



# AIR POLLUTION CONTROL SOLUTIONS

**AAF International**  
**Iron & Steel Production**



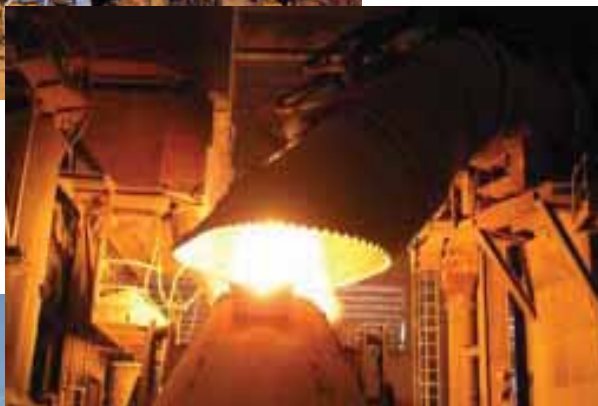
*Better Air is Our Business®* **AAF**  
INTERNATIONAL

# Air Pollution Control Solutions

## Iron and Steel Production

The iron and steel industry is a highly material and energy intensive industry. More than half of the mass input becomes outputs in the form of off-gases and solid residues. The most relevant emissions are those to air. That is why one of the most important subjects for action in response to environmental concerns is to control air emissions. At AAF, Better Air is our Business. AAF has the necessary personnel expertise, equipment, design capabilities and capital to solve problems, and to solve them on a complete turnkey basis if necessary. This service insures satisfactory overall system performance with a single responsibility AAF's solutions may range from a

completely packaged unit to solve small in-plant ventilation problems to large, complex, custom-designed systems for major gas-cleaning projects. Another important measure of AAF's air pollution control design capabilities is its depth of experience in furnishing vital auxiliary equipment. In addition to the basic gas cleaning equipment, AAF can provide supplementary engineering services, power distribution systems and processing equipment, which may be required to design a completely engineered system including noise control systems. AAF has been doing it for more than eighty years. The proof is in the hundreds of AAF air pollution control systems already in operation throughout the world.

