**02.01 Ore dressing****740 Mixers/core sand mixers**

**Maschinenfabrik
Gustav Eirich GmbH & Co KG**
Walldürner Str. 50
74736 Hardheim, Germany
☎ +49 6283 51-0
☎ +49 6283 51-325
E-Mail: eirich@eirich.de
Internet: www.eirich.de

03 Iron making**03.01 Blast furnaces****1150 Heat recovery systems**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

03.02 Direct reduction plants**1160 Direct reduction plants**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04 Steelmaking**1668 Equipment for steelmaking plants**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

04.04 Electric steel plant**1875 Electric arc ladle furnaces**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.07 Secondary metallurgy**2028 Equipment for chemical heating**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2030 Argon purging equipment

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.07 Secondary metallurgy**2080 Ladle metallurgical plants**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2110 Secondary metallurgical plants

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2120 Steel degassing plants



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2130 Steel desulfurization plants



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2140 T+P lance equipment



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.09 Components

2182 Burning lances (oxygen) for tundish and ladle gate valves



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2270 Injection plants for argon



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

04.09 Components

2440 Handling equipment for oxygen/carbon lances



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

04.09 Components

2490 Coal dust injection lances



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2530 Lance robots/-manipulators



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2580 Oxygen nozzles



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.09 Components**2600 Oxygen lance equipment**

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2655 Fuses (multifunction) for burners

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2660 Special safety oxygen hose reels

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

07 Hot rolling**07.10 Components****4430 Decoilers and rewinders**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

08 Forging, extrusion**08.03 Components****5150 Forging manipulators**

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5155 Forging manipulators, rail-mounted

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5160 Forging robots

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

10 Cold rolling**10.04 Annealing lines****5670 Annealing lines**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

11 Surface treatment**11.05 Aluminizing, tin plating, galvanizing****6630 Hot dip galvanizing lines**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

14 Sheet metal processing**14.03 Welding technology****8120 Strip welding machines**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

14.03 Welding technology**8205 Laser welding machines**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8210 Laser beam welding machines

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8220 MIG, MAG and TIG\057TIG welding torches

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8257 Rolling seam resistance welding equipment

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

14.03 Welding technology**8330 Welding machines, general**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8360 Welding accessories, general

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8380 Buttwelding machines, electric

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8400 Resistance welding equipment

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

16 Furnace and energy technology**10170 Furnace optimization (conversion to low NOx combustion)**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com



WS Wärmeprozessstechnik GmbH
Dornierstr. 14
71272 Renningen, Germany
☎ +49 7159 1632-0
☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

10190 Rational use of energy



WS Wärmeprozessstechnik GmbH
Dornierstr. 14
71272 Renningen, Germany
☎ +49 7159 1632-0
☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

16.02 Forging furnaces

10230 Forging furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.03 Roller Hearth Continuous Furnaces

10260 Roller Hearth Continuous Furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10270 Roller hearth and walking beam furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.05 Top-hat furnaces

10310 Top-hat furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.08 Heating furnaces and heat treatment plants

10408 Continuous furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10410 Co-step furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10430 Bogie hearth furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10460 Chamber furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.08 Heating furnaces and heat treatment plants

10510 Roller hearth and walking beam furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10540 Pusher-type, roller and rotary hearth furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10560 Heat treatment plants



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

10562 Heat treatment furnaces (continuous and discontinuous)



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

10570 Heat treatment furnaces for batch operation, open heated



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

16.09 Bath furnaces

10580 Aluminum melting furnaces



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

16.13 Components

10890 Natural gas burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

11010 Regenerative burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

11020 Recuperative burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

16.13 Components

11070 Radiant tube burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

17 Refractory technology

17.03 Refractory materials and equipment

11481 Fiber ceramic moldings, vacuum formed, up to 1750 °C



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

11485 Fiber mats and felts up to 1600 °C



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

17.03 Refractory materials and equipment

11510 Refractory concrete



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

11580 Lightweight refractory and insulating bricks

RATH

OUTSTANDING INSIDE
Refractory Solutions®

RATH AG

Walfischgasse 14
1010 Wien, Austria
☎ +43 1 5134427- 0
☎ +43 1 5134427-2186
E-Mail: info@rath-group.com
Internet: www.rath-group.com

