

BALLUFF

B *innovating automation*

Steel and
Metallurgical
Industry

**RELIABILITY
AND FLEXIBILITY FROM
A SINGLE SOURCE**

Balluff in the steel and metallurgical industry

WE ARE AT HOME IN MANY DIFFERENT SECTORS

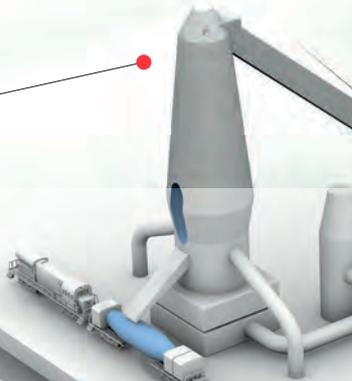




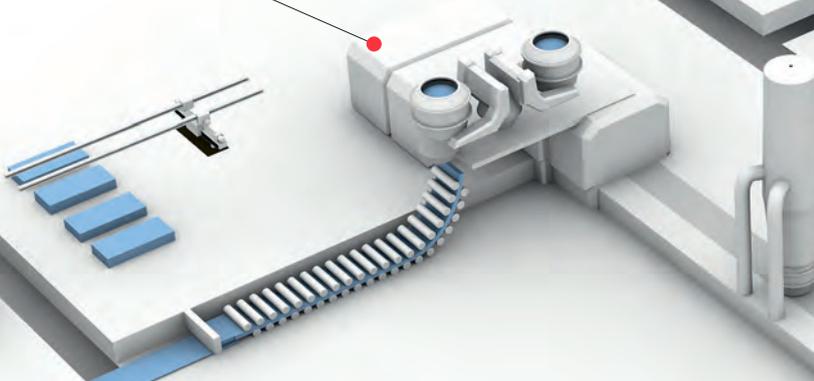
Balluff in the steel and metallurgical industry

TECHNOLOGY EXPERTISE FOR THE ENTIRE VALUE CREATION CHAIN

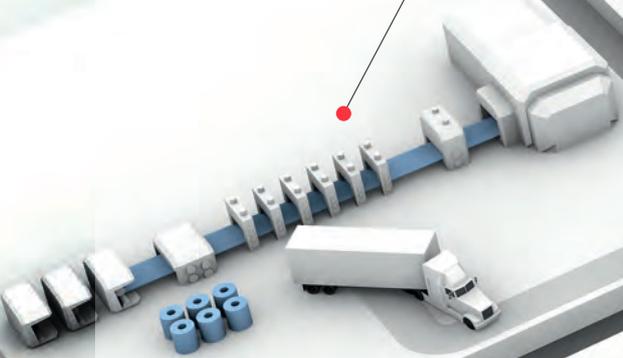
BLAST FURNACE



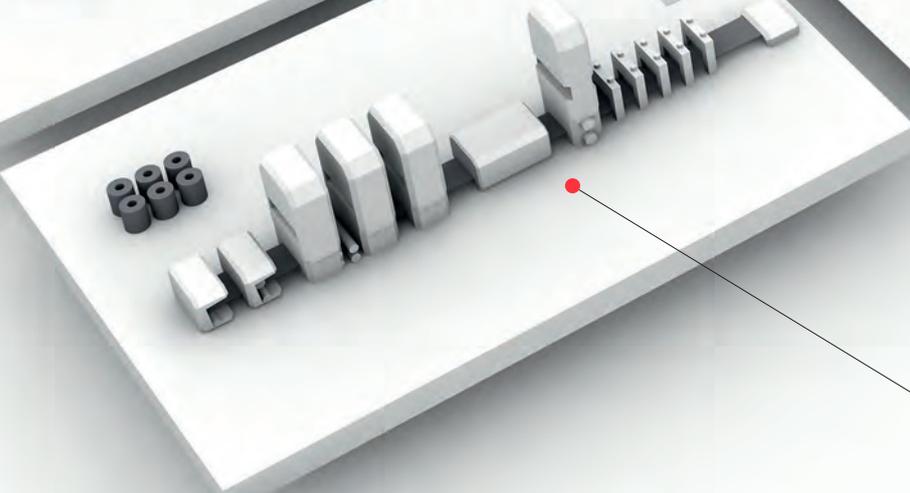
CONTINUOUS CASTING LINE

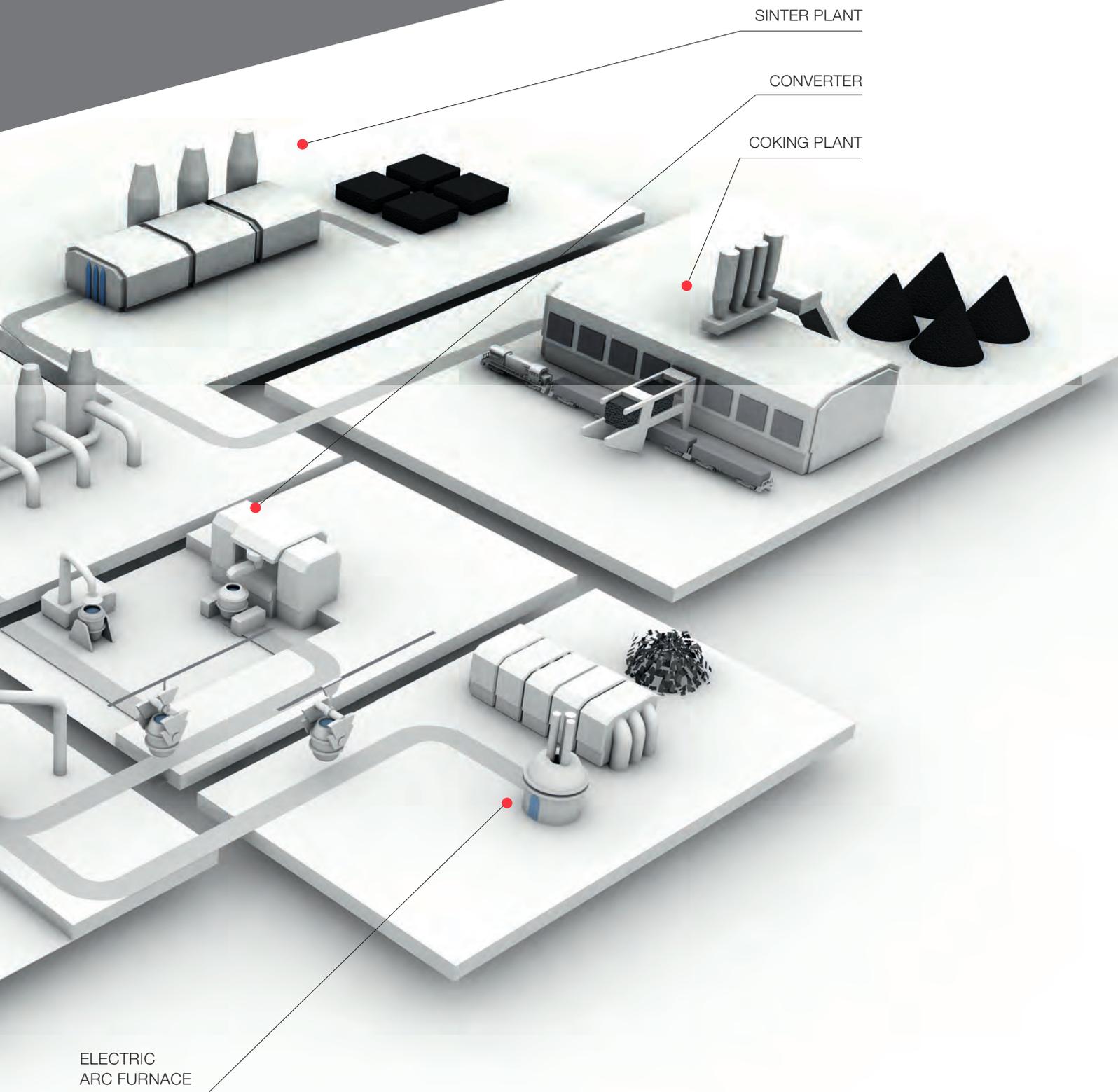


HOT ROLLING AND
HEAVY PLATE PRODUCTION



COLD ROLLING AND
SURFACE FINISHING





SINTER PLANT

CONVERTER

COKING PLANT

ELECTRIC
ARC FURNACE

Whether in the automobile industry, aviation and aerospace, energy production, construction or medical technology – steel plays a key role everywhere. It is extremely adaptable and meets the highest requirements. Its consistent quality when it comes to corrosion protection, low weight or great ductility ensures the success of complex processes and enables repeatability even under the harshest conditions.

Linking optimal quality management with efficient and reliable processes requires equipment and machines of the highest quality. Preferable equipped with first-class sensors and systems as well as the appropriate network technology from Balluff. High-temperature, shock and vibration proof, extremely rugged and reliable, our technologies especially developed for harsh environments, ensure maximum equipment up-time and machine performance in every phase.



