Clean air for the iron & steel industry

Emission Control by GEA Bischoff
Gas Cleaning Technology integrated in the Iron & Steel Production Process

GEA Bischoff GmbH is a leading supplier of innovative gas cleaning and energy recovery technologies and represents together with the GEA Niro technology the strategic business unit „Emission Control“ within the GEA Process Engineering segment.

Along the iron and steel production, environmental and energy saving considerations are an integrated part of the process. Taken this into account, GEA Bischoff offers clean air solutions while keeping the CAPEX/ OPEX low.

With our wide portfolio of:

• Exhaust systems
• Dust collection
• Gas conditioning systems
• Dry, semi-dry and wet desulphurization
• NOx abatement
• Separation of dioxins and furans
• Removal of acid components
• Waste heat recovery

and a long experience of 100+ years, we can handle the challenges posed by your production process.

GEA Process Engineering

Emission Control is a strategic business unit within GEA Process Engineering, a segment of the GEA Group, headquartered in Germany and listed on the stock exchange (GeA, WKN 660200).

GEA Process Engineering develops, designs and markets production plant equipment and processes for mainly the dairy, brewery, food, pharmaceutical and chemical industries. With a turnover of approx. EUR 1.8 billion in 2013 and close to 5,900 employees working in 40 countries, GEA Process Engineering is recognized as a world leader within industrial drying, gas cleaning, concentration, liquid processing, powder processing and handling.
The proven dedusting processes and components by GEA Bischoff

**SINTERING AND PELLETIZING PLANTS**

Dust collection of sinter strand and cooler exhaust gas by dry type horizontal precipitators. Other relevant pollutants such as SO₂, HF, PCDD/F and heavy metals are treated by waste gas cleaning plants consisting of:

- Dry flow adsorber using hydrated lime and activated carbon. This solution consists of an Entrained Flow Reactor (EFR), a dust recirculation unit and dust collection with a low pressure cleaned fabric filter or
- Spray Drying Absorber (SDA) operated with lime slurry and further dust collection with low pressure cleaned fabric filters

**COKE OVEN PLANTS**

Detarring of coke oven gas by wet-type vertical precipitator.

**CAST HOUSE AND STOCKHOUSE**

Secondary emissions when tapping a blast furnace or transferring hot metal from the torpedo to the paddles and converters are collected by means of hoods and dedusted with low pressure fabric filters.

**ELECTRIC ARC FURNACE**

Primary gas is cooled by ambient air and mixed with secondary gases from canopy while finally dedusted in low pressure fabric filters.

**CONVERTER GAS CLEANING**

CO steelmaking generates waste gases containing high temperatures and high levels of dust.

The thermal energy will be recovered by boiler type cooling stack.

The dust is collected in a dry system with round type electrostatic precipitator (LURGI Thyssen LT process). The extracted dry dust can be reused in the steel-making process. In a second step the CO rich gas will be recovered and stored.

Alternatively we are also offering our wet Bischoff Scrubber system for converter gas cleaning.

**BLAST FURNACE GAS CLEANING**

Blast furnace top gas cleaning systems comprising of dust catcher or axial cyclone for the collection of coarse dust and Annular Gap Scrubber (Bischoff Scrubber) for the removal of fines and control of top gas pressure.

**THE KEY ADVANTAGES OF LT-PROCESS**

- Minimized energy consumption
- High steam / gas recovery rate
- Extremely low clean gas dust content
- Dry gas cleaning process with extraction of dry dust
- No waste water and sludge treatment required

**SINTERING AND PELLETIZING PLANTS**

Dust collection of sinter strand and cooler exhaust gas by dry type horizontal precipitators. Other relevant pollutants such as SO₂, HF, PCDD/F and heavy metals are treated by waste gas cleaning plants consisting of:

- Dry flow adsorber using hydrated lime and activated carbon. This solution consists of an Entrained Flow Reactor (EFR), a dust recirculation unit and dust collection with a low pressure cleaned fabric filter or
- Spray Drying Absorber (SDA) operated with lime slurry and further dust collection with low pressure cleaned fabric filters

**COKE OVEN PLANTS**

Detarring of coke oven gas by wet-type vertical precipitator.

**CAST HOUSE AND STOCKHOUSE**

Secondary emissions when tapping a blast furnace or transferring hot metal from the torpedo to the paddles and converters are collected by means of hoods and dedusted with low pressure fabric filters.

**ELECTRIC ARC FURNACE**

Primary gas is cooled by ambient air and mixed with secondary gases from canopy while finally dedusted in low pressure fabric filters.

**CONVERTER GAS CLEANING**

CO steelmaking generates waste gases containing high temperatures and high levels of dust.

The thermal energy will be recovered by boiler type cooling stack.

The dust is collected in a dry system with round type electrostatic precipitator (LURGI Thyssen LT process). The extracted dry dust can be reused in the steel-making process. In a second step the CO rich gas will be recovered and stored.

Alternatively we are also offering our wet Bischoff Scrubber system for converter gas cleaning.

**BLAST FURNACE GAS CLEANING**

Blast furnace top gas cleaning systems comprising of dust catcher or axial cyclone for the collection of coarse dust and Annular Gap Scrubber (Bischoff Scrubber) for the removal of fines and control of top gas pressure.

