We know how to work with Alumina and Aluminium.
About

Since its founding in 1906, Claudius Peters has become one of the world’s most respected engineering houses and an innovative world leader. Its German engineering excellence continues to set benchmarks for the design, manufacture and commissioning of materials handling and processing systems for the gypsum, cement, coal, alumina, steel and other bulk-handling industries.

From conception and installation through to commissioning and after-sales support, Claudius Peters provides world-class service to the world’s biggest bulk materials producers.

The Claudius Peters Group GmbH is headquartered in Buxtehude near Hamburg, Germany, with regional offices in the Americas, Asia and Europe.
Technikum

The Claudius Peters Technical Center is a state-of-the-art facility, offering clients the facility to laboratory test any bulk solid conveying system.

In the Technikum, conveying procedures can be tested for any load, gas velocity, conveying pressure and conveying distance.

Each material is measured for deaeration time, density, humidity and wall friction angle, with data documented in a test report supported by EDP and used to ensure optimal plant design.

State-of-the-art technology to meet any conveying and handling requirement

Specific Technologies include:

- Storage Solutions
  - Anti-Segregation System
  - Homogenizing
- Pot Feeding Solutions
  - Aerated Distribution System
  - Additive Handling
- Petcoke Grinding
  - Claudius Peters EM Mill
- Conveying and Handling Solutions
  - Airlift
  - Pressure Vessel
  - Loading and Unloading
  - FLUIDCON conveying
High-efficiency, low-maintenance pneumatic conveying systems designed to meet any plant requirement.

Materials handling: a clean process
Claudius Peters designs and builds, low-maintenance, environment-friendly systems for any vertical or horizontal transport requirement, from in-plant systems to ship, wagon and truck loading and unloading, incorporating conveying distances up to 5,000 metres.

Claudius Peters X-Pump
- Space saving design
- Engineered for abrasive materials
- Flexible conveying directions
- ATEX certified

Pressure Vessel systems
- Customized systems for economic operation
- Large conveying distances up to 5,000m
- Dust free operation
- Low maintenance required

Schematic of transport cycle.

Cross section of X-Pump. For 3D animation go to www.claudiuspeters.com
The Claudius Peters FLUIDCON system’s unique aeroslide transportation principle delivers pneumatic conveying with considerably lower energy requirements.

FLUIDCON’s dense phase system with increased bulk material load can be used to convey any fine bulk solid that can be fluidized with low air velocities, expanding homogeneously during the process. With appropriate pipe routing, it can also substantially reduce power consumption.

About FLUIDCON
FLUIDCON is a revolutionary, low-energy pneumatic conveyor pipe technology for low, cost gentle materials handling.

FLUIDCON uses the aeroslide principle to completely or partially fluidize material over the horizontal length of a conveyor pipe. Bulk solids are turned into a fluid state with minimal internal friction, creating optimal conveying conditions which enable the conveyance of materials using minimal differential pressure, through uphill inclines of up to 30 degrees.

Advantages of FLUIDCON
- Gentle materials handling. This is due to very low attrition from low conveying velocities, starting at approximately 2-3m/s and ending at approximately 5-10m/s.
- Reduced operating costs, with substantially less energy consumption compared to conventional pneumatic conveying
- High availability. The system is easily started or restarted, even when solids remain in the conveying line
- Alternative feed systems. With reduction in conveying pressure, Claudius Peters X-pumps can be installed instead of conventional pressure vessels, ensuring savings in height and capital costs
Minimizing segregation of material is one of the biggest challenges for the alumina industry. The Claudius Peters Anti-Segregation System ensures a constant mix of coarse and fines, during filling or discharge.

The best mix
Claudius Peters produces a complete range of storage solutions for different industries, from small pre hoppers to large capacity silos.

For the alumina industry, careful attention must be paid to minimizing segregation of the material. This can be done during silo filling, or by homogenizing the material at discharge. Claudius Peters provides solutions for either approach.

Anti Segregation System
For alumina, constant grain size distribution is absolutely crucial. Segregation of the alumina into fine and coarse particles must be avoided at all costs. The Claudius Peters Anti-Segregation System is the ideal solution for achieving this.

In this system, patented filling tubes positioned around the silo perimeter eliminate turbulence as they transport the material downward. When the material leaves the filling tube, it is dust-free, with coarse and fine particles remaining mixed.

The Claudius Peters Anti-Segregation System can be included in a new installation or integrated during plant modification.