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COKE OVEN BATTERIES AND
CONVEYING EQUIPMENT**



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**BLAST FURNACE AND
ELECTRIC ARC FURNACE**



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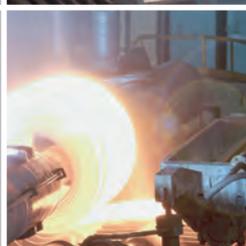
CONTINUOUS CASTING LINE



Maximum flexibility for various formats

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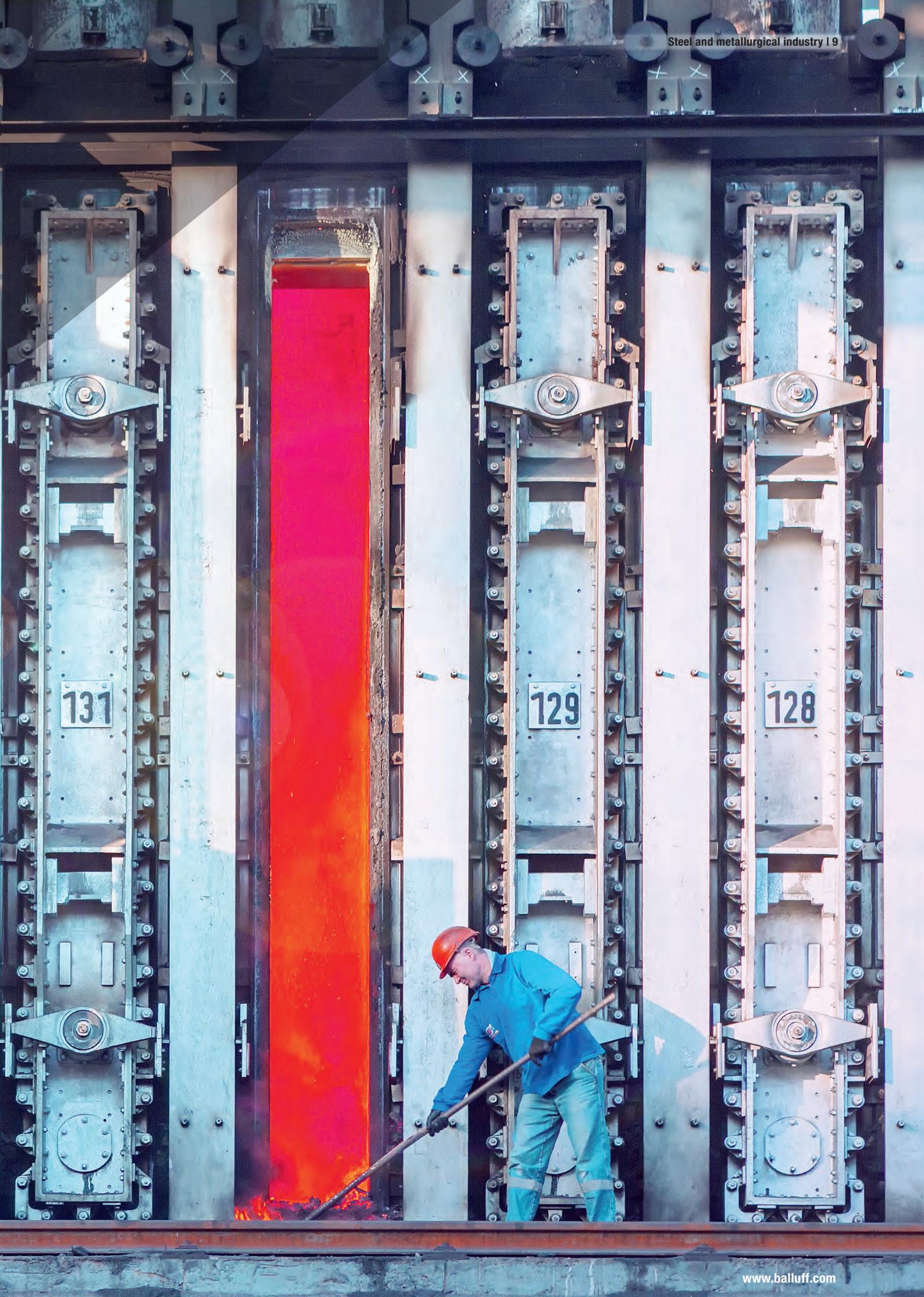
Coking machines, coke oven batteries and conveying equipment

GET OFF TO THE OPTIMAL START IN STEEL PRODUCTION.

B *innovating automation*

No ifs or buts: the highest priority in a steel plant is an uninterrupted process. Meet these high requirements from the very start. Balluff provides you with highly reliable solutions for a wide variety of tasks pertaining to coking plant machines, the coke oven battery and conveying equipment.

Just where things get really hot is where our rugged BTL magnetostrictive linear position sensor will get the job done at up to 100 °C. It reliably controls all movements during oven charging in the coking plant. The oven controller is monitored by an EX protected position measuring system which is perfectly designed for the gas environment. And for tracking the relative positions of larry cars, pusher cars, and transfer cars at the coke oven battery, we offer our Industrial RFID, which boasts a large read/write distance, fast data transmission, high data integrity, and operates without line-of-sight contact.



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Solutions for coking machines, coke oven batteries and conveying equipment

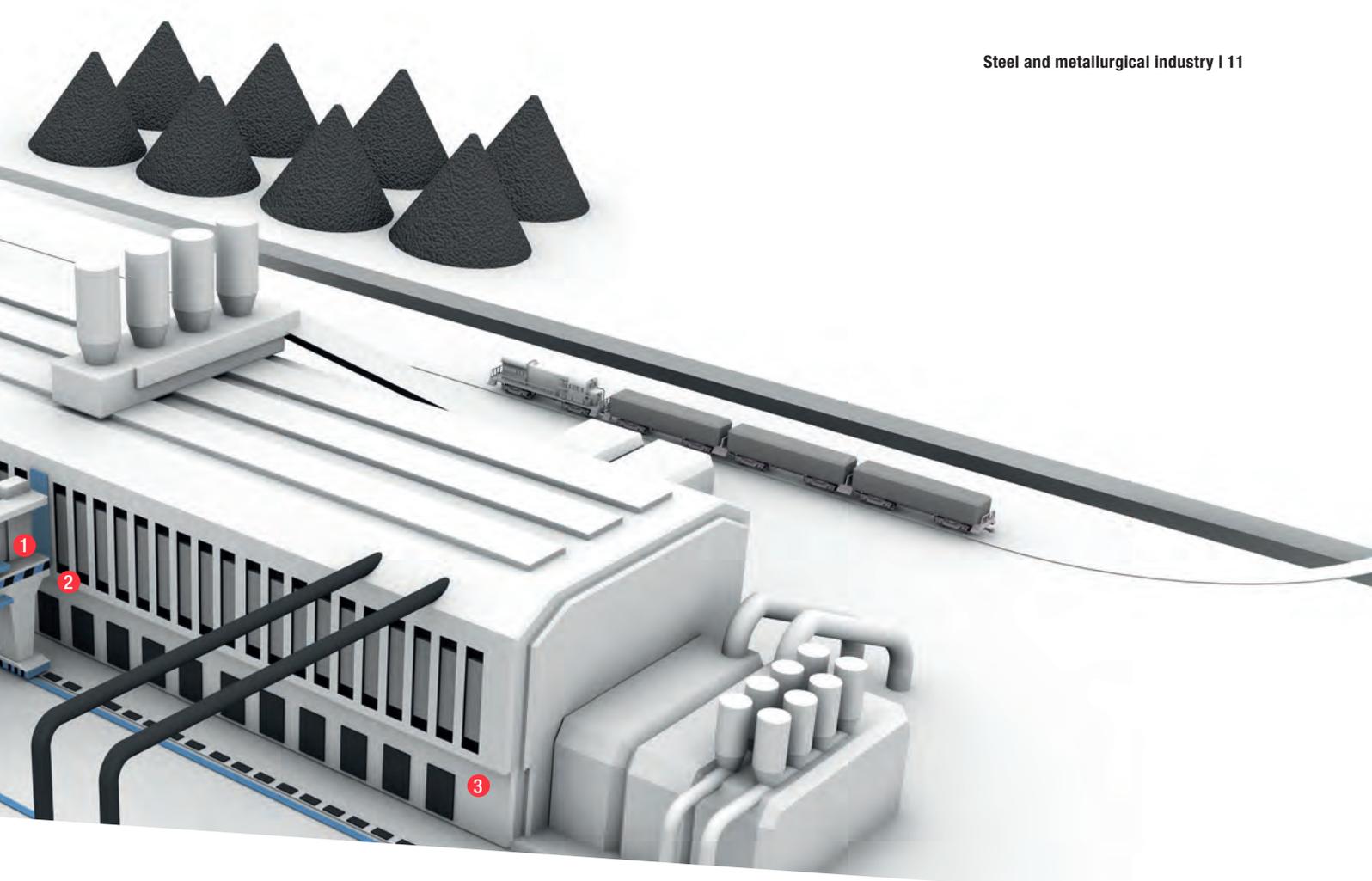


POSITION DETECTION AT THE PUSHER MACHINE With BES inductive sensors

Optimize the availability of your systems, reduce maintenance costs and increase the quality of your processes. Whether it's position sensing or end-of-travel detection on the pusher machine, our BES high-temperature rated inductive sensors ensure the best results in the hot zone up to 160 °C.

Features

- Protection rating IP69K
- Functional security, even in continuous operation
- No additional evaluation electronics needed

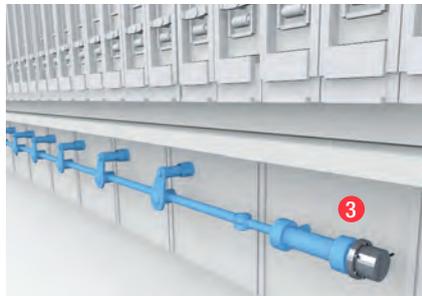


COKE OVEN BATTERY CONTROL
With BTL magnetostrictive sensors

Regulating the oven control system under extreme conditions makes strict safety measures necessary. Here you can rely on a transducer which has been approved for hazardous areas. The BTL magnetostrictive linear position sensor with explosion protection is optimally implemented if a gas environment requires high reliability – for example when regulating the oven control system.

