

One Source

# MÖLLER Technology in Power Plants



© VATTENFALL

# Pneumatic transport and storage systems for power plants

## We provide you with:

- **Equipment for transporting and storing dry bulk materials, e.g for fly ash, boiler ash, or limestone powder.**
- **Ash removal and fly ash handling systems**
- **Equipment for silos of all sizes and design for ash and limestone powder**
- **Loading systems for trucks, rail or ship**
- **Dry loading and loading for wet materials**
- **Unloading systems**
- **Air compressors, dryer, filter systems, and other machine technology**
- **The necessary steelwork, pipe routing, and pipework**
- **MCCs, PLCs, visualisation and cabling**

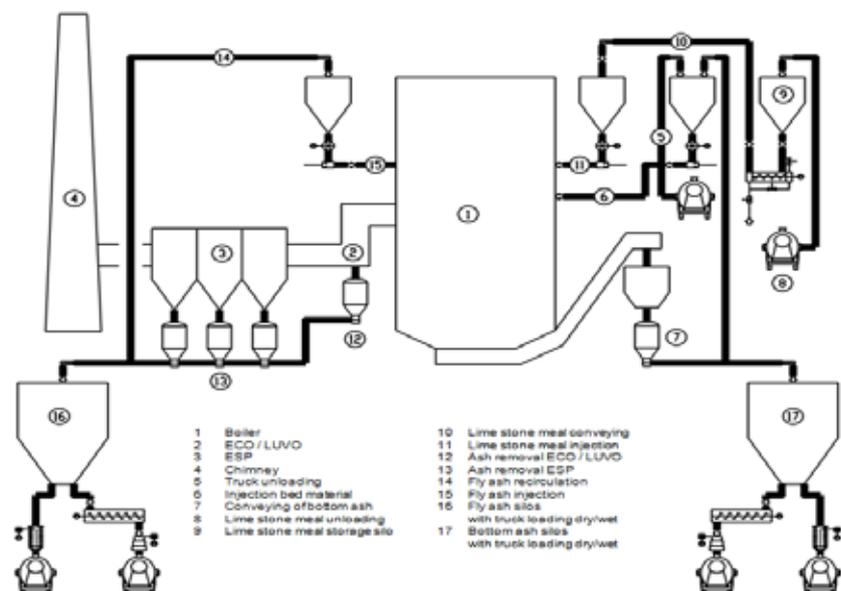
Under the brand name MÖLLER®, FLSmidth® provides all the equipment which you need in the area of pneumatic conveying and silo technology for your solid fuel fired power station. This includes power stations fired by both - hard and brown coal, as well as biomass and waste incineration power stations.

Our range of services starts already at the planning and consultancy stage, so that together with you we can define the most economical solution for your application. In the implementation, you receive design, equipment supply,

control technology, installation, commissioning, and service of the plants, all from a single source.

Our scope of supply also includes service contracts for long term operation, problem-free and economical operation.

We are at your disposal with a wide range of adaptable systems and customer-specific, tailor-made solutions.



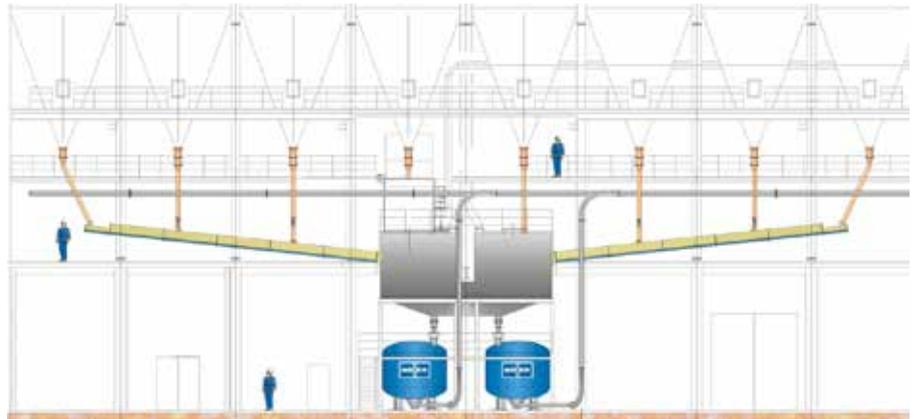
The equipment for a fluidised bed boiler shows a large part of the range of products and services