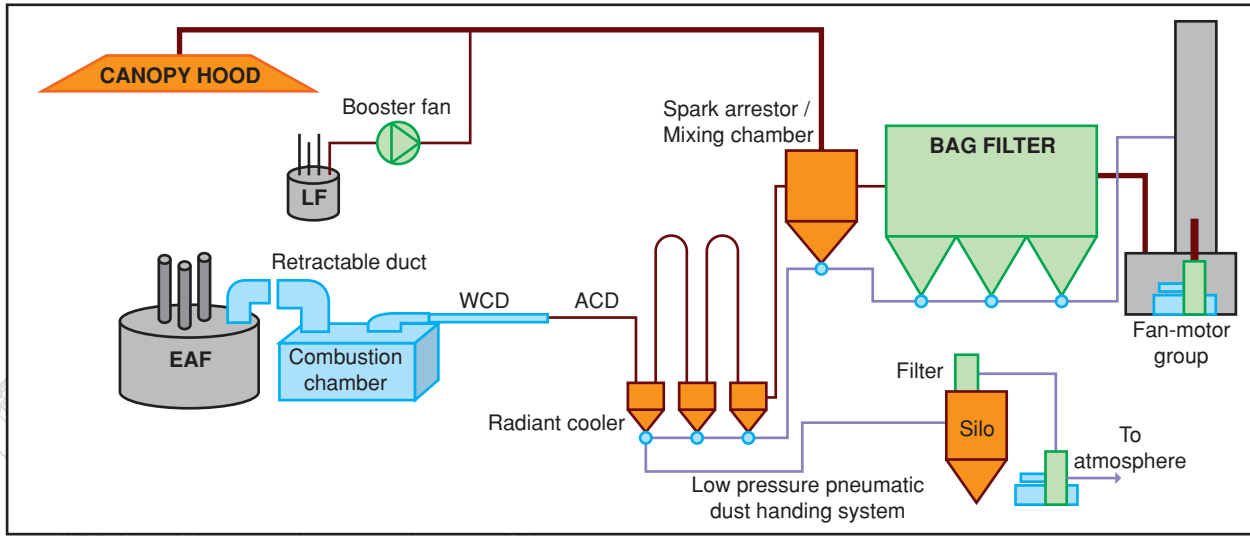


### General Applications

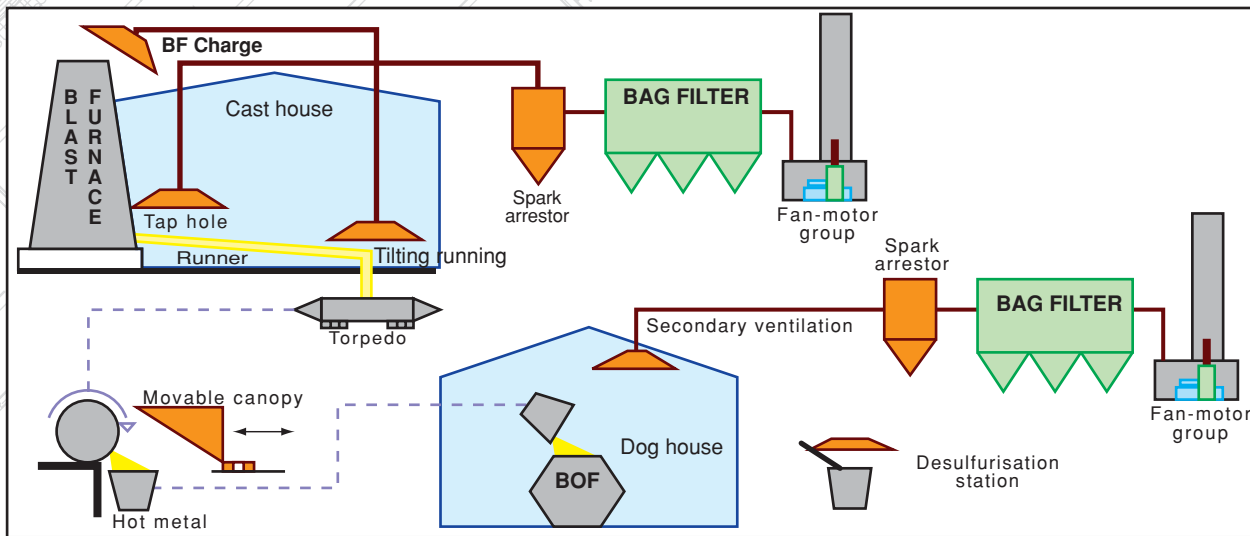
- \* Sinter plants
- \* Coke oven plants
  - Coke pushing
  - Coke charging
  - Coke handling
- \* Coal mills
- \* Blast furnaces
  - Charging
  - Tap holes
  - Runners
  - Skimmers
  - Tilting runners
- \* Iron desulfurisation
- \* BOF ventilation
- \* Hot metal transfer
- \* Electric arc furnaces
  - 4th hole system
  - Melt shop ventilation
  - Lateral exhaust hood
  - Ladle furnace
- \* AOD refining
- \* Scarfing
- \* Ferro alloy furnaces
- \* Materials handling systems

