PRIMETALS TECHNOLOGIES

PROTECT THE ENVIRONMENT AS EFFECTIVELY AS YOUR EMPLOYEES

MODERNIZATION PACKAGES TO MEET EVER STRICTER ENVIRONMENTAL REGULATIONS

TAKE THE FUTURE OF YOUR PLANT AND ITS ENVIRONMENT IN YOUR OWN HANDS
MODERNIZATION PACKAGES FROM YOUR LIFECYCLE PARTNER

MEET ENVIROMENTAL REGULATIONS AND REQUIREMENTS

Optimize CO_2 and waste reduction, save water, and reduce energy consumption to previously unattained levels. Our solutions detect resource inefficiencies and provide decisive improvements and thus enable you to meet ever stricter environmental regulations.

REDUCE PRODUCTION COSTS

Cut operational, maintenance and energy expenditures with innovative modernization packages which will optimize your production processes over the entire lifecycle of your steelmaking plant. The earlier investments are made, the sooner cost savings can be achieved.

EXTEND YOUR PRODUCTION MIX

Increase production flexibility and efficiency of your plant on the basis of proven solutions. Constant modernization, integrated into your production processes, will enable you to serve the market with a broader range of innovative products and lead to a new dimension of excellence.

ENHANCE QUALITY

Meet the steadily increasing market demands regarding steel grades and quality with sophisticated solutions for power, performance, product and quality control. Continuous real-time analysis is the key for improving metal or surface characteristics.

INCREASE SAFETY

Ensure the smooth running of your plant and protect your personnel with sophisticated automation packages. If there are breakdowns, emergency programs prevent possible downtimes, while logical, simple process screens make it easy to maintain an overview and full control of the process.

SAVE WATER

Save precious resources with state-of-the-art gas cleaning technology based on dry dedusting. This technology not only improves gas cleaning efficiency but it also eliminates the need for the water treatment plant of your former wet dedusting system. This of course can substantially reduce operating and maintenance costs.

PROTECT YOUR ASSETS FROM EVER STRICTER REGULATIONS
SOLUTIONS THAT CREATE ECONOMICAL AND ECOLOGICAL VALUE

The iron and steel industries are responsible for 30% of industrial CO_2 emissions and a number of other pollutants such as NO_x and fine-dust. For every metric ton of steel produced, about 25 kilograms of dust accumulate. This sector has therefore been a prime target of legislation to reduce gaseous and fine-dust emissions.

Old or outdated technology in steelmaking plants is simply not sufficient to meet ever stricter regulations. It takes great efforts to reduce the environmental impact of steel production, especially when you need to maintain or even increase productivity at the same time.

BRIDGE THE GAP

An active dialogue with customers in the development of new solutions, continual knowledge sharing with all participants, and addressing future global as well as regional needs are vital elements of our sustainable development and solutions. On this basis, we bring modernization technology to life that will help you meet the strictest environmental requirements in your region while ensuring a long-term sustainable growth.

FULFILL OR EVEN EXCEED ENVIRONMENTAL REQUIREMENTS

Meet ever stricter regulations without the need to make big investments in new facilities. As the world's only global full-line provider and your lifecycle partner, we possess unique expertise in the field of steelmaking technology and therefore can offer you highly effective modernization solutions, either in the form of single products or complete modernization packages. In conjunction with you as our partner, we will continue developing sustainable solutions that create economic, ecological and social value for all participants and over the entire lifecycle of your plant.
Protect the residents and your staff from dangerous emissions – and protect your assets from looming penalties. We help you achieve your environmental targets:

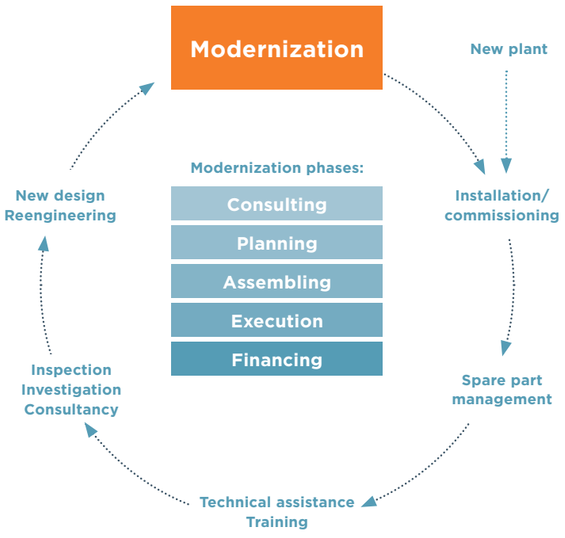
- Reduce CO_2 emissions
- Reduce fine-dust emissions
- Reduce cooling water consumption
- Reduce energy consumption