### Ash removal and fly ash handling systems

With the MÖLLER® ash removal systems for eco, air pre-heater, air heater and electrostatic precipitator or bag filters, we ensure problem-free direct transport of the ash to the silos. For this, various equipment and system types may be selected.

Permanently new developments help you to fulfil the increased demands of constructional engineering or environmental technology.

We provide the conveying systems installed underneath the filter hopper in many useful technical variations which fulfil your requirements as per the specifications.



Ash removal system



Ash removal system



Ash removal system

## TURBUFLOW® transport system

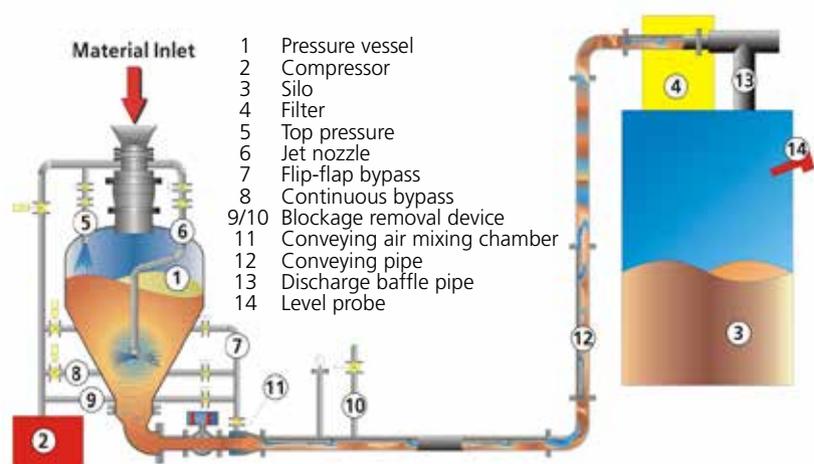
The patented MÖLLER TURBUFLOW® dense phase transport system, with maximum availability and minimum energy consumption, represents the very best solution for transport to the silos. The basis for this is always a pressure vessel system, whether as a single vessel option, double vessel system, or a MÖLLER Multi-TURBUFLOW transport system in which a group of pressure vessels works simultaneously at one conveying line.

### Functioning of the TURBUFLOW transport system

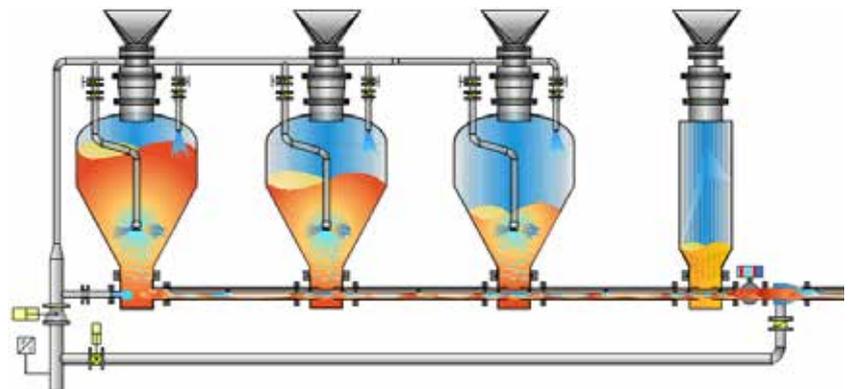
This patented pneumatic conveying system is especially well suited to fine-grained bulk materials, and has further decisive benefits in addition to the low energy consumption. The system is characterised by the fact that the conveying pipe is fitted with a secondary inner pipe whose special design provides process technology advantages compared with conventional piping.