Features

- Contact-free measurement system
- For measuring ranges between 25 and 7620 mm
- Available in various versions for equipment in Europe and around the world



FOR ALL MOVEMENTS AT THE COKE OVEN BATTERY
With BTL magnetostrictive sensors

Would you like to enjoy the benefits of non-contact travel measurement even in high ambient temperatures? Then we recommend our BTL magnetostrictive linear position sensor rated for up to 100 °C. From its protected position in the hydraulic cylinder, it controls all movements at the coke oven battery.

Features

- Rugged metal housing with IP67
- Can be equipped with PTFE cable up to 200 °C



CONTROL THE PUSHER CARS
With BIS industrial RFID systems

At the coke oven battery, industrial RFID systems from Balluff enable data exchange in real time to ensure correct and fully autonomous positioning of the larry, pusher and transfer cars. Any number of write-enabled data carriers are embedded in the floor and are read out via a read/write device without a direct line of sight.

Features

- Data exchange in real time
- Readout of the data carriers, even from a long distance
- Contact-free and therefore wear-free

Blast furnace and electric arc furnace

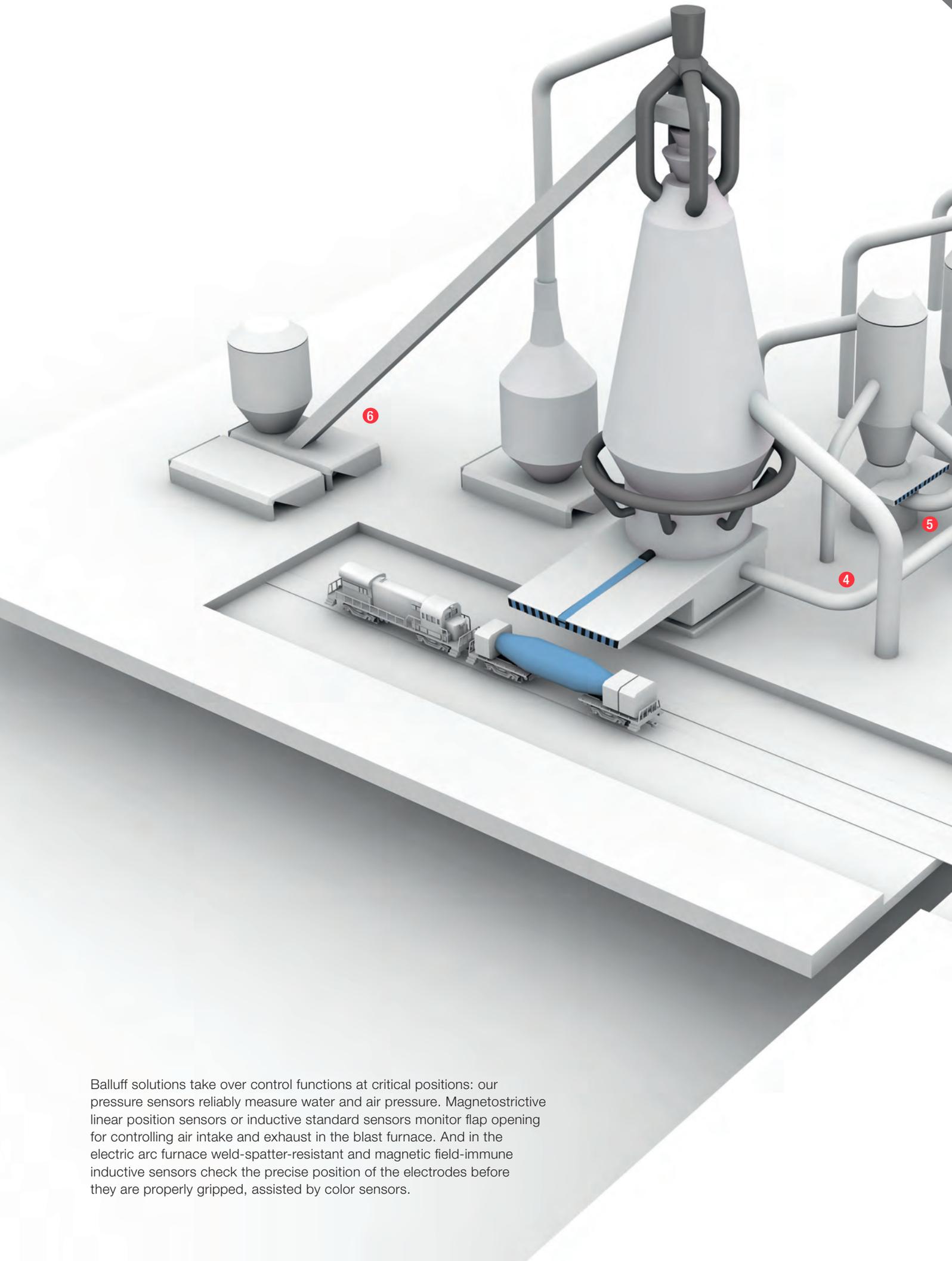
CONTINUOUSLY MANAGE MAGNETIC FIELDS AND HIGH TEMPERATURES.

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At no other place in the steel mill is process reliability as important as at the blast and arc furnaces. For once it is commissioned, a blast furnace is used around the clock over the course of years – hardly possible without continuous water cooling and replenishment.

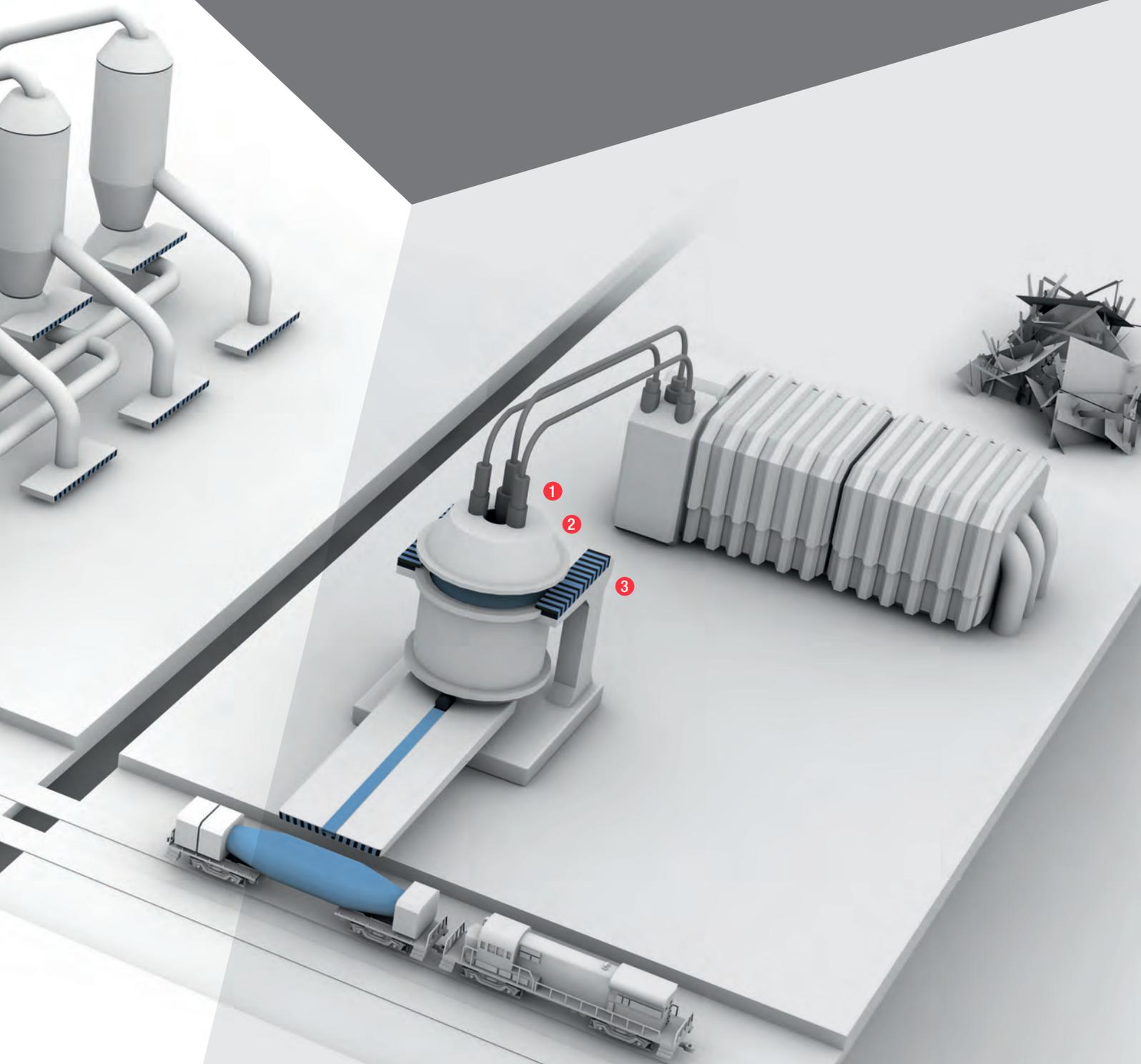
And just as critical to the process: absolutely reliable immunity to magnetic fields, safe inflow and outflow of gas when producing pig iron in the blast furnace, exact positioning of the electrodes in the arc furnace as well as controlling the conveying equipment. These are reasons enough to focus on every single detail.





Balluff solutions take over control functions at critical positions: our pressure sensors reliably measure water and air pressure. Magnetostrictive linear position sensors or inductive standard sensors monitor flap opening for controlling air intake and exhaust in the blast furnace. And in the electric arc furnace weld-spatter-resistant and magnetic field-immune inductive sensors check the precise position of the electrodes before they are properly gripped, assisted by color sensors.

