# IBAU HAMBURG

Your efficient partner for modern and effective bulk material handling

PLANT DESIGN - ENGINEERING - EPC-CONTRACTING

## CEMENT - THERMAL POWER - MINERALS

**Central Cone Silos**

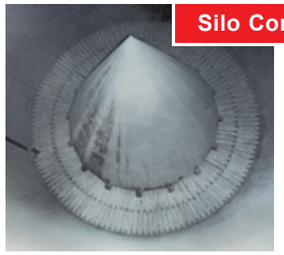
Single silos. Ring silos. Multicompartment silos. From 2 to 22 chambers, diameters: 14 to 27 m.

**EPC-Contracting**

Piling. Civil works. Steel structure, supply/erection. Electrical/ mechanical supply and erection.

**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.

☏ + 49 (0) 40 36 13 090

www.ibauhamburg.de

info@ibauhamburg.de

Z/12/15/Activities/Engl.

# Activities

**Plant Design. Engineering. EPC-Contracting.**

**From the first sketch to commissioning and maintenance: Effective. Efficient.**

# IBAU HAMBURG

A HAVER & BOECKER Company

**IBAU HAMBURG Bulk handling: Storing, Conveying and Transport of all dry powdered bulk materials**

# We offer what you need: Individual economic solutions. All made to measure

IBAU HAMBURG is situated right in the center of the City of Hamburg, and with giant warehouses on more than 5.000 sqm in Hamburg-Allermöhe.

## Always state-of-the-art: We bring your best ideas to life

We supply worldwide proven advanced Silo Technology and economic Silo Systems, Silo Conversions, Terminals, Carriers, Ship Unloaders, all relevant Components and a Spare Part Service just-in-time.

Also Plant Design with complete Engineering and EPC-Contracting, Supply and Erection, Technical Supervision of Pilling, Civil Works, Steel Structure and Electrical and Mechanical Works.

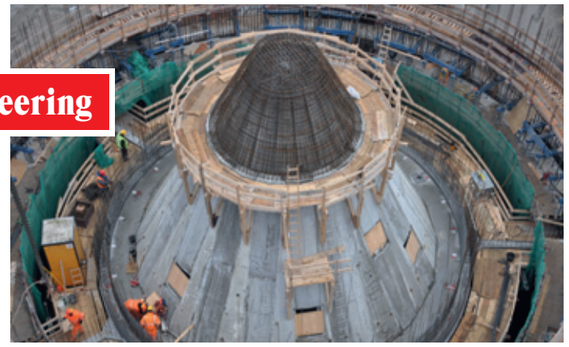
We have one principle: To find always appropriate high quality customer oriented solutions. We renew and improve all processes and products continually.

With our excellence programm we integrate every new idea and we make it immediately fit for production: Always in close contact with our customers.

## Effective. Efficient: Quality, made in Hamburg, Germany

**Plant Design** p. 4/5

**Engineering** p. 6/7



**EPC-Contracting** p. 8/9

**Cement** p. 10/13

- Raw Meal Silos
- Cement Silos
- Multicompartment Silos
- Silo Conversions
- Terminals
- Cement Carriers
- Ship Unloaders
- Components