Because of the operational reliability and very low operating and maintenance costs, the TURBUFLOW transport system is one of the most economical systems using pneumatic conveying technology.

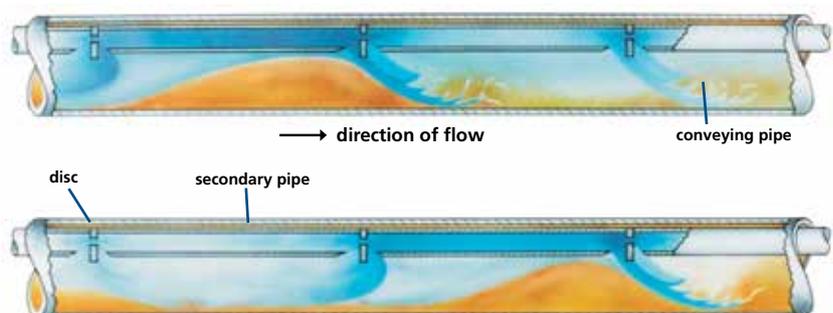
The advantages of this pipe which characterise the Dense Phase Turbuflow System are illustrated in the diagram.



TURBUFLOW® transport system with single pressure vessel



Multi-TURBUFLOW transport system (MTTS)



Principle of the extremely slow transport in a TURBUFLOW® pipe

### Benefit from the advantages of using TURBUFLOW

- Slow and therefore low-wear material movement
- No blockages; restarting possible when pipe is full
- Low maintenance combined with operational reliability
- Highly efficient conveying
- Low air requirement and therefore smaller compressors and exhaust air filters
- Low energy requirement
- Self-regulating; no additional valves along the conveying pipe
- The use of TURBUFLOW gives you
  - low maintenance costs
  - low energy costs
  - low operating costs

### MÖLLER® Silo technology

We design and equip the necessary silos for every type of application, whether as a loading, storage, long term storage, or homogenisation silo, or other type. We have implemented pneumatic ash silos with capacities up to 33,000 t, and mechanical silos with capacities up to 80,000 t.

Discharge from the silos, and loading to trucks, rail wagons, or ships takes place seamlessly. With multiple simultaneous loadings, discharge performances from the silos of up to 1,000 t/h are possible, e.g. discharges to ships of up to 600 t/h and more have already been achieved.



Silo discharges



Fly ash storage



Loading systems



Fly ash silo with loading systems

### MÖLLER discharge systems

We are experienced in design and supply the necessary discharge systems, e.g. for limestone powder used in flue-gas desulphurisation plants.

### Overview of MÖLLER conveying systems

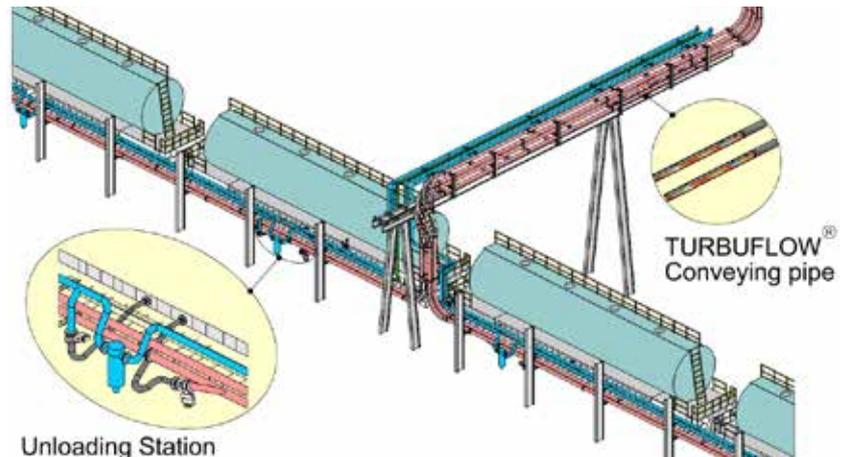
Various conveying systems are available for the many different transport requirements.