Solutions for blast furnace and electric arc furnace



- 1 Electrode monitoring in the electric arc furnace
- 2 Assuring the correct electrode position
- 3 Measuring the inclination of the casting ladle
- 4 Pressure measurement for water cooling
- 5 Reliably regulating air and gas supply at the blast furnace
- 6 Level monitoring of charges and coke



**ELECTRODE MONITORING
IN THE ELECTRIC ARC FURNACE
With BKT contrast sensors**

Sensors for detecting color and contrast support the positioning of electrodes in the arc furnace. The sensor, which is protected in the gripper, checks whether it has been gripped correctly using color markings on the electrode – with absolute reliability and at various temperatures.

Features

- Software allows for simple configuration and visualization
- Any number of colors, even the slightest shades, can be detected and differentiated even with changing object temperature
- Rugged metal housing



**ASSURING THE CORRECT
ELECTRODE POSITION
With BES inductive sensors**

Increase process quality through reliable position detection. Our BES inductive sensors stand out especially in the harsh surroundings of the steel industry. Weld field immune and insensitive to magnetic fields, they are extremely reliable in ensuring the correct electrode position at the arc furnace.

Features

- Contact-free and therefore wear-free
- Available in Ø 3 mm to 80 x 80 mm square dimensions



**MEASURING THE INCLINATION
OF THE CASTING LADLE
With BSI inclination sensors**

Inclination sensors from Balluff with their extremely high accuracy of 0.1° offer the safety steelworkers need. They ensure precise location control of the cover or the casting ladle and continually guide the ladle as the pour is made. Their outstanding resolution provides extremely exact angle measurement even when rotational movement is involved.

Features

- High repeat accuracy and precision
- Rugged, compact metal housing
- Simple installation, no moving parts



**PRESSURE MEASUREMENT
FOR WATER COOLING
With BSP pressure sensors**

Sensors with extremely low drift, such as the BSP pressure sensors from Balluff, ensure efficient water cooling. They are ideal for use in the steel plant, where they ensure a long, stable pressure measurement process on blast and electric arc furnaces.

Features

- Protection class IP67
- Reliably monitor cooling water at the rolling stand or pressure at hydraulic drives at $-2\dots125\text{ °C}$



**RELIABLY REGULATING AIR AND
GAS SUPPLY AT THE BLAST FURNACE
With BTL magnetostrictive sensors**

Optimize your processes in pig iron production. And for valve and flap control on the blast furnace, use BES inductive standard sensors or BTL magnetostrictive linear position sensors. These help you to regulate the intake and exhaust air. All BTL sensors with a bus interface have temperature measurement integrated into the electronics head for displaying a possible overheating of the measuring system.

Features

- Intake and exhaust air is reliably regulated
- Additional security: the temperature of the measuring system is monitored



**LEVEL MONITORING
OF CHARGES AND COKE
With BUS ultrasonic sensors**

Extremely reliable and precise under extreme conditions: this is how BUS ultrasonic sensors from Balluff do their job. This makes them perfect for controlling the stack heights on conveyor belts as well as levels in silos. Unaffected by the harsh conditions in a steel plant, they detect objects made of many different materials and ensure you of reliable blast furnace charges even around the dust and dirt from burden material and coke.

Features

- Contactless detection
- Irrespective of color, transparency, reflection properties and surface finish on the object

Continuous casting line

MAXIMUM FLEXIBILITY FOR VARIOUS FORMATS

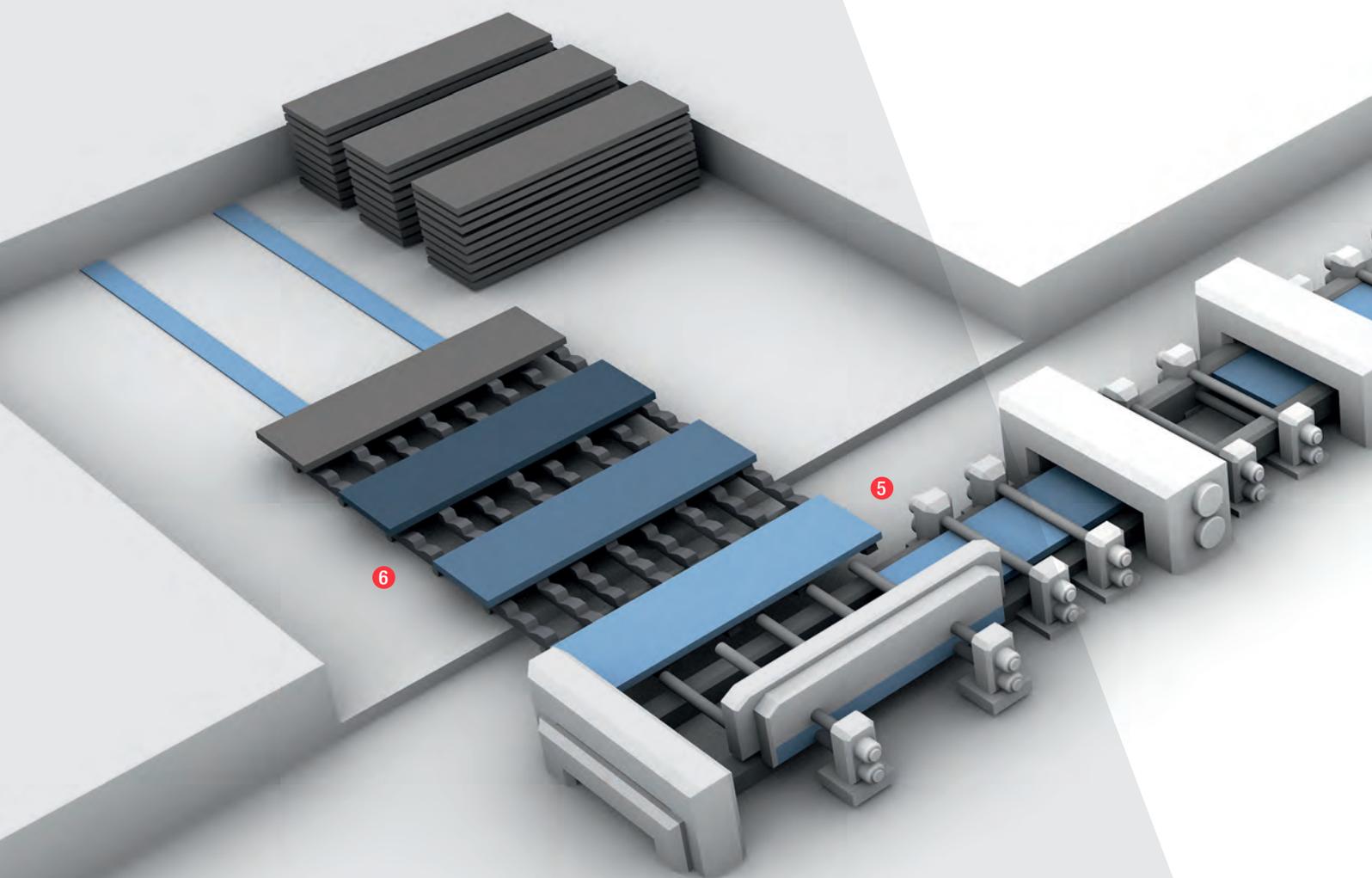
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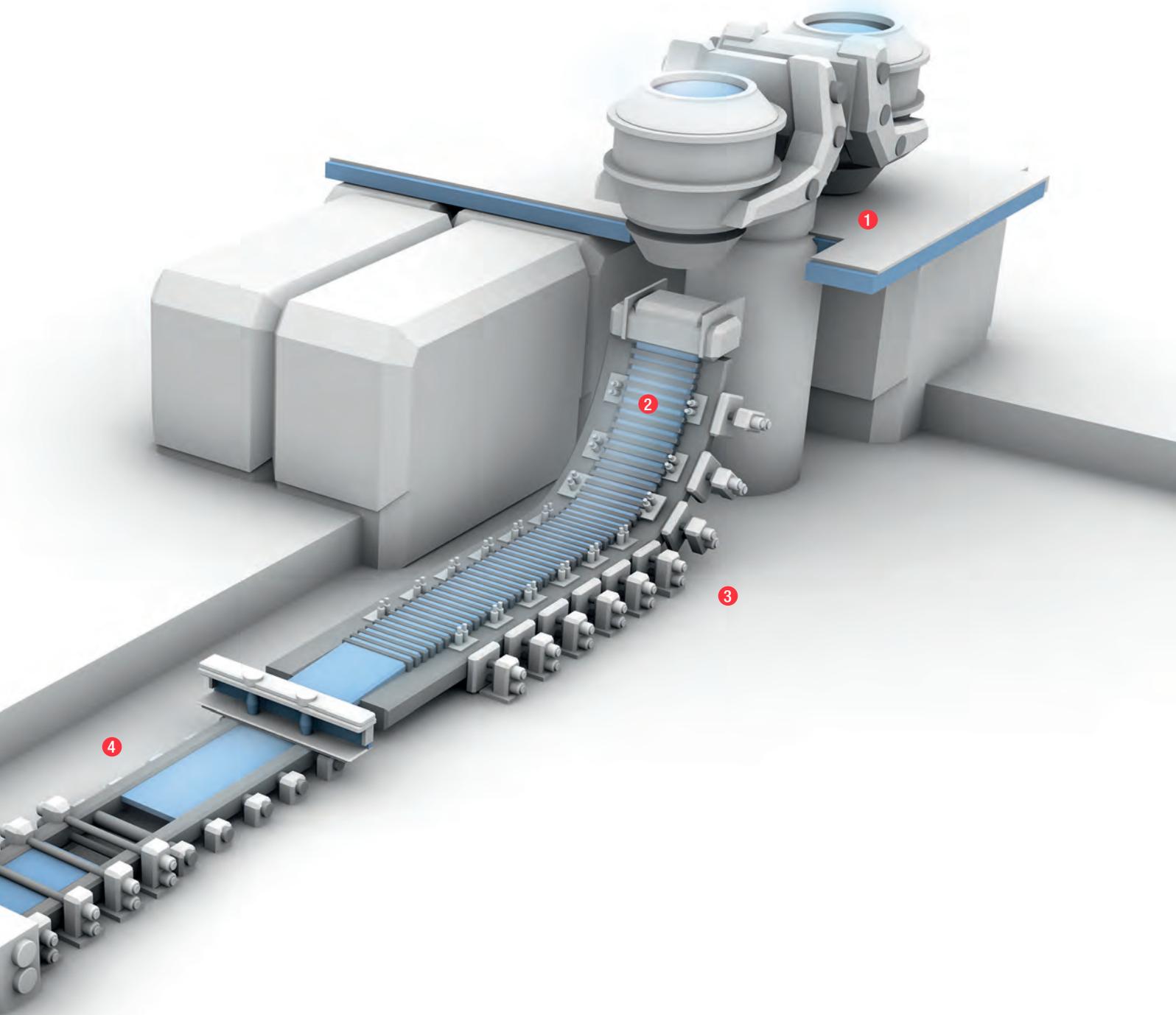
As efficiency increases, so do the demands on continuous casting lines. Large forces, vibrations and shock have to be controlled in the continuous casting line: at the ingot mold movement for the homogeneity of the fluid metal or at the walking-beam for transport of slabs or billets. Comprehensive monitoring measures are, therefore, indispensable.