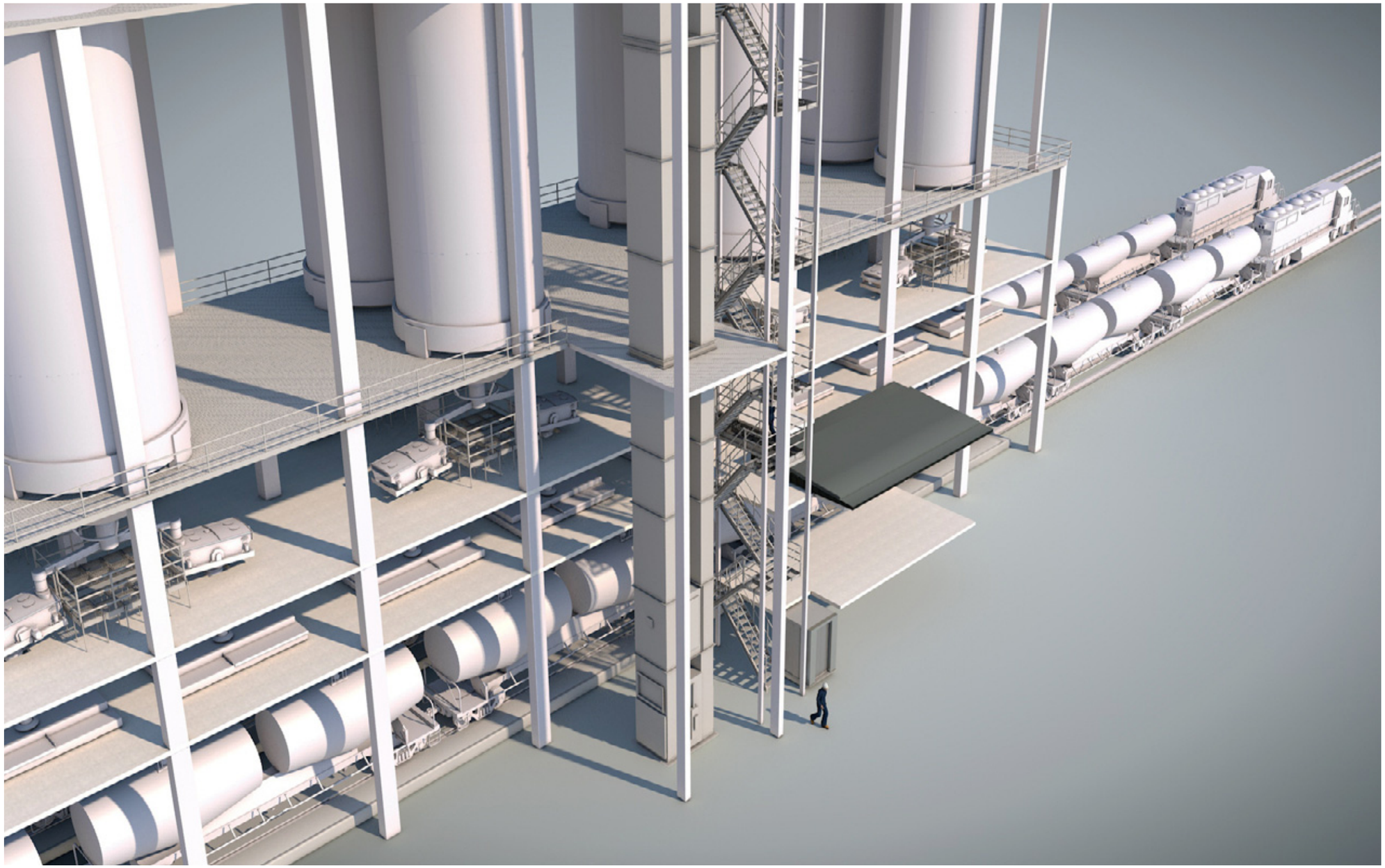
**Thermal Power** p. 14/17

- Fly Ash Silos
- Limestone Silos
- Silo Conversions
- Conveying Systems
- FGD Product Handling
- Dried Gypsum Handling
- Ship Unloaders
- Components

**Minerals** p. 18/19

- Alumina Silos
- Silo Conversions
- Conveying Systems
- Loading Stations
- In-Plant Storage
- In-Plant Conveying
- Ship Unloaders
- Components

## We balance visions and economy: From the first sketch to commissioning and maintenance



Design of a new Railway Bulk Loading Terminal in accordance with the customer's requirements

### Plant Design with IBAU HAMBURG, based on experience by land and sea, in wet, hot and cold climates.

We offer only the relevant:

- Ingenuity
- Engineering,
- Turnkey solutions.
- With references in all kinds of land and marine applications.

Many years of experience help us to support our customers in implementing their projects by developing and applying customised systems and concepts of the highest quality.