Particularly for higher conveying performances or long distances, pressure vessels combined with the patented MÖLLER TURBUFLOW dense phase transport system are the most economical solution.

Another application is the MÖLLER Fluidflow® transport system, which uses permanent fluidisation in the conveying pipe in combination with pressure vessels.

Where space or installation heights are restricted, a solution using Möller pumps may be provided.

For small amounts of conveyed material and short distances, injectors are available. These are often also used for the injection of bulk materials like limestone powder, sand, or fly ash into fluidised bed boilers.



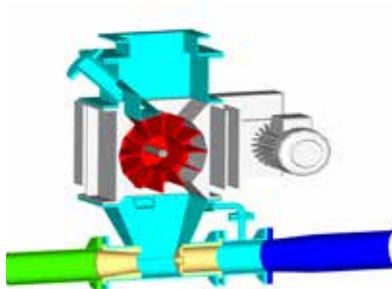
Fully automatic rail wagon discharge using the TURBUFLOW system



Double pressure vessel with pre-hopper



MÖLLER pump



Rotary vane feeder with injector



Single pressure vessel

### Airslides

Airslides represent a transport system which is especially economical in terms of energy. Here, large mass flows can be realized using a small amount of energy. However, to achieve the necessary gradient, a minimum design height is required. High capacities especially necessary for desulphurisation using the recirculation process.

### Dosing systems

From simple rotary flow control valves and rotary vane feeders to weighing vessels, these systems ensure the required mass flow. For example, when introducing lime into a flue gas cleaning.

### MÖLLER components

Our scope of goods and services is completed by a wide range of components which we have been developed by our company for use in bulk handling systems, especially for fine grained and abrasive bulk material.

### Your benefit

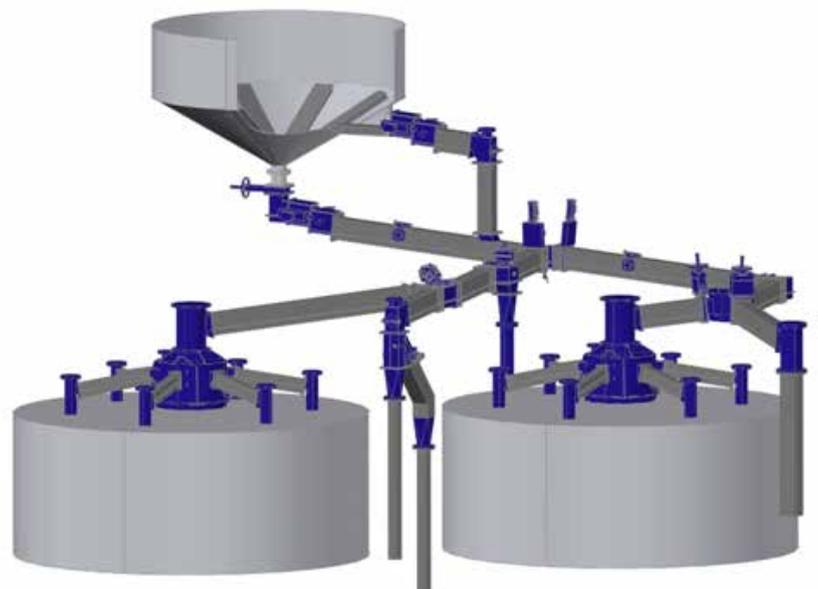
Whether a new construction or a retrofit, with our energy-saving systems we make a small but significant contribution to improving the overall effectiveness of your power station. That protects resources and saves CO<sub>2</sub>.

Our more than 75 years of experience in pneumatic conveying and silo technology guarantee success for you, thanks to reliable and energy-saving systems.