But the investment pays off, because only in this way can you prevent costly pouring interruptions before they happen, improve the quality of the product, and increase your offering variety.



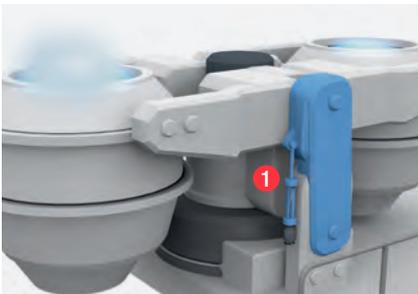
Solutions for the continuous casting line





- ① Highest safety for casting ladle control
- ② Position sensing at the dummy bar
- ③ Fast sensor replacement without leaks
- ④ Additional sensor protection when the system is stopped
- ⑤ Checking slab length
- ⑥ Slabs transport on the walking beam

The steel quality is determined at the continuous casting segments. The desired properties are achieved depending on the gradient, temperature and time of the reshaping. Therefore, maximum flexibility and peak reliability are required for the technology. Balluff sensors and systems provide you with security and guarantee a continuous process for a wide variety of product formats. Thanks to automatic format changing, every new customer requirement can be responded to in no time.



HIGHEST SAFETY FOR
CASTING LADLE CONTROL
With BTL magnetostrictive sensors

The casting ladle movement requires peak reliability. And for safety reasons, all of this argues for multiple redundancy of the systems used there. Multiple redundant BTL magnetostrictive linear position sensors provide up to three independent measuring systems in one housing to meet all the requirements for safe operation of your continuous casting line.

Features

- Two or three times redundant
- Various interfaces are possible
- Protection class IP67

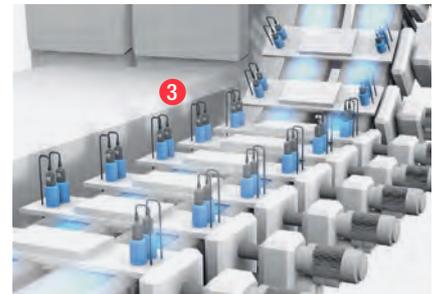


POSITION SENSING
AT THE DUMMY BAR
With BMF magnetic field sensors

Regulate your processes reliably from the very beginning. Our BMF magnetic field sensors help you, among other things, in regulating the process start and give you the security that the position for the sprue on the casting line has been detected precisely and reliably.

Features

- More reliable than optical sensors since it withstands higher temperatures (up to +85 °C)
- More flexible than inductive sensors since it can be installed with a greater switching distance



FAST SENSOR REPLACEMENT
WITHOUT LEAKS
With BTL magnetostrictive sensors

The Balluff Rapid Replacement Module allows you to quickly and easily replace BTL magnetostrictive linear position sensors in hydraulic cylinders. Since the complete sensor unit is replaced together with the integral waveguide, the hydraulic circuit remains closed. This minimizes the risk of leaks and prevents dirt from entering the hydraulic system.

Features

- Dimensions are identical to those of the standard rod position measurement system
- For analog, SSI and DP/IP interfaces

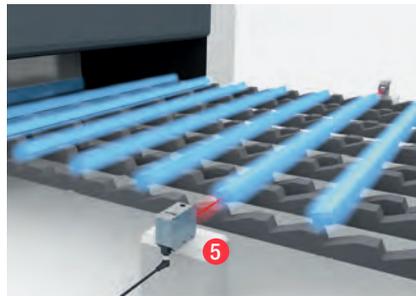


**ADDITIONAL SENSOR PROTECTION
WHEN THE SYSTEM IS STOPPED
With BOS photoelectric sensors**

Protective enclosures for photoelectric sensors directly on the casting line are a sensible addition. The advantage: the sensors used do not have to withstand elevated temperature demands and are also able to handle temperature spikes should the system go down. This is because you can equip the protective housing with water cooling. Also, optional is a blower for preventing the buildup of dirt and contaminants.

Features

- Rugged, compact IP69K housing
- Optional with ATEX approval (Zone 22)
- Simple and quick to install
- Protective tubing for sensor cable available

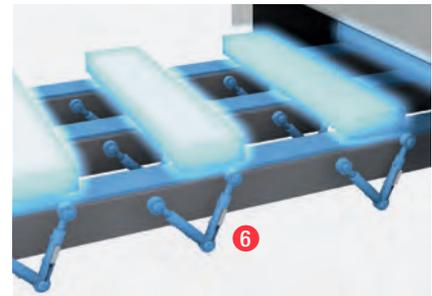


**CHECKING SLAB LENGTH
With BOD photoelectric distance sensors**

Our photoelectric distance sensors are the optimum solution for measuring at the cooling section. There they check for the correct length of the cut slabs or billets with high precision. The exact length is monitored using the difference between two sensor results.

Features

- Independent of material and color
- Contact-free and therefore wear-free



**SLAB TRANSPORT
ON THE WALKING BEAM
With BSI inclination sensors**

Precise location monitoring and continuous guiding of rotary movements are critical when transporting slabs. BSI inclination sensors are an outstanding solution to this challenge. On the walking beam they measure the deviation from the horizontal line on an axis by up to 360° – non-contact and with the highest precision.

Features

- Space-saving and rugged for use at –40...85 °C)
- No mechanical coupling needed in contrast to rotary encoders



Hot rolling and heavy plate production

FOR A CONTINUOUSLY RELIABLE PROCESS.

