

Solutions for the Steel Industry

Market Solutions



SMART SOLUTIONS FOR
DEMANDING INDUSTRIES

BLH NOBEL
A VPG Brand

A Complete Solution

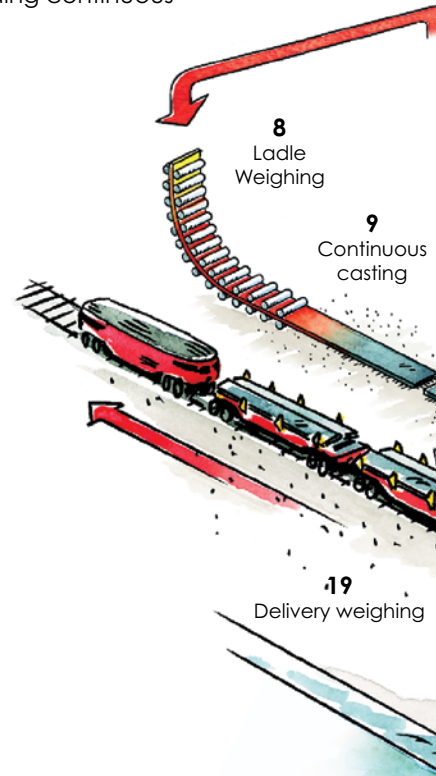
BLH Nobel offers both standard and custom made systems and solutions for force, tension and weighing for the steel industry. Our solutions and systems are designed and built specifically to meet the challenges of measuring in rough environments. That is why our products are proven to be robust, reliable and easy to use.

Our systems are designed to meet your needs and enhance your productivity by providing continuous excellent measurement accuracy in your production process.