### Cutting-edge-technology.

### Proven by time and reality: For every detail, for all key elements, big or small.

## With IBAU HAMBURG you are always in good company!

Proven in all conditions: IBAU Multicompartment cone silos

### IBAU HAMBURG is an engineering company, well known as the inventor of the ORIGINAL CENTRAL CONE SILO

This was in 1975 the most important step towards the modern silo and mixing technologies.

Consequently all the major suppliers have adopted this system.

More than 13.000 IBAU Silos of this type are working successfully worldwide.

As an innovative company, IBAU HAMBURG continually develops its products and components and undergoes continuous quality improvements:

**Economic.
Effective. Efficient.**

IBAU HAMBURG is certified with
ISO 9001,
ISO BS OHSAS 18001,
ISO SCC

Good engineering means: Permanent quality control and trouble-free operation

## One example in Sweden: A 90 m Multicompartment Silo, erected in 18 months, completed without any delay or accident


One of the worlds largest Multicompartment silo (Diameter 26 m, 90 m high) for Cementa A.B / Heidelberg Cement Group

### EPC-Contracting: Cement terminal for Cementa AB, Malmö, Sweden

The EPC-Contract, including

- piling,
- civil works,
- steel structure supply and erection as well as
- electrical and mechanical supply and erection has been successfully commissioned in November 2011 without any delays.

IBAU HAMBURG successfully completed the 18 months construction and commissioning phase without any accidents.

The Cementa own ships can discharge at the terminal with up to 1,000 t/h.

The cement is fed to a multicompartment storage silo, which has a height of 90 metres, a diameter of 26 metres, consisting of 6 chambers with a total capacity of 30,000 tonnes.

The distribution takes place via three combined truck/wagon loading lanes, each with a capacity of 250 t/h.

The whole Terminal can be operated 365 days/year and 24 hrs/day fully automatically.

Civil works

Steel construction

Mechanical erection

## Raw Meal Silos, Cement Silos and Multicompartment Silos, Cement Terminals, Cement Carriers, Ship Unloaders, Components

### The ORIGINAL CENTRAL CONE SILO

is in many different varieties – the most efficient silo for storage and dispatch of cement.

The design is mainly used for large storage silos in the cement industry and other mineral industries for cement, raw meal, fly ash, ground granulated blast furnace slag, alumina and similar products.

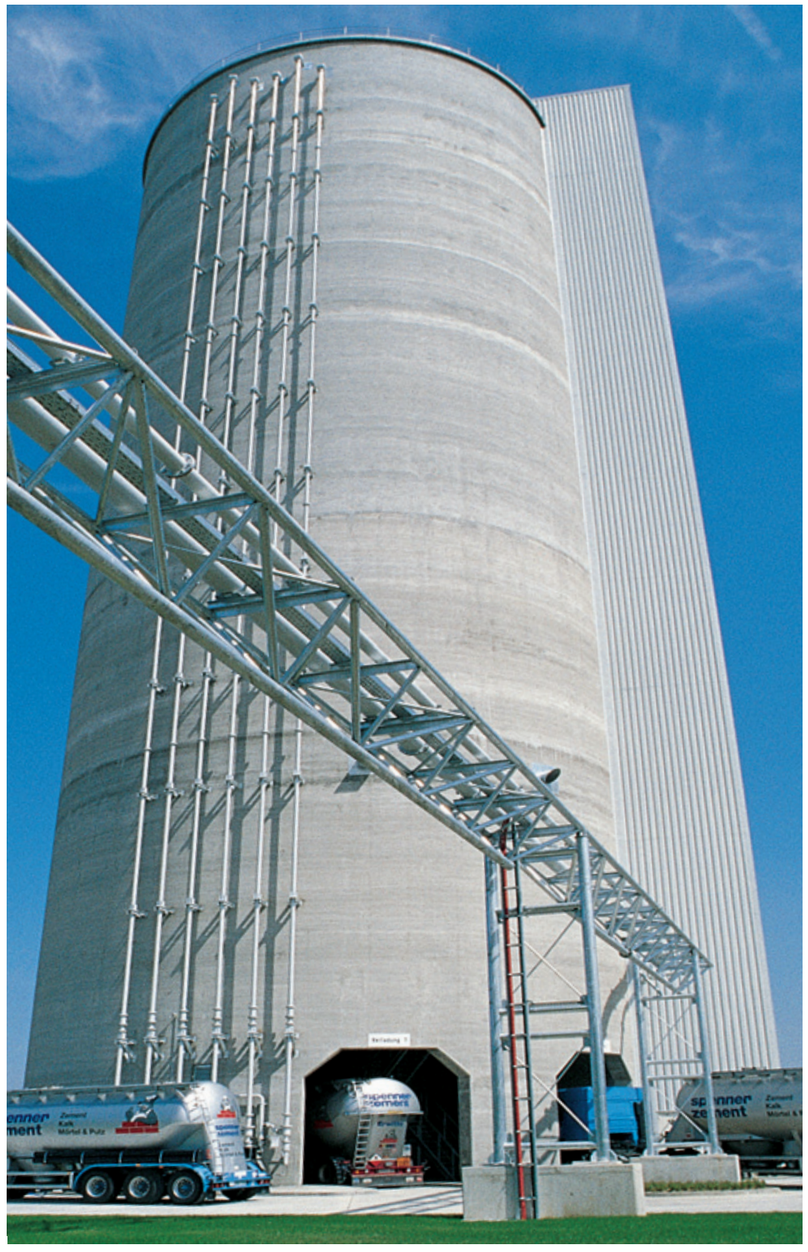
Storage silos for these products have diameters of 10 m to 30 m and even more with storage capacities up to 40,000 t and they require an efficient and trouble-free emptying.