# Air Contaminant Sources in Iron and Steel Plant

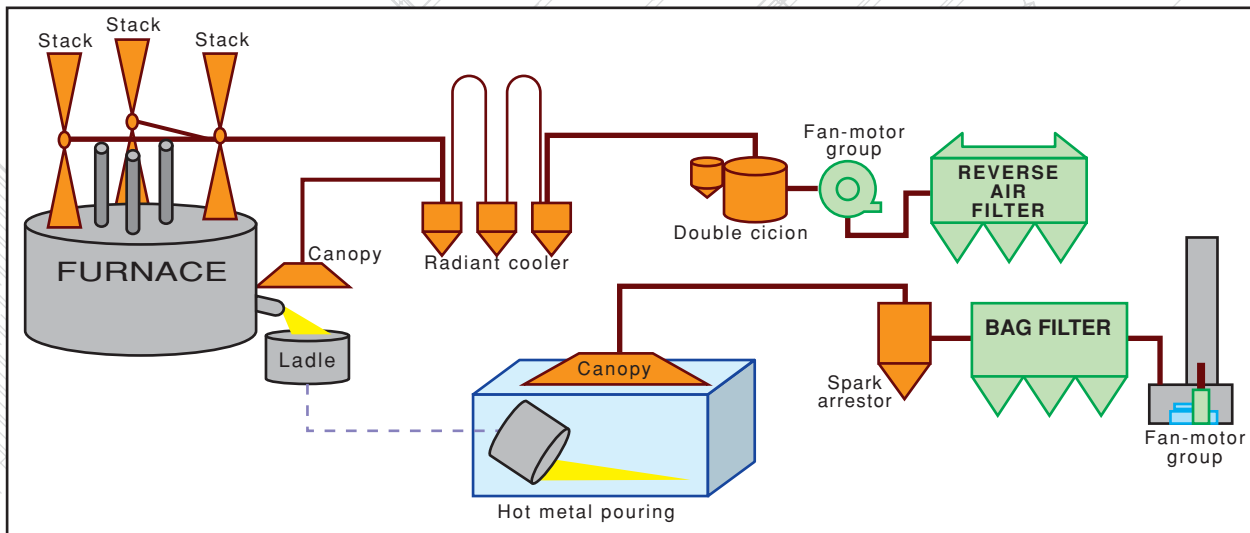
## ELECTRIC ARC FURNACE



## BLAST FURNACE AND BOF



## FERROALLOYS



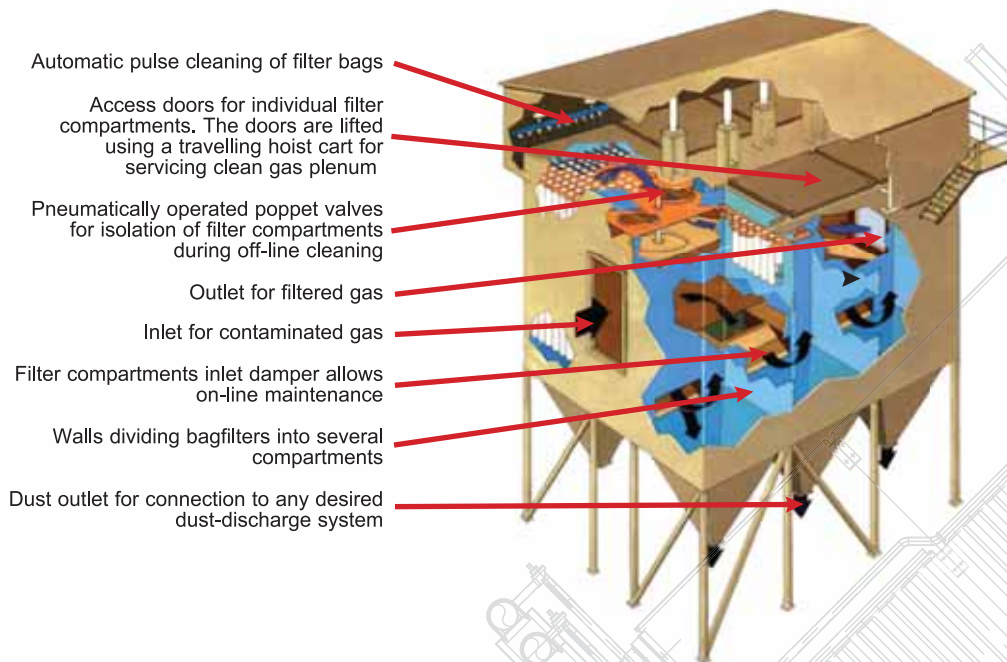
## Fabric Collectors

As air pollution standards become increasingly strict, fabric collectors are becoming the preferred type of gas cleaning equipment. They provide superior particulate control over the widest ranges of conditions and dust concentrations. AAF manufactures fabric collectors with each of today's accepted and proven cloth cleaning methods, including pulse-jet and reverse air. They are offered in a variety of configurations, such as top access, bottom access, factory assembled modular, or knocked down for assembly on the job site.

## FabriPulse XLC

The FabriPulse XLC is a pulse-cleaned fabric filter. Combined inlet and outlet manifolds, which constitute an integral part of the filter, ensure a uniform distribution of the gas and dust to the fully compartmented filter. The wall dividing the inlet and outlet manifold can be provided with a valve which serves as an extremely simple by-pass arrangement. Hence, external by-pass ducts can be eliminated. Flow through individual compartments is automatically interrupted during bag cleaning by closing pneumatically operated outlet poppet valves. In order to isolate a filter compartment to permit on-line inspection and maintenance,