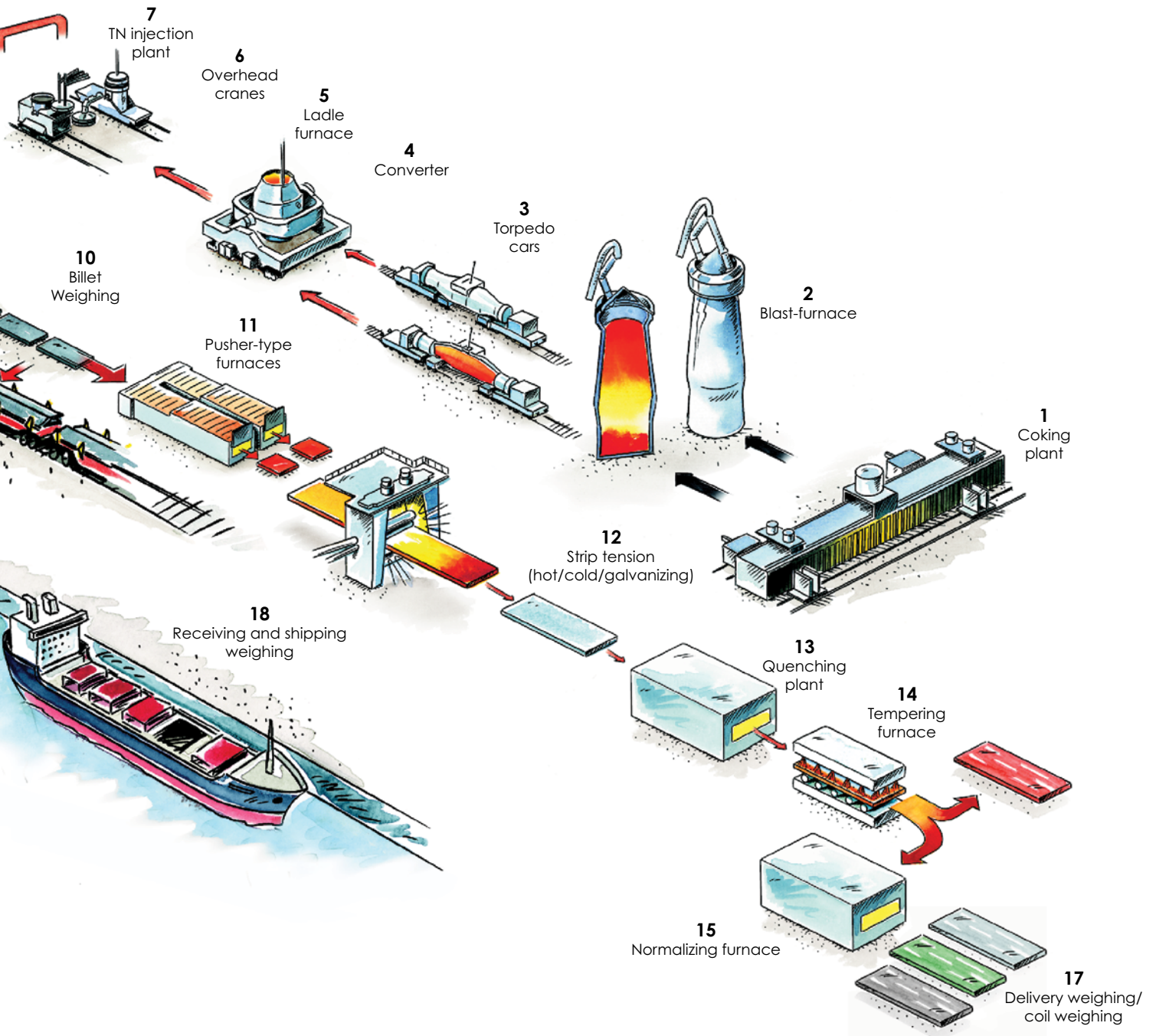
Application Key to Production Flowchart

1. Coke plant weighing systems
2. Mineral weighing—blast furnace
3. Torpedo or cigar weighing
4. Converter weighing systems
5. Ladle furnace weighing
6. Crane weighing/overload systems
7. Alloy additions weighing
8. Ladle Weighing
9. Tundish Weighing
10. Billet Weighing
11. Furnace weighing
12. Strip tension (hot/cold/galvanizing)
13. Furnace weighing
14. Roller straightening force system
15. Furnace weighing
16. Scrap weighing
17. Delivery weighing/coil weighing
18. Goods terminal weighing
19. Delivery weighing

Some of these applications are shown on page 4.



Production Flowchart



Examples of Solutions



1. Coke plant weighing systems



2. Mineral weighing—blast furnace



3. Torpedo or cigar weighing



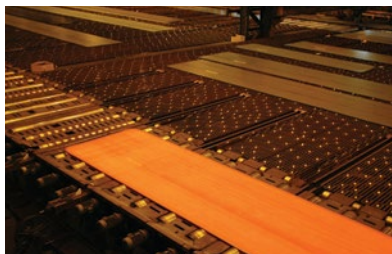
4. Converter weighing systems



5. Ladle furnace weighing



6. Crane weighing and overload systems weighing



7. Weighing and control on cooling table



8. Ladle Weighing



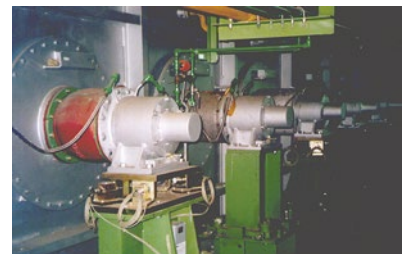
9. Tundish Weighing



10. Billet Weighing.



12. Strip tension (hot/cold)



11, 13 and 15. Furnace strip tension



14. Roller straightening force system



16. Scrap weighing



17-19. Stock/delivery weighing



Coil Weighing Systems

- Price-competitive solution for new installations or upgrades of existing systems
- Lightweight flat semi-platform solution, instead of a heavy U-beam structure, requires no trench, maximizes weigh to measure/tare ratio, and optimizes system accuracy
- Robust construction for reliable operation
- Optional OIML certification
- Full on-site installation, commissioning and support



Billet Weighing Systems

- Supports conveyor weighing and installations that require the billets to be lifted for weighing
- Allows cutting of billets by weight
- Robust construction for reliable operation
- Typical accuracy of $\pm 0.1\%$ FSD or better
- Full on-site installation, commissioning and support



Strip Tension Systems

- Mechanics are configured to deliver specific customer requirements
- FMU and PST sensors use standard KIS load cells, which are readily available, cost-effective, and shorten lead and maintenance down time Typical accuracy of $\pm 0.1\%$ FSD
- ATEX-certified for use in hazardous areas like furnace or coating lines
- Full on-site installation, commissioning and support