17.03 Refractory materials and equipment

11960 High-alumina bricks (andalusite, bauxite, corundum, mullite, sillimanite bricks)

RATH

OUTSTANDING INSIDE
Refractory Solutions®

RATH AG

Walfischgasse 14
1010 Wien, Austria
☎ +43 1 5134427- 0
☎ +43 1 5134427-2186
E-Mail: info@rath-group.com
Internet: www.rath-group.com

18 Machinery and plant engineering

12210 Plant engineering, general

tenova
LOI THERMPROCESS

LOI Thermprocess GmbH

Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

18.06 Ventilation plants and equipment

12660 Air conditioners for heat plants

FRIGORTEC
Cooling to the point

FrigorTec GmbH

Hummelau 1
88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

12670 Air conditioners for crane lances, crane bridges, etc.

FRIGORTEC
Cooling to the point

FrigorTec GmbH

Hummelau 1
88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

18.10 Power and work machines

13070 Piston pumps

HYDROWATT
high pressure pumps

HYDROWATT AG

Freistrasse 2
8200 Schaffhausen, Switzerland
☎ +41 52 624 53 22
E-Mail: info@hydrowatt.com
Internet: www.hydrowatt.com

18.10 Power and work machines

13160 Vacuum pumps

tenova
LOI THERMPROCESS

LOI Thermprocess GmbH

Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

21 Measuring and testing technique

21.02 Measurement of physical properties

16608 Strip thickness control (AGC)

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16652 Dressing degree and mass flow measuring systems

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16830 Speed measuring devices

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16910 Length measuring devices for tubes



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

16950 Length and speed measuring systems (optical)



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

16960 Laser speed and length measuring systems



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

24 Environmental protection and disposal

24.01 Dedusting and gas cleaning

18360 Exhaust gas cooling systems



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

18400 Treatment of dusts from steel mills and foundries



**Maschinenfabrik
Gustav Eirich GmbH & Co KG**
Walldürmer Str. 50
74736 Hardheim, Germany
☎ +49 6283 51-0
☎ +49 6283 51-325
E-Mail: eirich@eirich.de
Internet: www.eirich.de

02 Raw material pretreatment**02.01 Ore dressing****740 Mixers/core sand mixers**

**Maschinenfabrik
Gustav Eirich GmbH & Co KG**
Walldürner Str. 50
74736 Hardheim, Germany
☎ +49 6283 51-0
☎ +49 6283 51-325
E-Mail: eirich@eirich.de
Internet: www.eirich.de

03 Iron making**03.01 Blast furnaces****1150 Heat recovery systems**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

03.02 Direct reduction plants**1160 Direct reduction plants**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04 Steelmaking**1668 Equipment for steelmaking plants**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

04.04 Electric steel plant**1875 Electric arc ladle furnaces**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.07 Secondary metallurgy**2028 Equipment for chemical heating**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2030 Argon purging equipment

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.07 Secondary metallurgy**2080 Ladle metallurgical plants**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2110 Secondary metallurgical plants

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2120 Steel degassing plants



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2130 Steel desulfurization plants



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

2140 T+P lance equipment



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.09 Components

2182 Burning lances (oxygen) for tundish and ladle gate valves



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2270 Injection plants for argon



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

04.09 Components

2440 Handling equipment for oxygen/carbon lances



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

04.09 Components

2490 Coal dust injection lances



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2530 Lance robots/-manipulators



BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2580 Oxygen nozzles



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

04.09 Components**2600 Oxygen lance equipment**

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2655 Fuses (multifunction) for burners

