IBAU HAMBURG
Your efficient partner for modern and effective bulk material handling

PLANT DESIGN - ENGINEERING - EPC-CONTRACTING

CEMENT - THERMAL POWER - MINERALS

Central Cone Silos
- Single silos
- Ring silos
- Multicompart ment silos
- From 2 to 22 chambers
- Diameters: 14 to 27 m.

EPC-Contracting
- Piling
- Civil works
- Steel structure
- Supply/errection
- Electrical/mechanical
- Supply and errection

Marine Cement Terminals
- Floating terminals
- Mini terminals
- Silo systems
- Dome systems
- Flat storage terminals

Silo Conversions
- Economic modifications
  with advanced cutting-edge technology

Cement Carriers
- Advanced technology for
  self-discharging
- Cement Carriers
  including the
  Midship tunnel

Components
- The key for
  a well
  functioning plant:
  Components,
  all made
  to measure

Ship Unloaders
- Stationary or mobile types
  - From the
  5,000 class
  up to the
  60,000 class

Spare Parts
- High stock
  availability
  - Just-in-time
  supply
  of spare parts
  - After-sales
  Service

IBAU HAMBURG
Dry Product Handling
for flue gas cleaning and ash removal systems
in thermal power plants

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IBAU HAMBURG
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in thermal power plants

A HAYER & BOECKER Company
Information

Dry product handling for flue gas cleaning and ash removal systems in thermal power plants

Storage and conveying solutions for dry bulk material

IBAU HAMBURG is one of the worldwide leading companies supplying storage and conveying solutions for dry bulk material produced and used in flue gas cleaning systems of thermal power plants. IBAU HAMBURG not only supplies systems and components for power plants, but also complete customised solutions for handling fly ash, pulverised limestone, quicklime and gypsum.

Main IBAU Components

- Fluidslides
- Pressure vessels
- Screw pumps
- Rotary air locks
- Jet conveyors
- Pneumatic conveying with Fpipe
- Medium pressure conveying systems
- IBAU Large-storage silos
- Steel silos with aerated bottom
- Bulk loading systems for pressure vessel trucks, rail wagons and ships
- Discharge systems for pressure vessel trucks, rail wagons and ships
- Wet ash loading systems

Silo, storag, loading technology:

- IBAU HAMBURG finds the best economical and technical solution for the fly ash removal system, the storage silo system and the loading facilities by taking important layout data into consideration.

Fly ash removal systems:

Depending on the ESP-height and the distance to the storage facility, IBAU HAMBURG is able to choose between several different technical solutions.

Fly ash handling for coal-fired Power Plants

The fly ash is separated from the flue gas by ESPs or fabric filters. IBAU HAMBURG finds the best economical and technical solution for the fly ash removal system, the storage silo system and the loading facilities by taking important layout data into consideration.

Fly ash removal system with Fluidslides

The fly ash is fed from each filter hopper by rotary feeders or pendulum flap valves to Fluidslides. The fly ash is conveyed by these Fluidslides to an intermediate bin from where the ash is transported pneumatically either by IBAU Pumps or pressure vessels to the storage silo. These systems are very economical thanks to the low energy consumption and also 100% reliable in service.

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Fly ash removal system with multi-pressure vessel system

Under each hopper of the ESP, a pressure vessel is installed picking up the fly ash. In case the vessel of a group of vessels is full, the group of vessels in one row is emptied simultaneously.

Pressure vessel conveyors:
Pressure vessels function according to the dense-phase flow principle with low conveying velocities of the material. Several vessels are connected to one conveying line. For different conveying quantities different pressure vessel sizes can be combined. The energy consumption is relatively low.

A multi-pressure vessel system is the ideal solution in case of a low height underneath the ESP hoppers and a long conveying distance to the storage silo.

Low material velocities inside the conveying pipe will cause low abrasion.

Pneumatic fly ash conveying system with IBAU Pressure vessels

Pneumatic conveying of FGD-Product by pressure vessels
Dry product handling for flue gas cleaning and ash removal systems in thermal power plants

**Fly ash removal system with IBAU Fpipe**

The fly ash is fed from each filter hopper by rotary feeders to the Fpipe. The Fpipe conveys the fly ash either to the storage silo or to an intermediate bin in case there is a greater distance to the silo. The advantage of this system is a low height of the ESP and a low energy consumption.

**Material transport via IBAU Fpipe**

So far, there are mostly two methods set for the pneumatic transport: the energetically favourable fluidslide transport and the flexible pneumatic transport through conveying pipes.

The new Fpipe methods combine the advantages of both conveying systems and eliminate the disadvantages of e.g. the downward fluidslide slope at the fluidslide transport or the relatively high energy consumption for a conventional pneumatic conveying system.

With the Fpipe method, the material is conveyed in a dense flow with conveying speeds of 3-10 m/s. In order to avoid plug forming in the conveying line, the material is fluidised in the conveying line just as it is done in a fluidslide system. The system allows a conveying capacity of up to 400 t/h with an air speed of 3 m/s at the beginning of the conveying line.

The conveying air is being reduced by factor 2 in comparison to a lean-phase conveying as well as the pressure loss in the conveying line and the energy consumption for the conveying.

