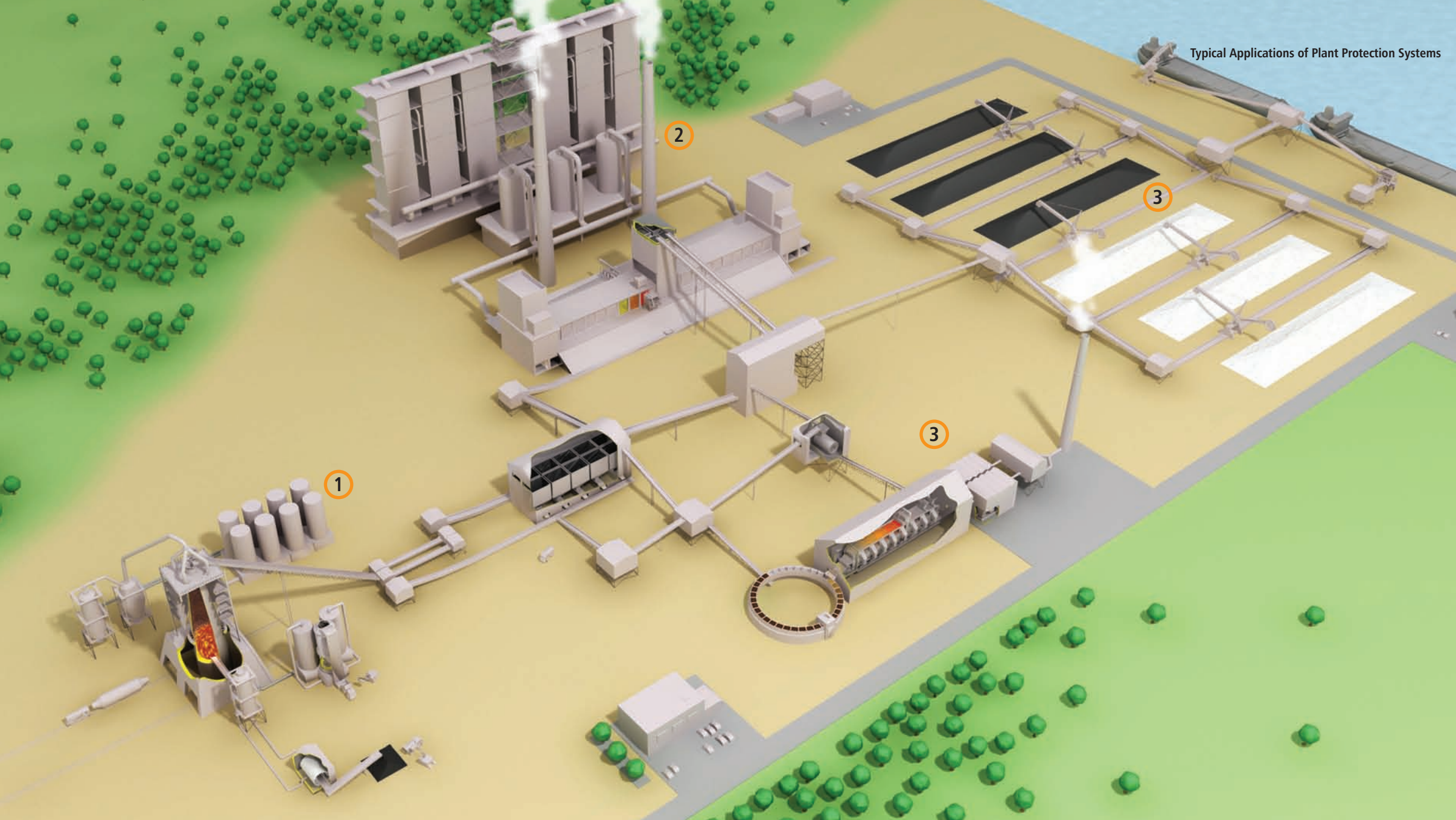


Protecting Industry Worldwide

FACT FILE

IRON MANUFACTURING





Typical Applications of Plant Protection Systems

In many instances, Kingfisher Industrial offers the full Turnkey package consisting of:

- Design
- Manufacture
- Protective Lining (both in-works & on-site)
- Erection
- Commissioning

Whether working on the:

- ① Blast Furnace
- ② Coking Plant
- ③ Ore Preparation plant

We offer bespoke solutions to the problems encountered with storage, conveying or processing abrasive bulk solids and by products.



Kingfisher

Understanding what's important

As with most commodities, steel manufacturers compete with other producers throughout the world for the supply of raw materials and likewise, its customer base. As the open market invariably dictates the purchase price of traditional finished product, quality, efficiency and an innovative product range are fundamental to a successful operation. Despite the large number of people employed within an integrated steel works, it is the efficiency of the process that makes the real difference in the cost of tonne produced. From sourcing superior grades of ores and minerals, to the blending process for both iron and steel making, and finally the casting and rolling of finished product, the right choices made here will determine the quality and market demand of the finished product.

Albeit new innovative technologies are now being introduced into the iron and steel making industry, traditional processes of manufacture are still the dominant method in producing the capacity needed to supply both the developed and emerging markets. As ever, the vast amount of both capital and maintenance expenditure is an ongoing circumstance of the industry due to the nature of processing millions of tonnes of abrasive bulk solid materials. From the

reception point of unloading panamax and capsize bulk carriers, through to the processing of plate, section and strip in the rolling mill, the amount of wear experienced through impact, friction and sliding induced abrasion is eating away the infrastructure of the equipment.

Plant protection is not a choice in the steel industry, it is a must.