The IBAU Central cone silo has proven to be extraordinarily successful. Today, more than 7,000 units are in operation by various customers around the world.

In the original IBAU design for large silos, the central cone forms a ring space on the silo bottom. This is divided into individual aeration sections that are slightly turned towards the discharge openings in the cone with a small inclination.

The central cone is used to accommodate the necessary machinery and equipment such as:

- Blowers,
- Filters,
- Electric control boards,
- Compressors,
- IBAU Pumps, etc.



Multicompartment silo with 15 compartments for Spenner Zement

Silo Plant CCB Gaurain, Belgium

Cement Australia Railton, Tasmania, Australia

TPI Polene Cement Plant, Saraburi, Thailand

Raw meal blending silo for Dyckerhoff Zement

Cement storage silo for Cement Australia

# Clean, economic and erected in midtown Paris: A new exemplary silo construction from the new generation


IBAU's newest Multicompartment silo in Paris/France built for Ciments Calcia/Semapa

View of the silo plant next to the "Périphérique"

Railcar unloading station

Railcar unloading

Material distribution on the top of the silo


Truck loading station

# Fly Ash silos, FGD-Product- and Dried Gypsum handling, Loading-, Conveying- and Feeding systems, Ship loaders and -unloaders, Components

## 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.

## IBAU Components

Pneumatic conveying installations:

- Fluidslides
- Pressure vessels
- Screw pumps
- Rotary air locks
- Jet conveyors
- Pneumatic conveying with Fpipe
- Medium pressure conveying systems

## Silo-, Storage-, Loading technology:

- 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

GKM Mannheim, Germany, Limestone and fly ash storage silos, including ship loader

Conveying systems for Alstom PPC Florina, Greece

Limestone storage silo for ENBW Karlsruhe, Germany

RWE STKW Hamm, Germany, Fly ash limestone storage silos including truck and wagon loading stations