dampers are also provided at the inlet of each compartment. Dust-laden gas is distributed to the filter bags from the hoppers which act as dropout chambers for the coarser particles. The gas then passes through the filter bags, which are fastened to the tube plate by snapbands. This ensures simple and positive sealing. The dust deposited on the outside of the bags is dislodged at intervals by brief sharp pulses of compressed air injected into the top of the bags. The dislodged dust falls by gravity into hoppers beneath the individual compartments and hence into the dust transport system.



## Nuisance Filter

AAF offers full range of fabric collectors from small size Fabri-Pulse filters, Model Optiflo compact cylindrical filter to medium size modular construction model Millennium. These collectors are widely used in secondary metallurgy and auxiliary processes.

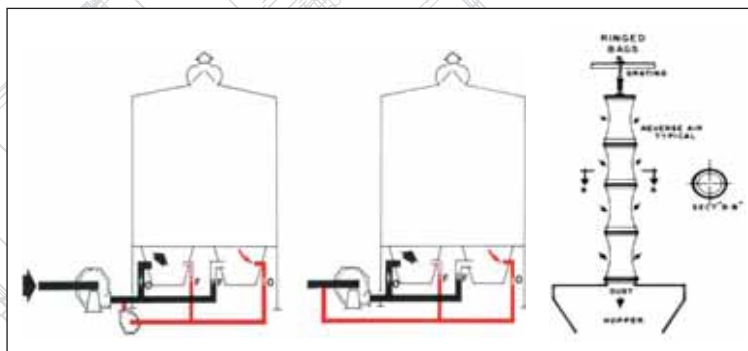


## Amer-Therm

The AAF AMERtherm employs woven fabric, tubular filter bags, open to the hoppers at the bottom and sealed to metal caps at the top. Contaminated gas enters the baghouse inlet manifold and is distributed to each hopper, from which it enters the filter bags through collars in the tube sheets (hopper tops) to which individual bags are clamped. Particulate contaminants are deposited on the inner surface of the bags as the gases pass through the media and are discharged to atmosphere. The cleaning of bags is accomplished by brief reversal of gas flow through one section of bags at a time causing the dislodged filter cake to drop into the hopper below. Air reversal is accomplished by dampering off the compartment being cleaned and opening another damper leading to a separate