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

2660 Special safety oxygen hose reels

BEDA-Oxygentechnik GmbH
An der Pönt 59
40885 Ratingen, Germany
☎ +49 2102 9109-0
E-Mail: info@BEDA-com
Internet: www.BEDA.com

07 Hot rolling**07.10 Components****4430 Decoilers and rewinders**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

08 Forging, extrusion**08.03 Components****5150 Forging manipulators**

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5155 Forging manipulators, rail-mounted

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

5160 Forging robots

Glama Maschinenbau GmbH
Hornstr. 19
45964 Gladbeck, Germany
☎ +49 2043 9738-0
☎ +49 2043 47268
Internet: www.glama.de

10 Cold rolling**10.04 Annealing lines****5670 Annealing lines**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

11 Surface treatment**11.05 Aluminizing, tin plating, galvanizing****6630 Hot dip galvanizing lines**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

14 Sheet metal processing**14.03 Welding technology****8120 Strip welding machines**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

14.03 Welding technology**8205 Laser welding machines**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8210 Laser beam welding machines

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8220 MIG, MAG and TIG\057TIG welding torches

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8257 Rolling seam resistance welding equipment

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

14.03 Welding technology**8330 Welding machines, general**

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8360 Welding accessories, general

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8380 Butt welding machines, electric

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

8400 Resistance welding equipment

GUILD International
7273 Division Street
Bedford, OH 44146, USA
☎ +1 440-232-5887
E-Mail: sales@guildint.com

16 Furnace and energy technology**10170 Furnace optimization (conversion to low NOx combustion)**

LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com



WS Wärmeprozessstechnik GmbH
Dornierstr. 14
71272 Renningen, Germany
☎ +49 7159 1632-0
☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

10190 Rational use of energy



WS Wärmeprozessstechnik GmbH
Dornierstr. 14
71272 Renningen, Germany
☎ +49 7159 1632-0
☎ +49 7159 2738
E-Mail: ws@flox.com
Internet: www.flox.com

16.02 Forging furnaces

10230 Forging furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.03 Roller Hearth Continuous Furnaces

10260 Roller Hearth Continuous Furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10270 Roller hearth and walking beam furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.05 Top-hat furnaces

10310 Top-hat furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.08 Heating furnaces and heat treatment plants

10408 Continuous furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10410 Co-step furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10430 Bogie hearth furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10460 Chamber furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

16.08 Heating furnaces and heat treatment plants

10510 Roller hearth and walking beam furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10540 Pusher-type, roller and rotary hearth furnaces



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

10560 Heat treatment plants



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

10562 Heat treatment furnaces (continuous and discontinuous)



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

10570 Heat treatment furnaces for batch operation, open heated



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

16.09 Bath furnaces

10580 Aluminum melting furnaces



LOI Thermprocess GmbH
 Schifferstraße 80
 47059 Duisburg, Germany
 ☎ +49 203 80398-900
 📠 +49 203 80398-901
 E-Mail: loi@tenova.com
 Internet: www.loi.tenova.com

16.13 Components

10890 Natural gas burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

11010 Regenerative burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

11020 Recuperative burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

16.13 Components

11070 Radiant tube burners



WS Wärmeprozessstechnik GmbH
 Dornierstr. 14
 71272 Renningen, Germany
 ☎ +49 7159 1632-0
 📠 +49 7159 2738
 E-Mail: ws@flox.com
 Internet: www.flox.com

17 Refractory technology

17.03 Refractory materials and equipment

11481 Fiber ceramic moldings, vacuum formed, up to 1750 °C



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

11485 Fiber mats and felts up to 1600 °C



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

17.03 Refractory materials and equipment

11510 Refractory concrete



OUTSTANDING INSIDE
 Refractory Solutions®

RATH AG
 Walfischgasse 14
 1010 Wien, Austria
 ☎ +43 1 5134427- 0
 📠 +43 1 5134427-2186
 E-Mail: info@rath-group.com
 Internet: www.rath-group.com