Fly ash processing, Castle Peak B, Hongkong

RWE Fly ash storage silos, Eemshaven, Netherlands

## FGD-Product and Dried Gypsum handling, Loading-, Conveying- and Feeding systems,

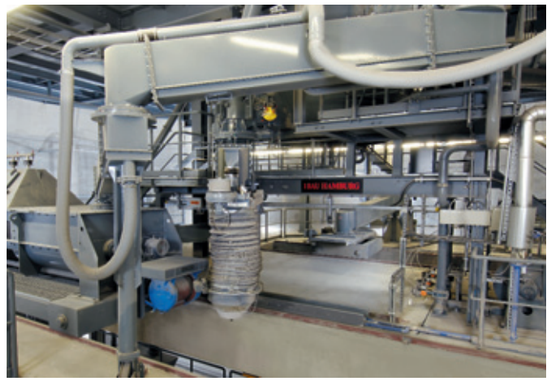
IBAU F-pipe for a fly ash removal system of an ESP

Fly ash conveying system with IBAU Pressure vessels

Feeding system of hydrated lime into the flue gas scrubber

## Ship loaders and -unloaders, Components

Mobile truck loading system for dry fly ash



Combined dry ash and movable wet ash loading system

Ship loading for dry fly ash

Loading system for wet fly ash with humidifier

Unloading station for trucks

Pneumatic fly ash conveying system with pressure vessels

Pneumatic silo feeding systems for fly ash silos

## Alumina Silos, Loading Stations, Loading- and Conveying- and Feeding systems, In-Plant Storage, Ship unloaders, Components

### Bulk material handling at aluminium smelter plants

IBAU HAMBURG has proven itself to be a competent partner who offers the relevant technological expertise, advanced international experience and cutting-edge technology for such plants.

As the base materials for molten-salt electrolysis fresh alumina (Al2O3) is required as well as aluminium fluoride (AlF6) and cryolite (Na3AlF6) as the fluxing agent.

Approx. 1.9 kg of alumina is necessary for 1 kg of primary aluminium. Accordingly, a 0.6 Mta plant uses approx. 1.15 Mta (million tonnes/annum) Al2O3 and approx. 0.01 Mta of the additive AlF6. Al2O3 is delivered by rail or ship.

Transport by sea is generally via Handymax and Panamax ships with a capacity of up to 80,000 t.

The most important steps for bulk material handling include:

- unloading of ships or railway wagons
- mechanical or pneumatic material transport
- silo storage and loading equipment.


Alumina storage silos for Qatalum, Qatar

Material distribution via two-way valves into silos

Alumina silos with conveying systems and loading stations

Central cone in segmental design

Silo floor with steel cone and central outlet

Road-mobile ship unloader with pneumatic conveying unit

Truck loading equipment with IBAU Simplex loader

# Terminals and marine cement terminals: Special solutions for special requirements

## Floating terminals, Mobile mini terminals, Silo plants, Dome systems, Flat storage systems

There is no terminal design applicable to all situations. Each concept has its advantages and disadvantages, which have to be weighed carefully against one another.

First of all it is necessary to consider the question of the anticipated service life.

- For a rapidly available, shortterm utilisation of only a few months the **floating terminal** is the most suitable technical solution.
- For medium – to longterm use with low handling capacities a **mobile mini terminal** can be advantageous.
- For medium – to longterm concepts with high handling capacities traditional **silo plants, dome systems** and **flat storage systems** come into consideration.

Each design can integrate mechanical and pneumatic equipment.

The best options have to be selected by knowing individual customer requirements and evaluating the specific handling costs per tonne of cement.


Cement Terminal for Cemex Maritima, Mexico


Cement carrier during loading at the Brunsbüttel terminal, Holcim, Germany

Dome silo station at Lehigh Cement Company, USA

Loading station for Civil and Marine Slag Cement, UK


Steel silos for Sacima, Port of Longoni, Mayotte, France

Cement Terminal for Golden Bay Cement, New Zealand


Silos and ship unloaders at Jurong Port, Singapore

# Self-unloading cement carriers: Fully automated high loading/unloading rates with the efficient I BAU Midship tunnel system

## The I BAU Midship tunnel concept:

The trade of cement and similar products results in new ship capacities and more and more conversions of conventional bulk carriers into specialized cement self-unloaders.

Self-unloading cement carriers need no shore based ship unloading equipment and have a totally enclosed cargo handling system, using a fluidizing system in the cargo holds for cement unloading.