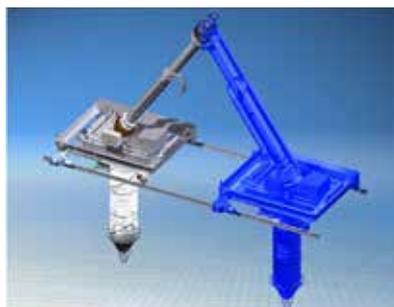
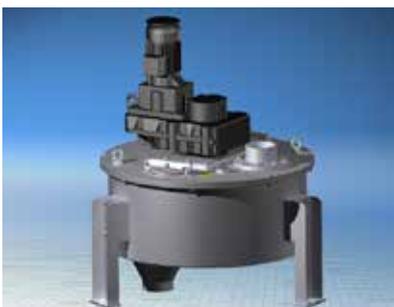
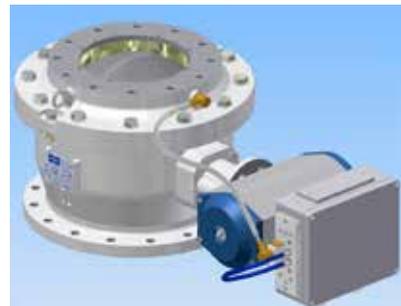
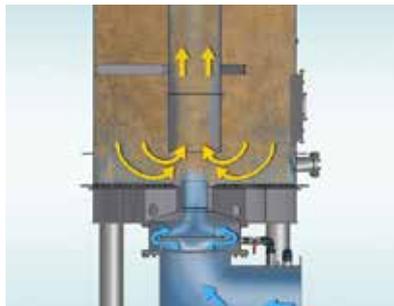
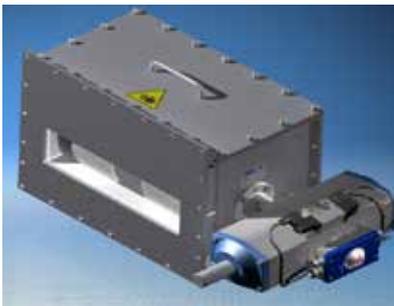
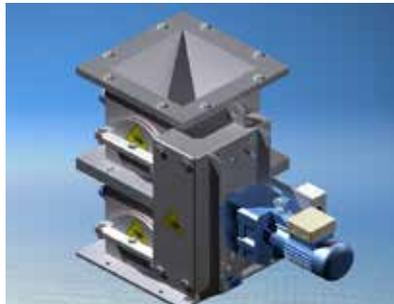
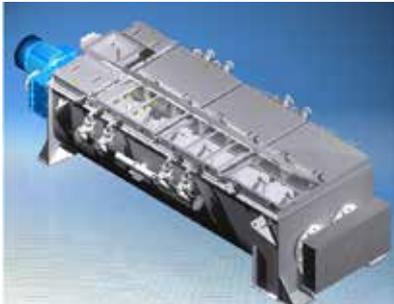
### Excerpt from our reference list

Power Plant	Operator	Country
Neurath	RWE	Germany
Westfalen	RWE	Germany
Eemshaven	RWE	The Netherlands
Datteln	E.ON	Germany
Maasflakte	E.ON	The Netherlands
Boxberg	Vattenfall	Germany
Moorburg	Vattenfall	Germany
Kostolac	EPS	Serbia
Paiton	PT Paiton Energy	Indonesia
Orot Rabin	IEC	Israel
Sostanj	TES	Slovenia
Kozienice	Enea	Poland
Opole	Alstom	Poland

(Date: 2016)



Airslide system



## FLSmidth Hamburg GmbH

Haderslebener Strasse 7  
25421 Pinneberg  
Germany  
Tel.: +49 4101 788-0  
Fax: +49 4101 788-140  
[hamburg@flsmidth.com](mailto:hamburg@flsmidth.com)