GET A CLEAR VIEW IN EVERY SITUATION
COMPLETE MODERNIZATION PACKAGES OR SINGLE PRODUCTS FROM YOUR LIFECYCLE PARTNER

The worldwide regulations for environmental protection are challenging nevertheless in most cases single improvements in the steelmaking process can be effective enough to achieve good results. As your lifecycle partner with deep insights, we can offer you both: fast and cost effective small improvements in the single process areas as well as overall performance improvements on the basis of major revamps.

Achieve fast and effective results without the need of making big investments in new facilities. We offer you a worldwide unique range of customized modernization solutions for environmental care in steelmaking, either in the form of single products or complete modernization packages. Our modernization portfolio for steelmaking focuses on solutions for gas cleaning, dedusting, by-product management and energy recovery.

The basis for improvements is our comprehensive know-how that results from decades of experience in the metals industry and our dedication to lifecycle partnership. As one of the world's leading lifecycle partners for the metals industry, we offer a comprehensive portfolio, which covers the entire lifecycle of metallurgical plants and which supports our customers in improving their competitiveness.



BE UP TO DATE IN EVERY ASPECT OF ENVIRONMENTAL PROTECTION

MEET THE MOST STRINGENT EMISSION REQUIREMENTS
PULSE JET FILTER

This modernization package includes standardized high-performance bag filters, which are designed for low and easy maintenance in a steel shop environment. The pulse jet filter permits future extensions with add-on components and requires low energy consumption and fully automatic filter cleaning. A flexible bag length allows reducing the footprint of the filter. Further advantages of this package are operation with low maintenance, flexible application for various types of dedusting applications, and fulfillment of most stringent emission requirements.

Additional features, such as automatic bag break detection or automatic pulse volve control are available.

REFERENCE
Customer: Dillinger Hüttenwerke, Germany
Plant type: 2 x 190 t LD(BOF)

DEDUSTING WITH THE BEST AVAILABLE TECHNOLOGY
PRIMARY ESP FOR LD(BOF) CONVERTER

The LD(BOF) converter offgas passes through a round-type dry electrostatic precipitator where the fine dust is removed by using the force of an induced electrostatic field. Dust collection, removal and extraction equipment is an integral part of the design. Dust can be collected in a dry state and directly fed to dust recycling plants. Most stringent emission requirements can be fulfilled and operation and maintenance requirements are low.

REFERENCE
Customer: US Steel Košice s.r.o., Slovakia - Steel shop 1
Plant type: 2 x 180 t LD(BOF)

INCREASE GAS RECOVERY WITH AUTOMATIC CONTROL
DRY DEDUSTING SYSTEM FOR LD(BOF)

In the Primetals Technologies switch-over station, the diversion of LD(BOF) converter gas flow from flaring to recovery is achieved by simultaneous opening and closing of cup valves, each located in the respective duct branches of flare and gasholder. Actuation of the valves is carried out by a hydraulic unit which also provides the necessary safety functions. All functions of the switch-over valves are automatically controlled by an integrated small PLC with all the necessary process interfaces and interlocks. The unit comes pre-assembled and pre-tested, thus significantly reducing time for testing and setup.

REFERENCE
Customer: Shougang Jingtang United Iron & Steel Co., Ltd., P.R. China
Plant type: 5 x 300 t De-C/De-P

EXPERIENCE MAXIMUM POSSIBLE EFFICIENCY
WET DEDUSTING SYSTEM FOR LD(BOF)

The switch-over station is provided for the gas recovery of LD(BOF) converters. It comprises a three-way valve for directing the gas either to the flare stack or to the gas holder. Additionally, a bypass valve is included for safety reasons.

All valves are operated by hydraulic cylinders according to process information and interlocks. Independent safety features are provided in the control and in the hydraulic system. In order to avoid a loss of sealing effect, the valve seats are equipped with a special automatic cleaning system. Furthermore, an integrated and independent small PLC is part of this package.