**THE KEY ADVANTAGES OF LT-PROCESS**

- Minimized energy consumption
- High steam / gas recovery rate
- Extremely low clean gas dust content
- Dry gas cleaning process with extraction of dry dust
- No waste water and sludge treatment required
Cleaning of recovered gas for power generation

Upstream the gas turbine, the recovered gas of the coke oven, Basic Oxygen Furnace (BOF) and Blast Furnace (BF) needs to be cleaned by horizontal Wet Electrostatic Precipitators (WESP) to protect the blades of the turbine.

WASTE HEAT RECOVERY (WHR) TO IMPROVE ENERGY EFFICIENCY

THE KEY SOURCE
- WHR from sinter cooler transferred by thermal oil for preheating of combustion air or production of electric power.
- GEA Bischoff offers energy recovery systems based on ORC technology (Organic Rankine Cycle), which is the most efficient solution for this application.

CUSTOMIZED ENGINEERING
The processes and technologies are the key for efficient and effective industrial gas cleaning. The design and equipment will be customized to local conditions and customer requirements. Experienced GEA Bischoff engineers will guide the entire process from planning to commission. Every step is aligned in cooperation with the customer.

SPARE PART MANAGEMENT
GEA Bischoff gas cleaning systems are service-friendly and contain long intervals between needed maintenance. For every project, the customer will receive a list of recommended spare parts to keep on stock for planned maintenance work. Our spare part department ensures fast delivery of required equipment. Unplanned downtimes are therefore minimized.

UPGRADES, SERVICES AND TRAINING
Examples:
- Electrostatic Precipitator (ESP) to Baghouse Conversions or Scrubber upgrades with Energy Recovery Systems to meet current and future emission requirements including:
  - Higher removal efficiencies
  - Capacity for increased gas volumes
  - Opportunities for online maintenance
  - Reduced operation costs

ESP Retrofit for energy optimization by using:
- Variovolt TR-set
- Real-time observation and power management

WORLDWIDE PRESENCE
With world-wide offices, the GEA Bischoff Emission Control business unit ensures you of fast support and service to your plant site.

Innovation is the key:
With our own Research & Development department, GEA Bischoff develops new technologies and continuously improves current designs.

GEA Bischoff is a supplier of gas cleaning systems. The range of services includes the planning/engineering and construction of plants as well as assembling, commissioning and maintenance services of the plant over the whole life cycle.

ESP-Retrofit for energy optimization by using:
- Variovolt TR-set
- Real-time observation and power management

WORLDWIDE PRESENCE
With world-wide offices, the GEA Bischoff Emission Control business unit ensures you of fast support and service to your plant site.

Innovation is the key:
With our own Research & Development department, GEA Bischoff develops new technologies and continuously improves current designs.

GEA Bischoff is a supplier of gas cleaning systems. The range of services includes the planning/engineering and construction of plants as well as assembling, commissioning and maintenance services of the plant over the whole life cycle.
We live our values.
Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

GEA Process Engineering
Business Unit GEA Emission Control

GEA Bischoff GmbH
Ruhrallee 311
45136 Essen, Germany
Phone: +49 201 8948 0
E-Mail: gea-bischoff@gea.com
www.geabischoff.com

GEA Process Engineering China Ltd
Room 1405, CITIC Building, No. 19
Jian Guo Men Wai Street
Chaoyang District
Beijing, 100004, China
Phone: +86 10 8526 2025

GEA Process Engineering (Pty) Ltd.
286 16th Road
1685 Midrand, South Africa
Phone: +27 11 805 6910
Mobile: +27 72 479 9019

GEA Process Engineering SAS
23 Quai de Paludate
33 000 Bordeaux, France
Phone: +33 5 5795 9566

GEA Process Engineering S.p.A.
Centro Direzionale Milano 2
20090 Segrate (MI), Italy
Phone: +39 02 2101 0611

GEA Process Engineering (India) Pvt LTD
Coral Square, 3rd floor
Vijay Garden Naka
Ghodbunder Road
Thane (W) 400 607, India
Phone: +91 98 3006 9550

GEA Process Engineering, ООО
ГЭА Процессный инжиниринг
Semenovsky Val st. 6, bldg. 1
105094 Moscow, Russia
Phone: +7 495 787 2020

GEA Process Engineering A/S
Gladsaxevej 305
2860 Søborg, Denmark
Phone: +45 3954 5454
E-Mail: niro@niro.dk

GEA Finland Oy
Hommotie 19
00560 Helsinki, Finland
Mobile: +358 (0)10 322 11 00

GEA Process Engineering Inc.
9165 Rumsey Road
Columbia, MD 21045, USA
Phone: +1 410 997 8700

GEA Process Engineering, ООО
ГЭА Процессный инжиниринг
Semenovsky Val st. 6, bldg. 1
105094 Moscow, Russia
Phone: +7 495 787 2020

GEA Process Engineering, ООО
ГЭА Процессный инжиниринг
Semenovsky Val st. 6, bldg. 1
105094 Moscow, Russia
Phone: +7 495 787 2020

GEA Engenharia de Processos e Sis. Ind. Ltda.
Prédio 4 D2, 1 Floor, Office 2
13051-750 Campinas, SP, Brazil
Phone: +55 19 3725 3001

www.gea.com