## Cost reductions: Cargo holds with fluidisation systems and I BAU Pumps:

Up to now, the world fleet comprises about 300 units between 1,000 dwt and 60,000 dwt for seaborne cement transportation. Additionally, about 200 units exist in the <1,000 dwt range for lake and river transport.

In line with the market demand, IBAU HAMBURG has developed concepts for new ships as well as the conversion of bulk carriers into cement self-unloaders, which can be adapted for ship sizes up to 60,000 dwt.

Especially the cement carriers in the upper range require advanced systems, which are fully automated allowing to achieve high loading and unloading rates.

Export terminal and the carrier GOLIATH, Portland Cement, Australia

M.V. KORALIA cement carrier

M.V. KEDAH III during voyage

M.V. CEMSEA and M.V. CEMSTAR

The cement barge reaching the unloading station

M.V. KEDAH I, Cement supply on the open sea

The IBAU Midship tunnel with the IBAU Pump

# Saving time and costs of energy with the smart screw conveyor technology

## Example 5.000 dwt class: Ready for operation in 30 minutes

**1** Road-mobile ship unloader in transport position. **2** Stabilization of the unit with outrigger and support jacks.
**3** Moving the loading screw into the loading position, Supporting the loading screw on the landside outriggers.
**4** Ready for operation.

## Highly efficient ship unloading technology: 5.000 dwt class 15.000 dwt class 60.000 dwt class

Since the 90s our company is one of the most important suppliers of ship unloaders for the cement industry.

In addition, we took advantage of the decision to develop mechanical ship unloaders by applying the screw conveyor principle.

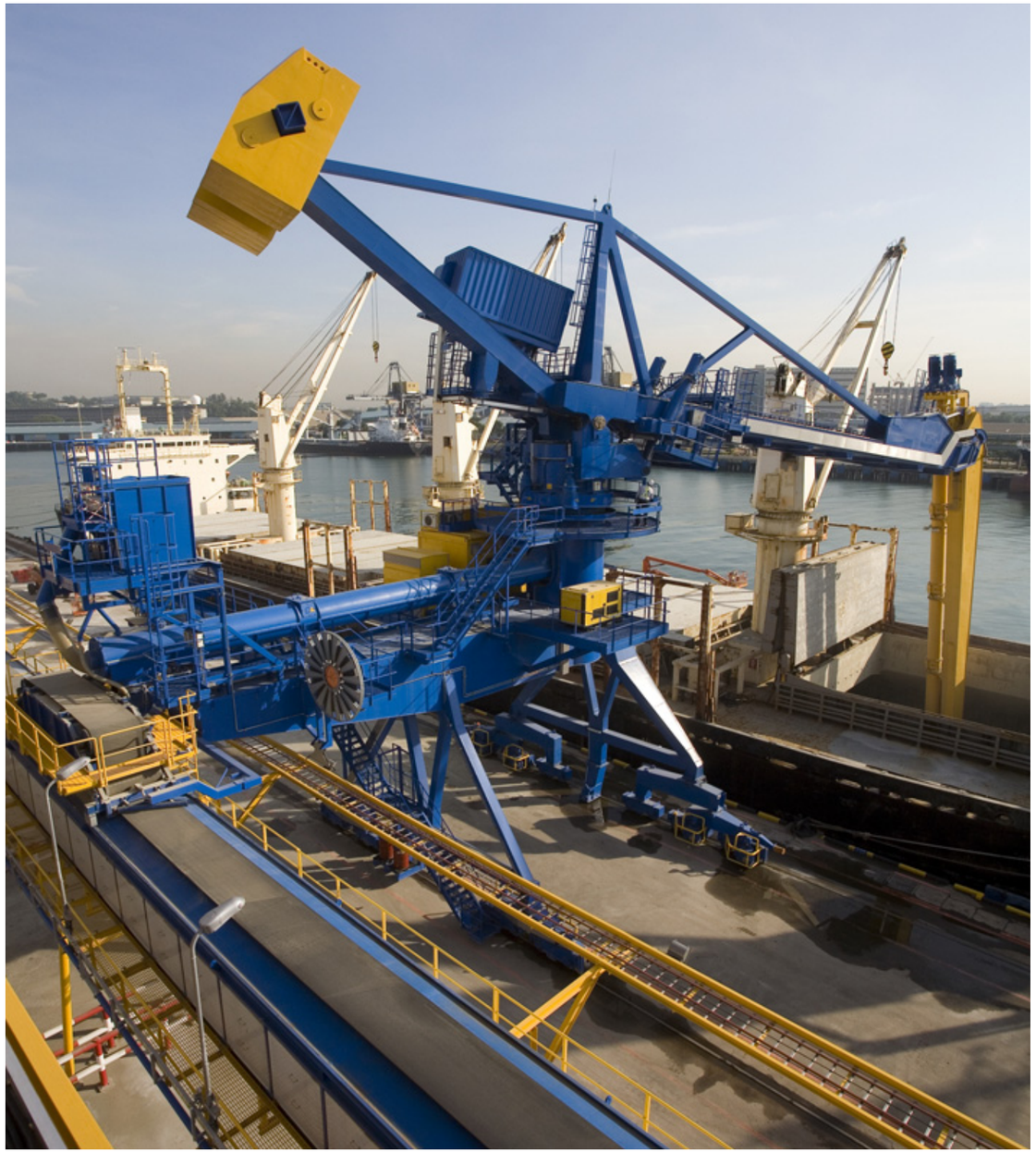
Therefore, in comparison to the vacuum systems, 60 to 65 % of energy for the cement unloading is saved. According to the size of the ship and the terminal conditions, the following ship unloaders can be used:

- **up to 5.000 dwt** and 300 t/h unloading capacity,
- **up to 15.000 dwt** and 400 t/h unloading capacity,
- **up to 60.000 dwt** and 800 t/h unloading capacity.

Self-supporting constructions are used for the capacity class up to 15.000 dwt. Supporting structures are needed for ship unloaders of the Handymax class with 20 m long unloading arms. The weight of ship unloaders installed on trailers is about 30 t, while bigger ship unloaders for Handymax ships weigh several hundred tons.


High-capacity ship unloader with on-board pneumatic equipment

## IBAU Ship unloaders: Flexible solutions – Port-mobile or stationary, from 5.000 dwt. up to 60.000 dwt.



IBAU Ship unloader for Jurong Port/Singapore

Port-mobile ship unloader for Tong Yang Cement Corp., Korea

Stationary ship unloader at Bamberg Harbour, Germany

Port-mobile ship unloader for Colacem, Savona, Italy

Rail-mounted ship unloader for Decirom, Romania

Ship unloader on rubber tyres for Continental Florida

Port-mobile ship unloader on rubber tyres for Ceminter, Spain

## Quality, made to measure, for trouble-free operations

### Selection of IBAU HAMBURG key components.

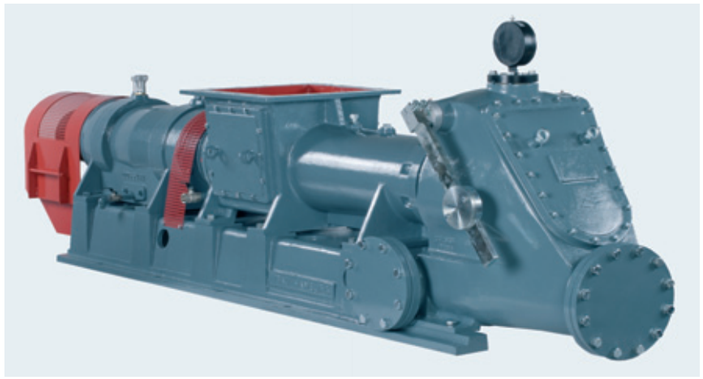
Components engineered by IBAU HAMBURG in connection with the IBAU plant engineering are the key for a well functioning plant.