REFERENCE

Customer: US Steel Košice s.r.o., Slovakia - Steel shop 2
Plant type: 2 x 180 t LD(BOF)

ACHIEVE BETTER COOLING RESULTS WITH LESS WATER USE
GAS COOLER FOR HIGHEST COOLING EFFICIENCY

In order to minimize the volume of the LD(BOF) converter gas stored in the gas holder, it is cooled down in a gas cooler to a temperature of approximately 70°C or lower. The design is extremely efficient and reliable. Water flow rates can be automatically adjusted in order to minimize water consumption. Closed-loop operation with a secondary water cooler ensures independent operation from plant water systems.

REFERENCE

Customer: Baotou Iron and Steel Group, P.R. China
Plant type: 2 x 180 t LD(BOF)

EMPOWER YOUR DEDUSTING SYSTEM TO ABSORB MORE
STATIC COOLER FOR LD(BOF)

The coolers are the central functional equipment in secondary dedusting systems. They are designed to absorb the major part of the heat energy which is loaded into the system during hot metal charging. Temperature peaks can be absorbed, thus protecting the filter bags from damage and increasing the net suction capacity of the system. The design also makes it possible to fit the static coolers into existing ducts.

REFERENCE

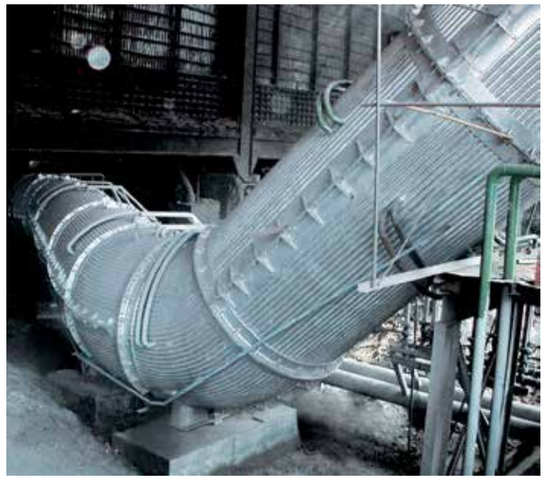
Customer: POSCO Pohang Steel Works, South Korea
Plant type: 2 x 300 t De-C/De-P

INCREASE GAS RECOVERY WITH AUTOMATIC CONTROL
DRY DEDUSTING SYSTEM FOR LD(BOF)

In the Primetals Technologies switch-over station, the diversion of LD(BOF) converter gas flow from flaring to recovery is achieved by simultaneous opening and closing of cup valves, each located in the respective duct branches of flare and gasholder. Actuation of the valves is carried out by a hydraulic unit which also provides the necessary safety functions. All functions of the switch-over valves are automatically controlled by an integrated small PLC with all the necessary process interfaces and interlocks. The unit comes pre-assembled and pre-tested, thus significantly reducing time for testing and setup.

REFERENCE

Customer: Shougang Jingtang United Iron & Steel Co., Ltd., P.R. China
Plant type: 5 x 300 t De-C/De-P



EXPERIENCE MAXIMUM POSSIBLE EFFICIENCY
SELF-CLEANING AND LOW MAINTENANCE POWER COOLER

Hot offgas coming from the EAF or full combustion converter dedusting systems can be effectively cooled by means of a forced draft cooler. Cooling air is blown through the cooling pockets by air blowers, which are controlled by the target outlet temperature. Due to its pocket design, the plate-type cooler is self-cleaning, requires minimal maintenance and ensures high levels of operational availability.

REFERENCE
Customer: Nervacero S.A. - Celsa Group, Spain
Plant type: 30 t AC-EAF

BENEFIT FROM PROVEN DUCT DESIGN
WATER COOLED DUCT

Hot offgases are drawn from the electric arc furnace through the water-cooled duct system in a tube-tube design. Sufficient post combustion is ensured by adjusting the gap between the water-cooled furnace elbow and the fixed elbow by means of a movable sliding sleeve. The design of water-cooled sections is optimized with respect to water flow rate, delta T and available water pressure.

A drop-out box is provided to remove coarse dust and slag particles after the furnace elbow. The water-cooled duct routing is flexible in order to suit existing melt shop layouts.