**Advantages**
- Flexible pipe routing
- Horizontal and vertical conveying
- Dust-tight
- Low conveying velocities
- Low wear / abrasion
- Low energy consumption
Fly ash storage silos:
Depending on the required storage capacity, IBAU HAMBURG chooses the best technical and economical silo system. IBAU HAMBURG supplies pneumatic systems for the storage of fly ash, pulverised limestone, burnt lime, hydrated lime and FGD-products at power plants. They function according to the 'first-in/first-out' principle. Lower capacities of up to approx. 2,500 t, usually are stored in steel silos.

IBAU Central cone silos: These silos have proven their worth time and again and are the industrial standard for storage volumes of up to 30,000 m³. They are equipped with a pneumatic discharge bottom and provide for metered and maintenance-free material discharge.

The advantages of this silo system are:
- Less concrete works
- Cost and time saving by using prefabricated cone elements
- Less energy consumption
- Emptying rate of up to 99%
- Less maintenance works
- Trouble-free operation
Dry product handling for flue gas cleaning and ash removal systems in thermal power plants
Dry product handling for flue gas cleaning and ash removal systems in thermal power plants

**Fly ash loading systems:**

The loading system can be stationary or mobile. IBAU offers a wide variety of fly ash loading systems. The fly ash can be loaded dry into truck vessels, rail wagons or ships.

The wet ash loading system consists of a humidifier and a downstream arranged open type loading chute for dispatching the material onto open trucks, open railway wagons or ships.

IBAU has delivered such loading systems for Gemeinschaftskraftwerk Mannheim, RWE, E.ON, Austrian Energy and many other customers in the Power Plant Industry.

These loading systems allow the Power Plant customers to distribute the fly ash to further markets and to reduce the deposit of a valuable by-product.

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**Ship loading systems**

Bulk material such as fly ash, gypsum or FGD product can be loaded directly onto ships by means of pneumatic conveying systems. This technical solution requires separate dedusting equipment on the ships.

Higher loading capacities will be reached special ship loading chutes. The bulk material will be stored in a separate bin, which will be discharged pneumatically by airslides. A loading chute at the end of the airslide charges the ship with the bulk material.

Ship loading systems can either be moveable or stationary.
Dry product handling for flue gas cleaning and ash removal systems in thermal power plants

Pulverised lime-stone, burnt lime and hydrated lime handling for dry and wet FGD Plants

IBAU HAMBURG supplies the material handling system for dry and wet FGD plants including unloading from rail wagons, trucks or ships, the silo storage and the dosing system to the slurry tanks.

Unloading systems:
The Lime is unloaded from trucks, rail wagons or ships.
The unloading capacity can be increased by installing a separate conveying air compressor.
Dry product handling for flue gas cleaning
and ash removal systems in thermal power plants

IBAU HAMBURG is one of the worldwide leading suppliers for storage and conveying systems for dry FGD plants for coal-fired, biomass and waste-fired power plants.

Bulk materials, such as hydrated lime and FGD product, require a special treatment due to their special characteristics.

IBAU HAMBURG provides the perfect technical solution to guarantee a troublefree operation.

Storage and conveying systems for dry FGD plants

The dry FGD product is recirculated back from the bag filter hoppers to the scrubber while a certain percentage of the FGD product is discharged and fed into the storage silos.

Some of the burnt lime is hydrated and the hydrated lime then fed to the scrubber.

Feeding system of hydrated lime into the flue gas scrubber

Silo discharge and dosing system to slurry tanks:

The pulverised lime stone or hydrated lime is discharged from the silo and dosed volumetrically by rotary feeders or screw conveyors into the slurry tank.

The accuracy can be improved by using special flow meters such as weigh feeders or solid flow meters.

The density of the suspension inside the slurry tank is measured. In case a certain density is reached, the dosing process is stopped and the suspension of water and lime is fed into the scrubber.

Dosing system to a slurry tank by weigh feeders
Dry product handling for flue gas cleaning and ash removal systems in thermal power plants

Recirculation
The dry FGD product includes a high amount of hydrated lime which has not yet reacted with the sulphur dioxide. Therefore, the product from the filter discharge is recirculated back to the scrubber in order to reduce the consumption of hydrated lime. A certain percentage of the product is discharged and conveyed pneumatically to the FGD product silos.
Highly qualified service and maintenance personnel

Maintenance
Components and systems perform best when they are in ideal operating conditions.

Our supervisors are aware of the sensitive points and mechanical details of our equipment.

In order to keep your equipment in best condition, we recommend frequent inspections by IBAU HAMBURG site technicians, and the appropriate preventive maintenance:
- Visual inspection
- Functional testing
- Optimum adjustment of process parameters

Supervision
After system equipment has been delivered by IBAU HAMBURG, our specialists travel to the plant site in order to perform the relevant plant services.

Commissioning is the process of ensuring that our systems are installed, functionally tested and operated in conformance with the design. A system that has not been properly commissioned often causes problems later on. Our skilled engineers are experienced in providing commissioning and supervision services for new as well as existing systems. We can be on site during configuration and test, start-up, operation, shutdowns, trouble shooting and maintenance.

Installation of an IBAU Mixer

Adjustment of the settings
Highly qualified service and maintenance personnel

BAU – Warehouse and assembly shop on more than 5,000 sqm, pre-assembled components and spare parts for fast delivery – the real just-in-time solution