11580 Lightweight refractory and insulating bricks

RATH

OUTSTANDING INSIDE
Refractory Solutions®

RATH AG

Walfischgasse 14
1010 Wien, Austria
☎ +43 1 5134427-0
☎ +43 1 5134427-2186
E-Mail: info@rath-group.com
Internet: www.rath-group.com

17.03 Refractory materials and equipment

11960 High-alumina bricks (andalusite, bauxite, corundum, mullite, sillimanite bricks)

RATH

OUTSTANDING INSIDE
Refractory Solutions®

RATH AG

Walfischgasse 14
1010 Wien, Austria
☎ +43 1 5134427-0
☎ +43 1 5134427-2186
E-Mail: info@rath-group.com
Internet: www.rath-group.com

18 Machinery and plant engineering

12210 Plant engineering, general

tenova
LOI THERMPROCESS

LOI Thermprocess GmbH

Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

18.06 Ventilation plants and equipment

12660 Air conditioners for heat plants

FRIGORTEC
Cooling to the point

FrigorTec GmbH

Hummelau 1
88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

12670 Air conditioners for crane lances, crane bridges, etc.

FRIGORTEC
Cooling to the point

FrigorTec GmbH

Hummelau 1
88279 Amtzell, Germany
☎ +49 7520 914820
E-Mail: info@frigortec.com
Internet: www.frigortec.com

18.10 Power and work machines

13070 Piston pumps

HYDROWATT
high pressure pumps

HYDROWATT AG

Freistrasse 2
8200 Schaffhausen, Switzerland
☎ +41 52 624 53 22
E-Mail: info@hydrowatt.com
Internet: www.hydrowatt.com

18.10 Power and work machines

13160 Vacuum pumps

tenova
LOI THERMPROCESS

LOI Thermprocess GmbH

Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

21 Measuring and testing technique

21.02 Measurement of physical properties

16608 Strip thickness control (AGC)

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16652 Dressing degree and mass flow measuring systems

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16830 Speed measuring devices

Polytec

POLYTEC GmbH

Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

21.02 Measurement of physical properties

16910 Length measuring devices for tubes



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

16950 Length and speed measuring systems (optical)



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

16960 Laser speed and length measuring systems



POLYTEC GmbH
Polytec-Platz 1-7
76337 Waldbronn, Germany
☎ +49 7243 604-0
☎ +49 7243 69944
E-Mail: info@polytec.de
Internet: www.polytec.de

24 Environmental protection and disposal

24.01 Dedusting and gas cleaning

18360 Exhaust gas cooling systems



LOI Thermprocess GmbH
Schifferstraße 80
47059 Duisburg, Germany
☎ +49 203 80398-900
☎ +49 203 80398-901
E-Mail: loi@tenova.com
Internet: www.loi.tenova.com

18400 Treatment of dusts from steel mills and foundries



**Maschinenfabrik
Gustav Eirich GmbH & Co KG**
Walldürmer Str. 50
74736 Hardheim, Germany
☎ +49 6283 51-0
☎ +49 6283 51-325
E-Mail: eirich@eirich.de
Internet: www.eirich.de

STEEL SUPPLIERS INTERNATIONAL

PRODUCT LIST OF
THE INTERNATIONAL
STEEL INDUSTRY FROM A TO Z –
SCAN HERE:



FOR SALE

second-hand – state of the art

SMS MEER
pipe and section plant
Ø max. 150 x 5,5 mm

CARTACCI
tube straightener 7 V 0
Ø max. 50 x 6 mm

BRONX/MAIR
tube finishing shop
Ø max. 150 x 5 mm

COILTEC
Maschinenvertriebs GmbH
www.coiltec.de
info@coiltec.de



We are exhibitor

HÜTTENTAG



**WE ARE MORE THAN JUST RED!
TECHNOLOGY WITHOUT COMPROMISE**



**METEC INDIA
HALL 3
BOOTH E92**



STEIN
INJECTION TECHNOLOGY GmbH