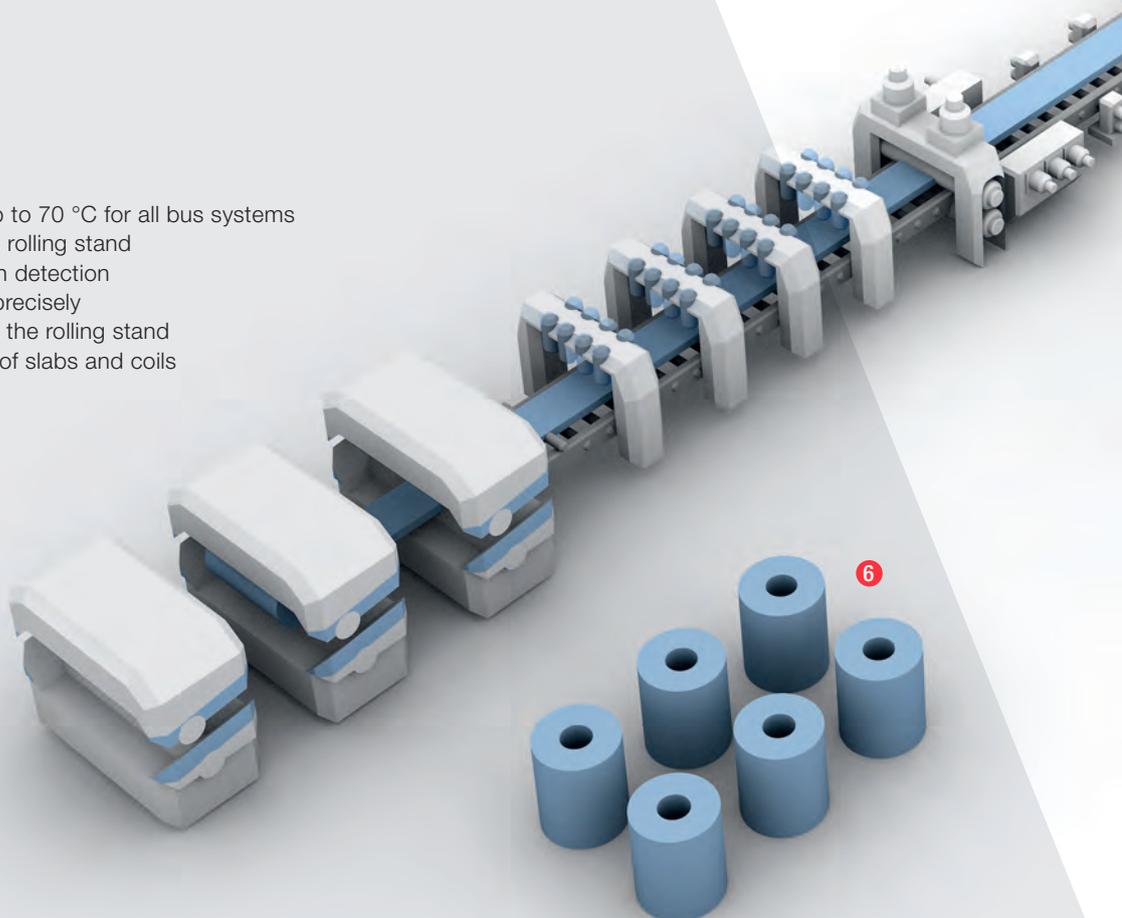
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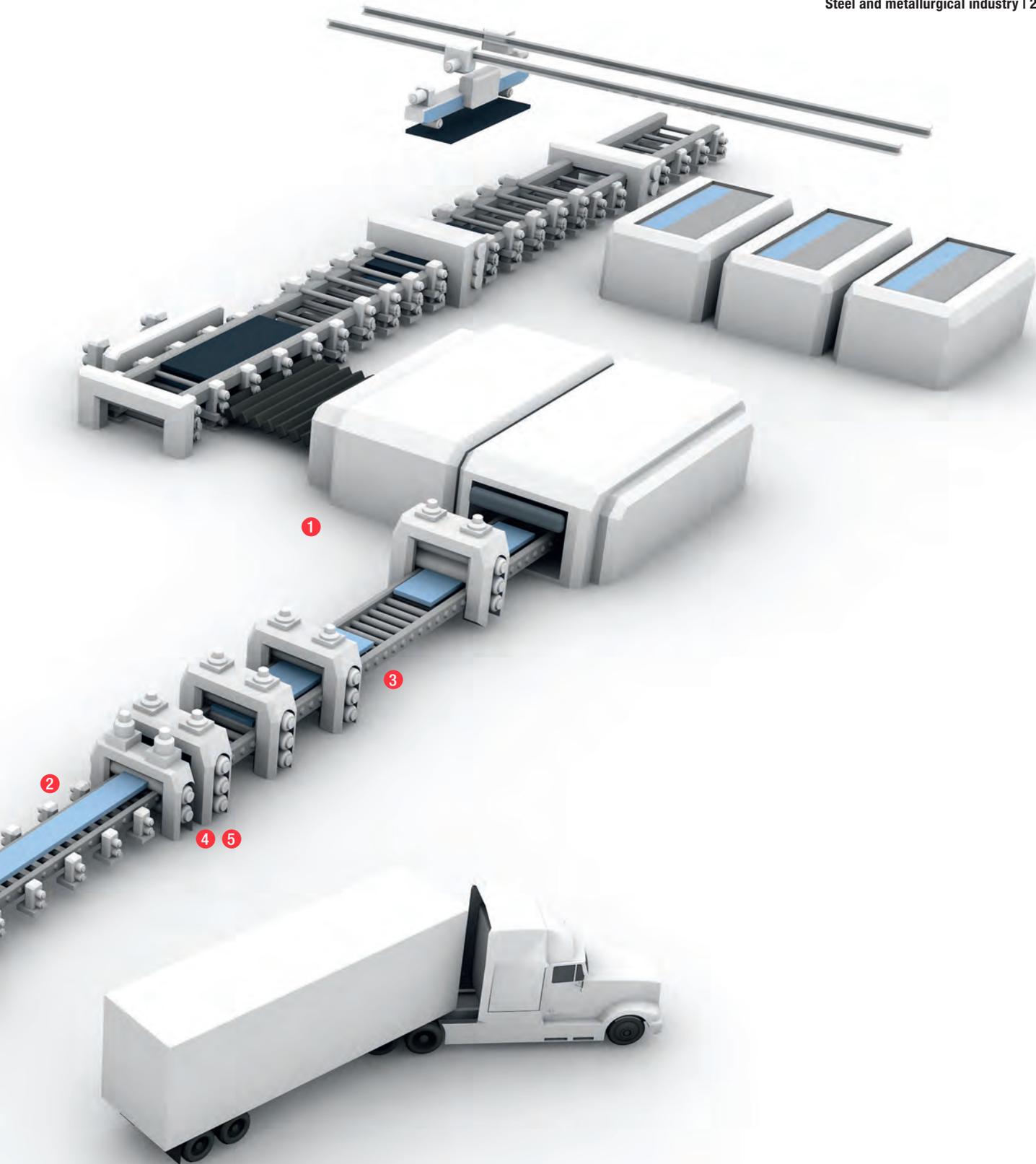
Hot rolling and heavy plate production are always associated with great forces. Shock, vibration and applied forces are typical here: for example, when rolling and cooling or cutting to finished dimensions along with the accompanying inspection steps. The equipment also needs to withstand moisture on the rolling mill caused by water cooling.



Solutions for hot rolling and heavy plate production

- 1 Fieldbus modules up to 70 °C for all bus systems
- 2 Slab guidance in the rolling stand
- 3 Reliable slab position detection
- 4 Setting the roll gap precisely
- 5 Quality assurance at the rolling stand
- 6 Correct assignment of slabs and coils





As a heavy plate producer you need high-performance equipment and suitable regulating devices at every process stage. With Balluff you get first-class technology to master all the stages from the slab to the coil: fieldbus modules, temperature sensors, position measuring systems, Industrial RFID systems and vision sensors.

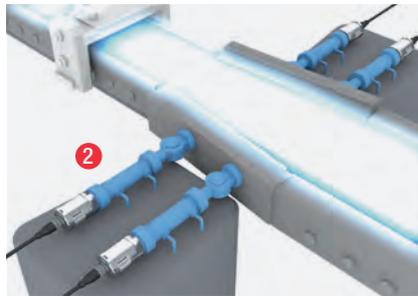


**FIELDBUS MODULES UP TO 70 °C
FOR ALL BUS SYSTEMS
With BNI network modules**

Modules for use in steelworks with functional security up to 70 °C simplify your network topology. Regardless of which bus system you are using, our BNI fieldbus modules let you construct modular networks. And additionally available IO-Link versions make it possible to effectively and inexpensively wire all sensors.

Features

- Construct networks regardless of the controller manufacturer
- Protection class IP67
- Functionally safe up to 70 °C



**SLAB GUIDANCE IN
THE ROLLING STAND
With BTL magnetostrictive sensors**

Compensate for the great forces created during forming safely and reliably. Our BTL magnetostrictive linear position sensors in the hydraulic cylinder are ideal for positioning and guiding the slabs. They check for the correct configuration of the lateral guides and accompany the slabs on their path through the rolling stand.

Features

- Protected against harsh conditions, because it is integrated in the cylinder

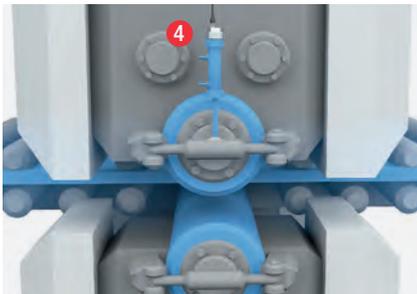


**RELIABLE SLAB POSITION DETECTION
With BTS temperature sensors**

Infrared temperature sensors earn their keep not only at the transition from the continuous casting line to the rolling stand. Designed for high temperatures, they also monitor – without contact – the slab transport at the reversing mill, so that the slabs can be quickly and very precisely rolled out. These sensors in the rugged M30 stainless steel housing have a multi-function display as well as an automatic display orientation and in the IO-Link version offer all the advantages of this innovative communication standard.

Features

- Secure detection of moving, glowing hot objects
- Simple, self-explanatory commissioning operation
- Available with IO-Link or analog interface



SETTING THE ROLL GAP PRECISELY With BTL magnetostrictive sensors

Our BTL magnetostrictive linear position sensor with IP69K protection is ideally suited for setting the roll gap with high accuracy. It withstands the extreme ambient conditions of the steel plant with absolute sealing integrity and, therefore, requires no additional protection from the continuous water cooling of the rolling stands.

Features

- Protection type IP69K
- Wear-free, long service life thanks to non-contact operating principle



QUALITY ASSURANCE AT THE ROLLING STAND With BIS industrial RFID systems

Prevent errors during the process using increased automation. With the Balluff BIS M Industrial RFID system, you can automatically record and identify all tools used. This lets you quickly check whether the correct rolls are being used or whether the roll pairs match. At the same time, reworking of the rolls is documented. This consistently prevents errors and allows you to perform maintenance at just the right time.