Weighing, Batching, and Overload Systems

- Weighing solutions for ladle, tundish, crane, scrap, etc.
- Overload protection in line with SIL and PL regulations
- Very high accuracy
- Special software available, e.g., Flow Rate or Life Cycle for Cranes
- Full on-site installation, commissioning and support

Weighing and Force Measurement Control

We have been a turnkey supplier of weighing and batching solutions for the steel industry for decades. Whether used to weigh fractions of a gram or thousands of tons. Our precision weighing systems address every imaginable weight-processing need—from 1600-ton converter scales to ingredient storage bins to clean-in-place batching processes.

Load Cells

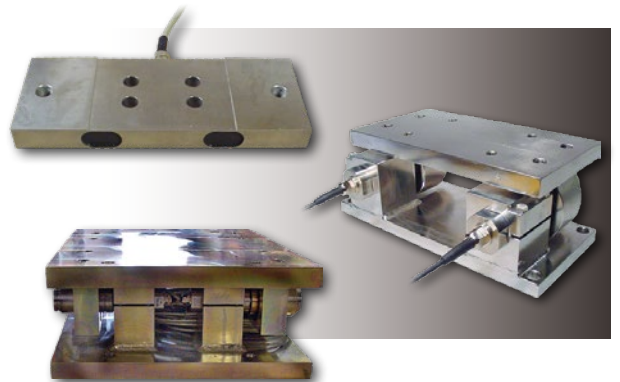
- Custom-designed and built for steel applications capacities up to 40 MN
- Replacement units for obsolete cells in machines, such as roller straighteners
- Washer-type cells for rolling mills
- Special one-off designs to solve particular applications
- Custom load cells are available up to 2 meter



Dynamic Resultant Force Measurement Control

Tensiometers

- Standard capacities of 2 kN to 400 kN; BLH Nobel-manufactured custom versions with higher values are available
- Drop-in retrofit options and low profile components available
- Components have a proven track record of high durability and reliability with close to zero maintenance and minimal downtime
- Accuracies of up to $\pm 0.1\%$ FSD
- High sensitivity



Instruments and Communication

G Series Instruments

- Wide variety of communication options via Ethernet, RS485 Serial Port, analog output and Fieldbus, such as ProfibusDP, PROFINET, Ethernet/IP, EtherCAT, DeviceNet, ControlNet.
- Easy set-up and diagnostics, embedded web server
- Easy installation and user-friendly LCD color touchscreen display with graphical user interface
- Full language support in English, French, German and Swedish
- Application software available; custom software for particular use scenarios supported
- 1-8 channels, with up to 800 updates per second at fully synchronized sampling
- OIML, FM, CE, UL, cUL certified versions available



History and Capabilities

Smart Solutions for the Metals Industry

BLH Nobel is a supplier of industry-leading and accurate advanced measurement and control systems for the steel industry. Our experience in this area is the result of several decades of innovation, starting with the development of force measurement blocks and instrumentation to measure strip tension. This technology led to the development of complete integrated measurement and control systems for the global metals industry, including systems for the measurement of weight and force. Our customers can be found all over the world in more than 100 countries.

Exceptional Competence, Skill and Experience

Our engineers have an unequalled track record of delivering successful steel solutions. We offer both standard and custom force, tension, and weighing systems to suit a wide variety of challenging measurement applications, and we support you through the entire lifecycle of our solutions. All of our products are specially selected by our engineers or are custom-developed to offer the best combination of robustness, reliability, accuracy, and ease of use. Our solutions are backed by reliable customer support from our office- and field-based staff. Our engineers are supported by our in-house R&D department and our own component manufacturing and software development capabilities, which enable us to provide the best solution for your specific needs.

Our systems are designed and built specifically to meet the challenges of the steel industry, to enhance productivity at maximized durability

A Strong Partner

BLH Nobel is a leading global manufacturer of equipment for force measurement and weighing applications. We are a part of the Weighing and Control Systems segment of our parent company, Vishay Precision Group, Inc. (NYSE:VPG), a producer of sensors based on resistive foil technology, and sensor-based systems. VPG provides vertically-integrated products and solutions for multiple growing markets in the areas of stress measurement, industrial weighing, and manufacturing process control.



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