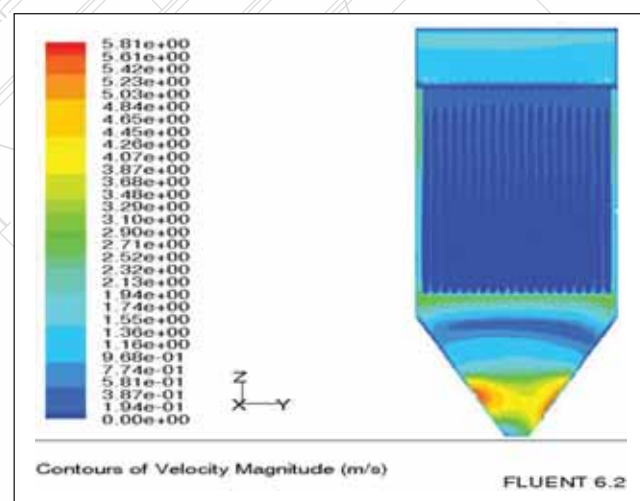
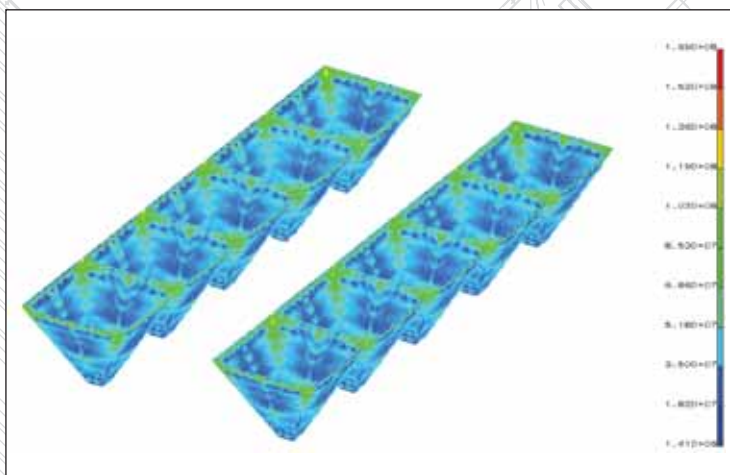
duct system connected to an auxiliary reverse air fan. The operation is repeated in turn until all compartments have been cleaned and returned to service.



Usually pressure operation is selected. Here the main fan is on the inlet side (upstream) of the baghouse requiring only that the portions of the collector in contact with contaminated gases be sealed gas-tight. The "clean side" housing may be merely weathertight. Although not usual, suction operation could be selected. Here gas-tight construction and bracing the housing for high internal negative pressures is necessary.

## Engineering Capabilities

AAF is the International leader in environmental control. No other company can match the diversity of equipment and systems AAF offers for environmental control. Whatever it takes your requirements, AAF's knowledge, experience and resources will get the job done. AAF as an industrial leader is using numerical simulation to accelerate and improve the design of its filters. Testing of the virtual prototype allows evaluating the product performance under realistic conditions.



## Auxiliary AAF Equipment

### Exhaust Hoods

The fume capture method also plays a crucial role in this particular industry. AAF can size not only stationary hoods situated above the furnace but also lateral exhaust systems if necessary. AAF also furnishes mobile or movable hoods which provide minimum interference with the process operation. These hoods are available in steel plate or water-cooled configurations



### Combustion Chambers

AAF builds a variety of combustion chambers for burning carbon monoxide and oily hydrocarbons. Water cooled walls are widely used.

Predicting heat-flux rates, water temperature rise and external channelling designs requires experience. AAF offers unmatched expertise in the design and selection of water-cooled gas handling equipment including water-cooled dampers, ducting, and the associated water cooling equipment.

### Radiant coolers



AAF is the pioneer in the wide application of radiant-convective, self-cleaning and low energy consuming loop coolers. The cooler is designed with dropout hoppers and conveyors to remove large particles carried over from the process.

### Forced air cooler

It is a gas-to-air heat exchanger where the heat of the exhaust gases is transferred to ambient air, by the use of axial fans blowing air across the cooler tubes.

### Spark arrestor

It is used to avoid sparks coming from different processes. Several designs are available.