Our scope of supply includes the planning of complex plants up to the development and construction of single components such as the

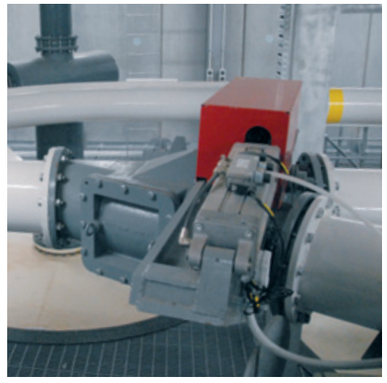
- Screw-type Pump
- Mixer
- Flow-control gate
- Cut-off gate
- Simplex loader
- Loading chute
- Lump crusher
- Roller-type discharger
- Jet conveyor
- Two-way valve
- Airlift

As an innovative company, IBAU HAMBURG continually develops its products and components and undergoes continuous quality improvements.

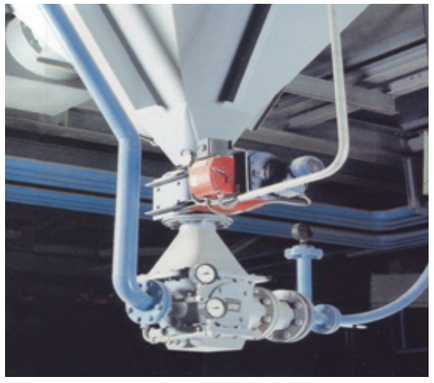

Bulk loading with IBAU Simplex loader and IBAU Loading chute

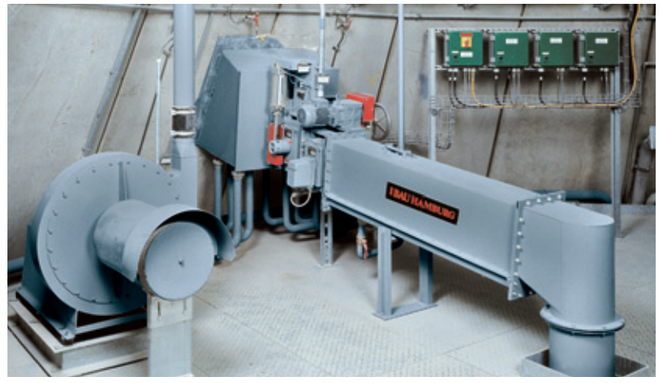
The original IBAU Pump: The screw-type pump with decisive adventages



Two-way valve in a conveying line



The IBAU Jet conveyor for spillage return




Silo discharge with motor-actuated IBAU Flow-control gate

View from inside the silo to the lump crusher

Silo feeding via roller-type bottom discharger

Airlift station

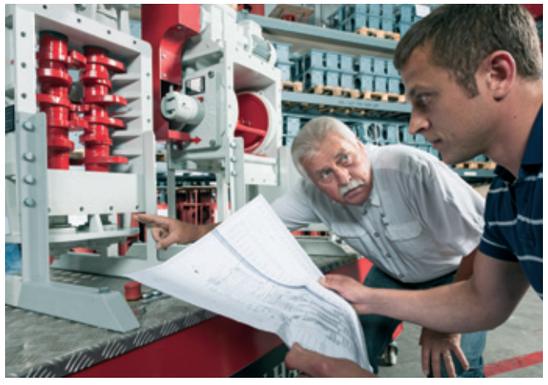
Functional test of an IBAU Flow-through mixer type IB-DM

IBAU Batch-type Mixer type IB-M

## In our giant warhouses: Spare parts, Dispatch, Technical customer service, Training center and 24-hour-Hotline

High stock availability of more than 75% for all necessary spare parts and components ...


... Most of the components are collated in the IBAU HAMBURG warehouse prior to dispatch.



In our training centre we can teach your personnel how to operate and maintain ...

... the equipment in a safer way and vastly improve the efficiency and reliability.

The 24-hour Hotline Service of our Technical Customer Service is always manned by qualified specialists 365 days ...

... a year, and they can be reached anywhere in the world at the following telephone number: +49 (0)2522-30-371