- Minimized segregation
- Storage capacity up to 100,000t
- Feeding capacity up to 1,500t/h
- Discharge capacity up to 2,400t/h
- Residual discharge >99% possible

Approx 90% of the silo volume is filled via anti-segregation tubes at the silo perimeter. For the remaining 10%, additional, centrally arranged filling devices are used.
For further optimizing of material quality, Claudius Peters expansion chamber technology provides the ideal solution, resulting in homogeneous material with further reduction of segregation.

**Homogenizing with Expansion Chamber Technology**
Claudius Peters expansion chamber provides homogenization processes to optimize material quality even further.

The expansion chamber controls aeration and blends of various layers within the chamber. These layers are mixed under the ring channel or under a central cone, where material is relieved from the material load outside the expansion chamber area.

Homogenous material quality and less segregation leads to:
- Reduced anode effects
- Less GHG emission
- Improved gas cleaning efficiency

Funnels in the inner and outer area guarantee optimum mixing effects.

Expansion chamber homogenizing technology for optimized material quality
Efficient, safe, reliable materials transport
Requiring minimal aeration air and providing dust-free operation, the Claudius Peters Aerated Distribution System provides safe and reliable transport of alumina, regardless of material quality.

Operating with inclined aeroslides, the ADS system provides safe and reliable operation, regardless of material quality. Any scalings and foreign materials are screened out at the outset, and operation is controlled through aeration of various sections of the aeroslide system.

From a central silo near the gas treatment center the alumina has to be transported to the different electrolysis cells. This transport must be:

- Safe and Reliable
- With low maintenance
- Cost efficient
- Environmentally friendly and dust free

The Claudius Peters Aerated Distribution System provides safe and reliable distribution of the alumina to the electrolysis cells at minimal energy demand.

Transport from day Silo to potroom.
The control system allows for continuous monitoring throughout its operation. There are no moving parts inside the material flow, the entire system operates dust free and it requires only a minimal amount of deaeration volume.

The ADS system can be used for the transport of alumina and for the transport of Alumina fluoride. Design is completely customizable and is suitable for both greenfield and brownfield installations.

Innovation and know-how to drive efficiency even further

- Closed supply system from Silo to Cell
- Safe and reliable
- Dust free
- For new installations and modifications
- Excellent monitoring of the operation
- Very low amount of aeration air needed
EM Mill

The Claudius Peters EM Mill is the industry’s preferred grinding technology for the production of the petcoke for the anode production.

At the heart of the Claudius Peters grinding system is the EM Mill, which brings the functions of grinding and classifying together into one compact unit.

Material to be ground is fed to the ball ring mill centrally from the top, descending to the rotary grinding yoke. The upper fixed grinding ring, pressed down by the hydraulic system, controls the grinding balls.

The calcined petcoke is crushed between the grinding elements and the grinding rings and then transported out of the grinding tack by centrifugal force. Airflow directed upwards captures the ground petcoke, directing it to the integrated classifier.

Any larger particles inside the classifier are then returned for renewed grinding, while other particles leave the mill with the transport gas. The use of a dynamic classifier makes it possible to produce optimum fineness with steepest particle size and distribution lines.
Multiple benefits of EM Mill vertical spindle technology

The introduction of the vertical spindle EM Mill has resulted in dramatic improvement in the consistency and quality of fines for anodes.

**Improved Fines Grain Size Distribution**
The properties of the fines, characterized by grain size distribution or Blaine Number, can now be maintained with far fewer fluctuations, compared to conventional grinding mills.

**Continuous Operation**
The capacity of the EM Mill can be turned down from 100% to 25%, avoiding frequent stopping of the mill to meet production requirements. This reduces the amount of grinding loss and improves overall efficiency.

**Investment costs**
Due to its compact design and the lower noise level, the size of building required to house the grinding plant is relatively small, and noise protection requirements are also far fewer compared to conventional grinding mills. The required silo capacity for the fines is reduced, which, in turn, leads to a reduction of the segregation in the fines silo and further optimization of the quality of the fines.

**Operating Costs**
Low specific drive capacity of the total plant and low maintenance requirements combine to keep operating costs low. The grinding balls are designed to last the entire service life of the mill, which further minimizes maintenance requirements and drives down operating costs further still.

**Reduction of metallic Impurities**
The use of wear-resistant grinding elements reduces the metallic impurities in the fines and therefore in the final aluminium product itself.

**Reduced dust emissions**
Partial recirculation of the grinding plant’s process gas means that total exhaust gas is just the false air produced by individual apparatuses. This means that dust emission released into the atmosphere is always kept to an absolute minimum.

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*State-of-the-art coke grinding technology – achieving ever-greater levels of reliability and energy efficiency*

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*EM Mill for anode coke grinding.*

*Calcined petcoke grinding plant.*
We know how
claudiuspeters.com

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