### Fans and motors

Considerable design and selection evaluation is involved in providing the correct primary fans, volume control devices and motors for air pollution control systems. AAF examines capital cost and compares these with operating costs when selecting equipment for a specific system.

### Noise control systems

AAF has developed its own technology for getting the most accurate silencer in each situation, including fan isolation.

### Stacks

AAF has wide experience in the application of steel stacks and for gas exhausting purposes.

### Dampers

AAF offers several designs of dampers, ranging from simple plates which drop into position to poppet damper, which offers positive gas shut-off in a by-pass system or for use in compartmental isolation in large baghouses.

### Process instrumentation

Precise but practical instrumentation is most important, particularly in the more automated gas cleaning systems. AAF is staffed with experienced engineers to design and specify the needed instrumentation equipment for each type of system.

### Materials handling systems

The accumulated dust in hoppers must be removed and usually transported to a central point. Some elements are often required as, rotary valves, screw conveyors, chain conveyors... Apart from these commercial equipments, AAF has developed a low pressure pneumatic system for handling the dust to storage silos. Different methods to prevent bridging of dust in hoppers are also available.



### Room Conditioning

Special equipments compressors, could need high quality air for running. Also extra heat coming from electrical cabinets may need to be directly extracted outwards in order to avoid extra heat and dirt in control rooms. AAF engineers complete systems which allow these critical elements to work without problems.



## AAF Global Installation



Fabripulse XLC serving an EAF in France  
Flow: 310,000 m<sup>3</sup>/h



Fabripulse XLC serving an EAF in Spain.  
Flow: 1,500,000 m<sup>3</sup>/h



Fabripulse XLC serving an EAF and AOD in Spain  
Flow: 850,000 m<sup>3</sup>/h + 500,000 m<sup>3</sup>/h



Fabripulse XLC serving an iron desulphurisation in Netherlands  
Flow: 300,00 m<sup>3</sup>/h



AMERtherm serving an EAF in China  
Flow: 1,600,000 m<sup>3</sup>/h



AmerTherm serving an EAF in USA.  
Flow: 2,700,000 m<sup>3</sup>/h

# AAF International Air Pollution Control Solutions

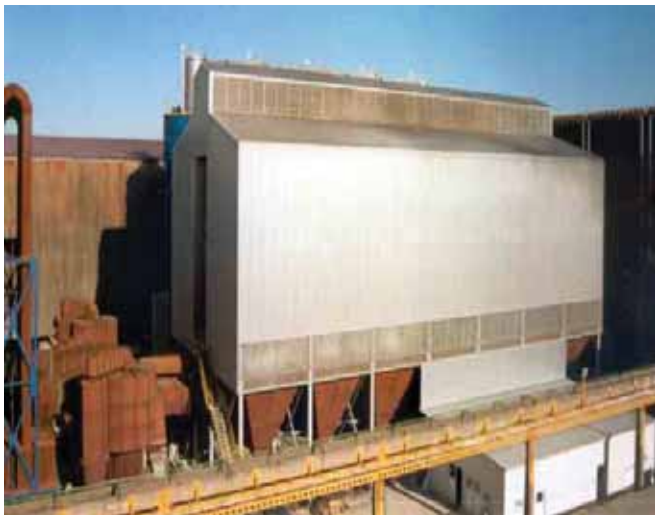
## AAF Global Installation



Fabripulse XLC serving an EAF in Spain  
Flow: 2,000,000 m<sup>3</sup>/h



Fabripulse XLC serving an EAF in France  
Flow: 1,600,000 m<sup>3</sup>/h upgrade to 2,200,000 m<sup>3</sup>/h



AMERtherm serving a ferroalloy furnace in Spain  
Flow: 950,000 m<sup>3</sup>/h + 400,000 m<sup>3</sup>/h



Fabricpulse XLC serving two BF cast houses in England  
Flow: 492,000 m<sup>3</sup>/h

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