REFERENCE
Customer: Scaw Metals Group, South Africa
Plant type: 75 t EAF

ACHIEVE MAXIMUM ENERGY RECOVERY
COOLING STACK

Offgas cooling for converter gas based on a high-pressure system or steam generation system with flexible design solutions for retro-fitting: The cooling stack is designed to cool the hot converter gases. For energy recovery, the cooling stack can be designed as a waste heat boiler to use the high thermal energy content of the converter gas for steam generation. Various designs are available, especially for routing and split, in order to best meet special requirements and layouts. The high thermal loads require the use of best design and manufacturing.

REFERENCE
Customer: Arcelor Mittal Eisenhüttenstadt
Plant type: 2 x 240t LD(BOF)

BOOST THE PERFORMANCE OF YOUR WET DEDUSTING
WDS CONE - WET DEDUSTING SYSTEM FOR LD(BOF)

Gas quenching takes place in a spray quencher, which is followed by the main scrubbing process in the annular gap scrubber element. The scrubber element is controlled by a hydraulic actuation system. Final droplet separation is achieved in a low-maintenance droplet separator. High-performance gas cleaning is provided along with smooth gas suction control. An integrated and independent small PLC is part of this WDS Cone package. The flexibility of the layout allows for easy retro-fitting into existing steel shops. Water consumption is lower than for old wet-type gas cleaning systems, while the cleaning efficiency is higher.

REFERENCE
Customer: US Steel Košice s.r.o., Slovakia - Steel shop 2
Plant type: 2 x 180 t LD(BOF)

EXPERIENCE PERFORMANCE WITH SMOOTH CONTROL

WDS BAUMCO® - WET DEDUSTING SYSTEM FOR LD(BOF)

For gas quenching, a Hiper BAUMCO venturi throat is foreseen. Fine cleaning of the gas takes place in a secondary Hiper BAUMCO® venturi throat where water is injected laterally. An automatic nozzle cleaning system provides reliable operation of this Hiper BAUMCO package. High-performance gas cleaning is provided along with smooth gas suction control. An integrated and independent small PLC is part of this package. The flexibility of the layout allows for easy retro- fitting into existing steel shops.

REFERENCE

Customer: NLMK, Russia
Plant type: 3 x 180 t LD(BOF)

CAPTURE THE OFFGAS AND INCREASE SAFETY

DOGHOUSE

A doghouse is a complete enclosure that isolates the converter and evacuates the emissions generated during the steel production process. Sound emissions coming from the converter are reduced to an appropriate level. Safety on the working platform is also increased. Moveable doors provide full access at front side and back side. Furthermore, heat protection is provided in the exposed areas through the use of heat-resistant materials such as hematite or hexgrate.

REFERENCE

Customer: voestalpine Stahl, Linz, Austria
Plant type: 3 x 180 t LD(BOF)

INCREASE YOUR QUENCHING EFFICIENCY

SPRAY COOLER

The quenching tower is equipped with a dioxin reduction system including a two-stage cooling process. The design of the tower significantly determines the chemical composition of the dust and can reliably stop the formation of dioxin. Compared to conventional hairpin coolers, this modernization package is distinguished by a number of advantages. The inlet temperature can be up to as much as 1,000°C and space requirements for water precooling are correspondingly smaller. Also, the pressure drop in primary dedusting is significantly smaller, thereby reducing energy consumption of the fans. A quick and easy cleaning as well as lower maintenance times are further advantages.

REFERENCE

Customer: Qatar Steel, Qatar
Plant type: 110 t EAF

REDUCE ENERGY CONSUMPTION UP TO 50%

REPLACEMENT OF A WET DEDUSTING SYSTEM

Wet dedusting systems have been in use for many years – dry-type dedusting is the most modern and efficient technology in terms of gas cleaning and energy efficiency. Operating costs for dry dedusting systems are significantly lower than for wet-type dedusting applications. Hence, Primetals Technologies offers a replacement of the old wet-type dedusting system for LD(BOF) converters with a new dry-type system. The existing scrubber tower in the melt shop is converted to the evaporation cooler. The electrostatic precipitator can be located outside of the steel shop. This package guarantees a reduction of energy consumption by 50% as well as lowest clean-gas dust contents of 30 mg/Nm³ or below.

REFERENCE

Customer: Baotou Iron and Steel Group, P.R. China
Plant type: 2 x 210 t LD(BOF)

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