Features

- RFID handhelds for mobile communication right at the plant

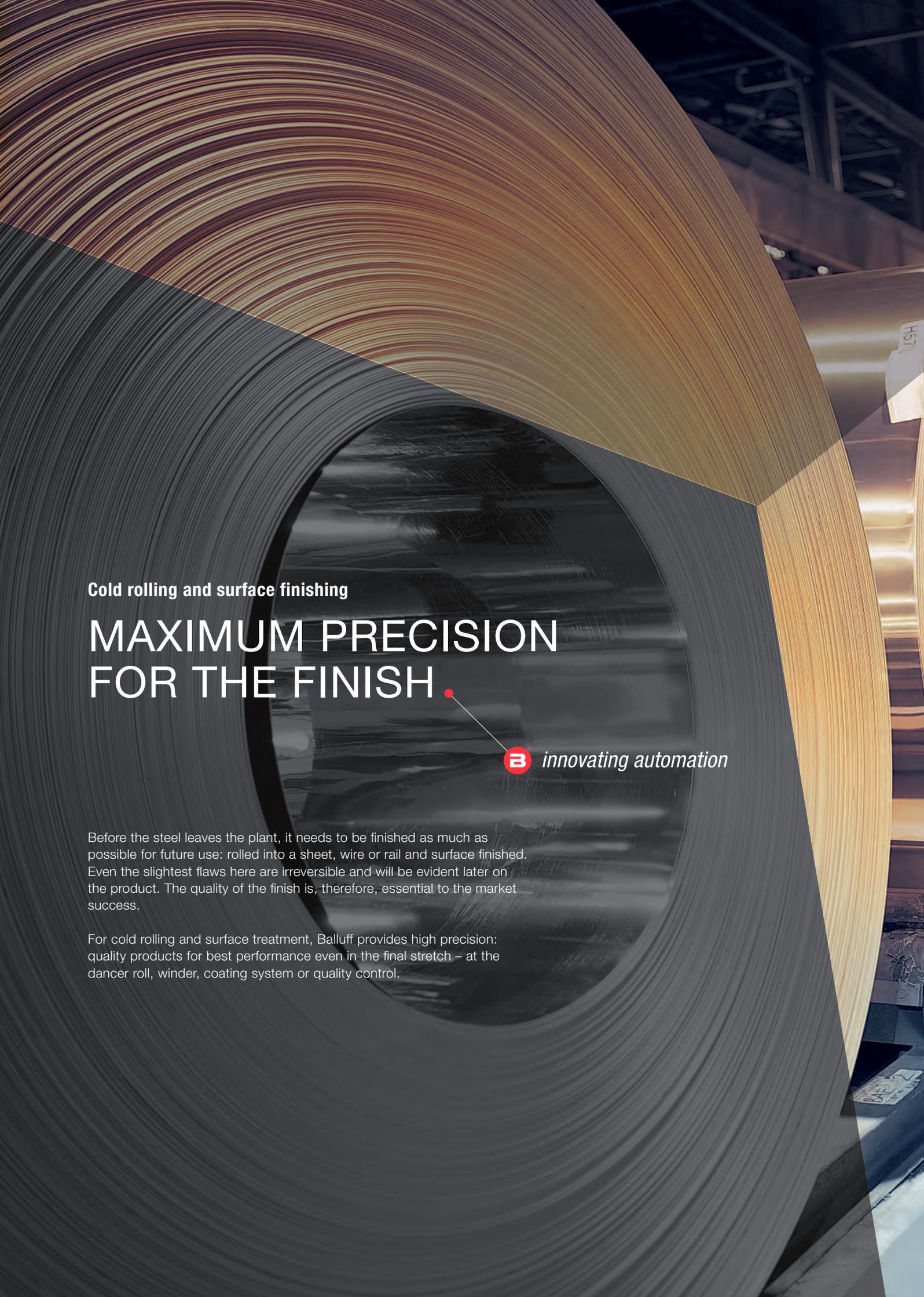


CORRECT ASSIGNMENT OF SLABS AND COILS With the BVS SmartCamera

Reliable reading is also possible under challenging conditions. Simply use color codes and barcodes to clearly identify coils and other products. The Balluff BVS vision sensor uses these markings to check whether slabs and coils are correctly assigned. Quickly, reliably and regardless of their position.

Features

- External monitor for better process tracking
- Extensive range of accessories that meet industrial standards



Cold rolling and surface finishing

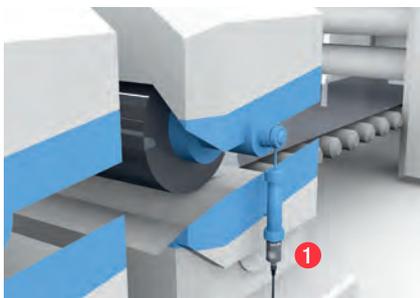
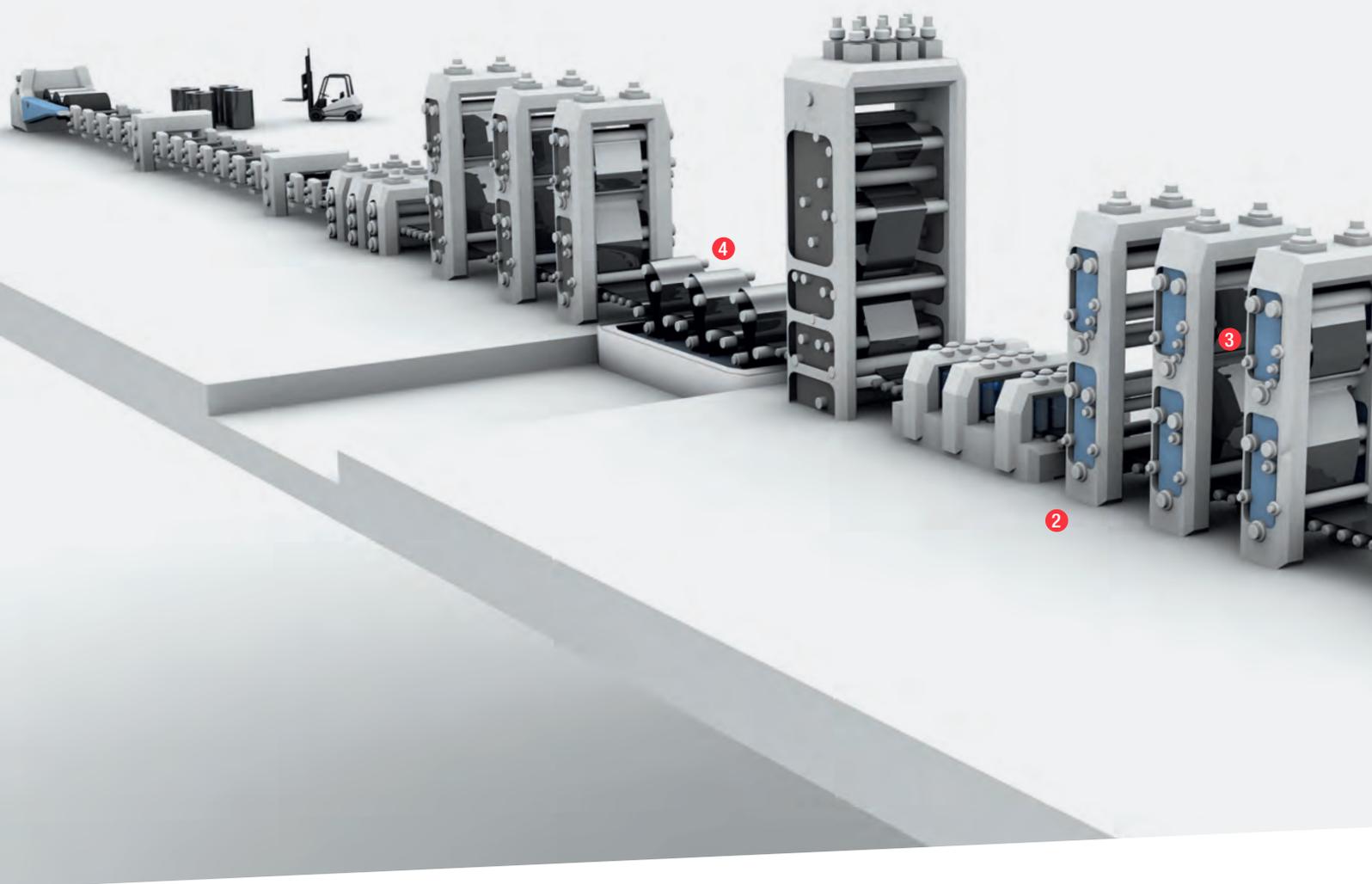
MAXIMUM PRECISION FOR THE FINISH

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Before the steel leaves the plant, it needs to be finished as much as possible for future use: rolled into a sheet, wire or rail and surface finished. Even the slightest flaws here are irreversible and will be evident later on the product. The quality of the finish is, therefore, essential to the market success.

For cold rolling and surface treatment, Balluff provides high precision: quality products for best performance even in the final stretch – at the dancer roll, winder, coating system or quality control.





**CORRECT ROLL POSITION
AT THE WINDER AND UNWINDER
With BTL magnetostrictive sensors**

Are you looking for a solution for optimal winding? Then our BTL magnetostrictive linear position sensors are the right choice. They are used wherever high reliability and accuracy are required, and also guarantee the highest precision when winding coils during cold rolling. For example by guiding the pressure roller as a function of the roll diameter.

Features

- Contact-free and therefore wear-free
- IP67 protection against contamination



**PRESSURE MEASUREMENT
DURING SURFACE FINISHING
With BSP pressure sensors**

Functional reliability during surface finishing is guaranteed by our HCL-resistant BSP pressure sensors, because they enable reliable pressure measurement of process media even if they come into contact with aggressive media such as hydrochloric acid.