Many operations buy into traditional methods of protection such as through hardened plate or rubber protective panels, however, forward thinking engineers push the boundaries on what methods of protection can be incorporated into the design of their plant that will cater for the effects of the different materials handled. Due to the nature of some extremely abrasive ores and minerals, no protective lining system will be unaffected by their characteristics, however Kingfisher, having worked within the industry for over twenty years have achieved many successes. **In exceeded expectations we continue to lead the way forward and let the rest follow.**



① Stockhouse & Charging System:

Tripper Chutes
Coke & Ferrous Hoppers
Screen Decks & Underpans
Weigh Hoppers
Skip Cars
Reception Hopper
Material Hoppers
Bifurcated Chute
Control Gates
Central Feed Chute

② Coal Injection System:

Raw Coal Reception Hopper
Coal Grinding Mills
Coal Classification Systems
Pneumatic Transfer Pipework
Pulverized/Granulated Coal Storage Silos
Coal Injection Pipework (manifolds, splitters etc.)
Flexible Tuyere Hose

③ Slag Handling Plant:

Hot Slag Coldrunners
Slag Granulation Tank
Granulate Break Boxes
Water Recycling Tank
Cooling Water Pipework
Gas Scrubbing Tower
Granulate Conveying Pipework
Dewatering Drum
Transfer Chutes

④ Gas Cleaning Plant:

Downcomers
Dustcatcher
Pneumatic Conveyor Pipework
Gas Scrubber
Fines Water Flume
Clarification Tank
Dewatering Conveyors
Hydrocyclones
Separators
Waste Gas Fan & Casing
Precipitator Ducting
Drag Link Conveyors



Making a difference

At the heart of an integrated steel works, the blast furnace is the focal point of the iron making process. In taking receipt of coke, iron ore, minerals and fluxes, the continual conveyance and storage of both fine and large size material causes excessive wear throughout the plant. Understanding operating conditions where factors such as volume, heat and extreme stresses are evident is critical in being able to **recommend the solution to the problem**.

In utilising our range of ceramic, metallic and polymer protection systems we have extended the operating life of critical processing plant and equipment beyond the expected service life. Having an in depth understanding of the process enables us to offer a system that is fit for purpose. Having benefited from undertaken many previous applications, it enables us to **offer a peace of mind warranty** on the success of the package where considerations such as protection, energy consumption and discharge are factored into the specification.





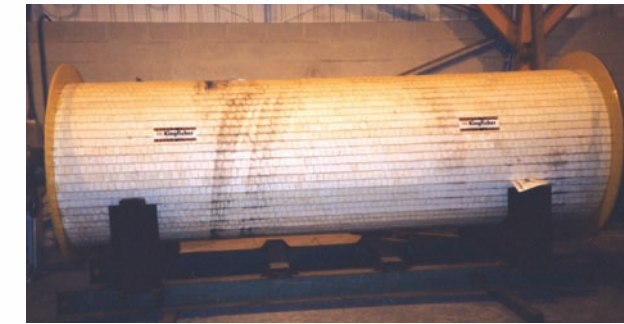
Typical Applications of Plant Protection Systems on the Coking & Ore Preparation plant



From start to finish

The burden preparation plant covers a vast area of land mass and encounters many issues with the unloading, handling, storage and processing of all minerals used in the manufacture of iron. These issues create many challenges that Kingfisher can proudly claim to have contributed to overcoming by working alongside both plant engineers and operational staff.

Control of product is key to the reduction of spillage and loss of minerals to atmosphere and by designing equipment that incorporates modern techniques of complex and proven geometries will prove successful. In realising the benefits of making the right decision at the start of the process, leads to ever increasing confidence in implementation throughout the plant resulting in **enhancing reward for all stakeholders concerned.**



1 Import Terminal:

Crane Grabs
Reception Hopper
Transfer Chutes
Vibrating Chutes
Loading Chutes
Reclaim Buckets
Barrel Reclaimers
Loading Hoppers

2 Ore Blending Plant:

Tripper Chutes
Blending Hoppers
Vibrating Feeders
Screen Decks & Underpans
Transfer Chutes
Weigh Hoppers
Stacker Reclaimers
Dust Extraction Plant

3 Burden Preparation Plant:

Reception Hoppers
Vibrating Feeders
Weigh Hoppers
Rod Crushing Mill
Pelletizing Drum
Sinter Strand Roll Feed Drum
Segregation Plate
Strand Car Castings
Sinter Crash Deck
Sinter Breaking Machine
De-dust Ducting
Sinter Screens & Underpans
Wind Box Ducting
Down Comers
En Masse Conveyors
Precipitator Ducting
Waste Gas Fan & Casing



Conveying confidence

Handling large tonnages of coal 24/7 takes its toll, and the fine line between ensuring continual operation and having to undertake on the spot repairs and maintenance makes the difference between financial gain and loss. In processing coal by means of crushing, screening, storage and conveyance of the fuel to the batteries, problems are apparent that have to be overcome and Kingfisher can assist with these operations. Having achieved significant benefits by incorporating our range of wear and corrosion protection systems, we can track the material to and from the batteries and by introducing best practice in terms of design, manufacture and protection; **achieve a significant return on investment** in the asset value of the plant.

1 Coal Plant:

Tripper Chutes
Reception Hoppers
Crushing Mills
Screening Equipment
Transfer Chutes

2 Coke Ovens:

Weigh Hoppers
Charge Wagons
Coke Quenching Cars
Quenching Baths
Recirculating Pipework
Coke Wharf
Paddle Feeders
Transfer Chutes





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