Features

- Acid-resistant process connection made of PVDF

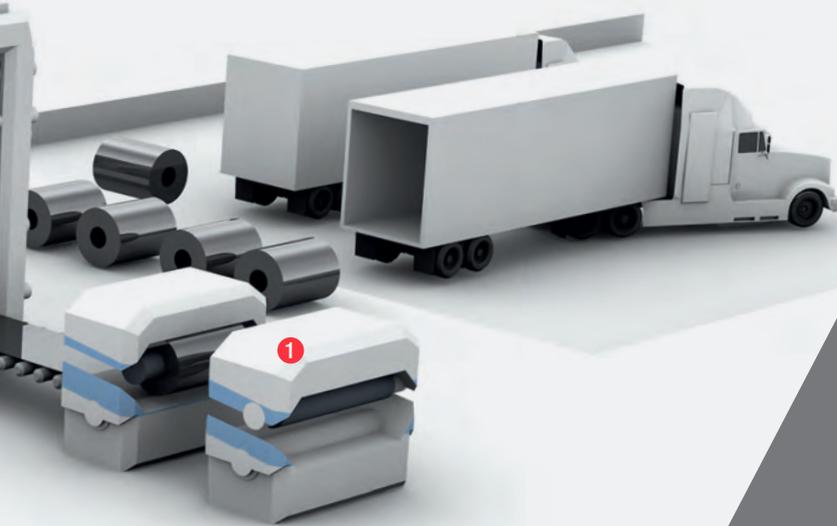


**SHEET FEEDING FOR THE COIL
With BUS ultrasonic sensors**

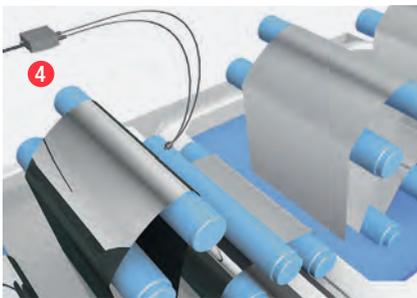
BUS ultrasonic sensors from Balluff are precision all-rounders. They detect sheets on rolls and coils and regulate the correct material feed on the dancer roll according to the sheet sag. In this way they ensure the correct roller drive and that the sheet tension is always perfect.

Features

- Contactless detection
- Reliable under demanding requirements and harsh conditions



Solutions for cold rolling and surface finishing



QUALITY CONTROL AT THE FINISHING SYSTEM With BFS color sensors

Fulfilling your highest quality requirements: the BFS color sensor from Balluff is unrivaled in inspecting sheet and plate finishes. It detects even the slightest color nuances and reliably registers whether a sheet leaves the plant polished or unpolished. Even temperature fluctuations won't keep it from correctly and reliably distinguishing the finished pieces.

Features

- Distinguishes any number of colors
- Three digital outputs and a serial interface for performing evaluations (direct output of Lab color values)
- Large sensing distance up to 400 mm

INNOVATIVE SOLUTIONS FOR ALL REQUIREMENTS





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PRODUCT OVERVIEW



| Application | Product group | Example | Functions, interfaces and properties |
|-------------|---------------|---------|--------------------------------------|
|-------------|---------------|---------|--------------------------------------|

COKING MACHINES, COKE OVEN BATTERIES AND CONVEYING EQUIPMENT

| | | | |
|--|------------------------------|------------------------|--|
| Position detection at the pusher machine | BES inductive sensors | BES021M | 40 × 40 mm, PNP, NO/NC, range 40 mm, non-flush installation, IP67 |
| Coke oven battery control | BTL magnetostrictive sensors | BTL7-...-J-DEX-TA12* | Rod style, approvals for Ex zones (CE, CSA, EAC, IECEx), non-contacting, SSI, analog, Profibus, stroke lengths up to 7620 mm |
| For all movements at the coke oven battery | BTL magnetostrictive sensors | BTL7-E...-H-SA262-...* | Rod style, stainless steel, analog, stroke lengths up to 7620 mm, 100 °C, IP68 |
| Control the pusher cars | BIS industrial RFID systems | BIS00ZF | Processor unit, HF 13.56 MHz, Profibus, IP65 (with connector) |
| | | BIS00WL | Antenna, HF 13.56 MHz, read/write distance 0...300 mm (with BIS00Y5), square antenna, IP65 |
| | | BIS00Y5 | Data carrier, HF 13.56 MHz, 112 bytes, IP67 |

BLAST FURNACE AND ELECTRIC ARC FURNACE

| | | | |
|---|------------------------------|------------------|--|
| Electrode monitoring in the electric arc furnace | BKT contrast sensors | BKT000Y | 12 × 50 × 42.5 mm, PNP, NO/NC, range 17...21 mm, rugged metal housing |
| Assuring the correct electrode position | BES inductive sensors | BES02JZ | M12 × 1, PNP, NO, range 3 mm, magnetic field immune (AC/DC), weld-immune, IP67 |
| Measuring the inclination of the casting ladle | BSI inclination sensors | BSI0004 | 21 × 28 × 87.5 mm, fluid-based measuring system, 0...360°, simple installation, resolution ≤ 0.01° |
| Pressure measurement for the water cooling | BSP pressure sensors | BSP00PL | Range 0...2 bar, switching output PNP, IO-Link 1.1, media temperature -40...125 °C |
| Reliably regulating air and gas supply at the blast furnace | BTL magnetostrictive sensors | BTL7-E...-B-...* | Rod style, analog output 4...20 mA, stroke lengths up to 7620 mm, IP67 |
| Level monitoring of charges and coke | BUS ultrasonic sensors | BUS0045 | M30 × 1.5 (transducer head Ø 65 mm), PNP, NO/NC, range 600...8000 mm |

CONTINUOUS CASTING LINE

| | | | |
|---|------------------------------|------------------|---|
| Highest safety for casting ladle control | BTL magnetostrictive sensors | BTL7-E...-TB...* | Rod style, two or three times redundant, analog, stroke lengths up to 7620 mm |
| Position sensing at the dummy bar | BMF magnetic field sensors | BMF001Z | Ø 10 × 32 mm, ambient temperature -40...85 °C, stainless steel (1.4571), IP69K |
| | BAM magnets | BAM01EL | Ø 25 × 15 mm, Neodymium Iron Boron |
| Fast sensor replacement without leaks | BTL magnetostrictive sensors | BTL7-...-BN-...* | Rod style, leak-free replacement of the sensor unit, various interfaces available, IP67 |
| Additional sensor protection when the system is stopped | BOS photoelectric sensors | BOS026R | 15 × 50 × 42.5 mm, 2 × PNP/NPN/push-pull, NO/NC, IO-Link 1.1, All-in-one: Diffuse with background suppression, diffuse, retroreflective, through-beam |
| | BAM protective housings | BAM029L | 84.1 × 107 × 124.5 mm, ambient temperature -5...90 °C, with optional cooling, max. 160 °C, min. 0 °C (water 8 °C, 2 l/min), ATEX |
| | BAM water connections | BAM029P | Water connection for protective housing, for optional water cooling |

| Application | Product group | Example | Functions, interfaces and properties |
|------------------------------------|---------------------------|---------|--|
| Checking slab length | BOS photoelectric sensors | BOD000U | 35 × 70 × 90 mm, analog, voltage 0...10 V, 2 × PNP, NO, range 200...2000 mm, laser red light |
| Slab transport on the walking beam | BSI inclination sensors | BSI0002 | Fluid-based measuring system, -45...45°, simple installation, resolution ≤ 0.01° |

HOT ROLLING AND HEAVY PLATE PRODUCTION

| | | | |
|--|------------------------------|-------------------|--|
| Fieldbus modules up to 70 °C for all bus systems | BNI network modules | BNI0065 | 68 × 37.9 × 224 mm, Profibus, ambient temperature -5...70 °C, 4 × analog, voltage/analog, current, additional interfaces 4 × BTL P-111, zinc die-cast, IP67 |
| Slab guidance in the rolling stand | BTL magnetostrictive sensors | BTL5-T...-B...* | Rod style, stroke lengths up to 4000 mm, Profibus, IP67 |
| Reliable slab position detection | BTS temperature sensors | BTS0002 | Ø 30 × 190 mm, IO-Link 1.1, simple to configure, range 250...1250 °C, switching output 2 × PNP, NO/NC, stainless steel housing (1.4404) |
| Setting the roll gap precisely | BTL magnetostrictive sensors | BTL5-P1...-HB...* | Rod style, stainless steel (1.4404), P111, stroke lengths up to 4000 mm, IP69K (with cable protection) |
| Quality assurance at the rolling stand | BIS industrial RFID systems | BIS M-87...-...* | Handheld HF (13.56 MHz) |
| | | BIS00YE | Ø 24.9 × 4.8 mm, HF (13.56 MHz), installation with clear zone (in steel), storage temperature -40...220 °C |
| Correct assignment of slabs and coils | BVS SmartCamera | BVS002F | 62 × 55 × 110 mm, LAN (Gigabit Ethernet), Profinet, Ethernet/IP, IO-Link, object inspection, analyzing color, measurement, object detection, positioning, barcode, 2D-, OCR-identification |

COLD ROLLING AND SURFACE FINISHING

| | | | |
|--|------------------------------|--------------------------|---|
| Correct roll position at the winder and unwinder | BTL magnetostrictive sensors | BTL7-S...-B-SA350-FA...* | Rod style, stroke lengths up to 7620 mm, SSI, ambient temperature -40...95 °C, PTFE cable up to 200 °C, IP68 |
| Pressure measurement during surface finishing | BSP pressure sensors | BSP00LP | Range 0...10 bar, switching output 2 × PNP, IO-Link 1.1, media temperature -25...125 °C, process connection made of PVDF, resistant to aggressive media |
| Sheet feeding for the coil | BUS ultrasonic sensors | BUS000F | 80 × 80 × 50 mm, range 600...6000 mm, analog 4...20 mA, IP65 |
| Quality control at the finishing system | BFS color sensors | BFS000L | 21 × 58.3 × 74 mm, range 400 mm (with lens) 3 × PNP/NPN, NO/NC, color space CIE Lab, aluminum |
| | BFO optical fiber | BFO00C9 | Ø 6 × 25 mm, length 2 m, PMMA |

* Please contact our sales department to configure your product.



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