

GEHO®

Positive Displacement Slurry Pumps

Excellent
Minerals
Solutions



High Concentration Slurry Disposal Solutions

Helping the power industry operate cleanly and efficiently



The Geho High Concentration Slurry Disposal (HCSD) process

When disposing power plant generated ash on landfill areas, an environmental friendly method available is pumping ash slurries at high solids concentration. A slurry with over 60% solids by weight, with typical medium to high viscosity forms a natural slope on the disposal area without the need for mechanical spreading and with minimal release of water. This technology, also referred to as 'high concentration disposal' or 'dry stacking', generates a stable and 'dry' landfill, ready for phased re-cultivation at any given time.

Weir Minerals Netherlands has promoted the Geho HCSD technology within the alumina processing and power industry, and has contributed actively in the development and realization of the HCSD systems. Geho positive displacement pumps have been used successfully worldwide for many years in this modern and economic disposal and landfill method. Weir Minerals Netherlands offers, in cooperation with local/international engineering companies and contractors, a turnkey solution for realizing HCSD systems to power plants.

The greatest design challenge of HCSD systems, specifically for power plant ash, lies in the required system flexibility and variable load. Both the power plant load and typical rheological ash slurry properties can vary in time, even within one power plant using constant quality coal. If warranted by thorough sample testing and detailed slurry engineering, the slurry preparation plant, pipeline and landfill can be designed to handle various mixtures. These slurries can consist of various ratios of fly ash, bed ash, bottom ash and flue gas desulphurization residue. Weir Minerals Netherlands utilizes a suitably equipped slurry laboratory available for all required sample testing of slurries.

A requirement for each application is to define slurry quality targets and operating boundaries for both pipeline operation as well as landfill optimization.

Budge Budge Power Station, India; a Geho piston diaphragm pump transports 55 m³/h fly ash slurry to the disposal area.



Budge Budge disposal area, India.



Bayswater Power Station; transporting 74% Cw fly ash slurry 11 kilometres to an abandoned open pit coal mine.



Bayswater Power Station, Australia; disposal area.



The Elektrarna Ledvice Power Plant deposits residue from coal combustion and flue gas desulphurisation at a distance of 4700 metres against the slopes of an abandoned open pit.



Patnow Power Plant, Poland; two Geho piston diaphragm pumps transport 125 m³/h of fly and bottom ash/gypsum mixture.

Advantages of the Geho High Concentration Slurry Disposal process

The Geho HCSD process addresses modern environmental requirements for disposing of power plant waste. Important and significant advantages of the HCSD system are:

Ecological

- Water consumption: high concentration ash slurries use up to a factor 12 less water than dilute slurries.
- No or minimal contamination by water leaking to the environment.
- Pipeline transportation is safe, silent and reliable without ash spills.
- No or minimal run-off water and water reclaim system capacity.
- Thickened ash is not subject to run-out.
- Dusting is substantially reduced.
- Slurry hardens out allowing rehabilitation.

Operational

- Slurry spreads over area due to gravitation. No mechanical spreading nor operator intervention required.
- High availability, low parts usage, low maintenance.
- No return water system.
- Pipeline scaling eliminated.

Economical

- Substantial energy savings to run system.
- The volumes transported are smaller and pipeline sizes can be reduced by more than 50%.
- By discharging from a central ramp or side-hill, it is possible to avoid raising perimeter dams altogether.
- The self-draining, sloping (2-6%) deposit offers long-term stability and can be reclaimed progressively at minimum cost.
- Significant cost savings in disposal area and dyke construction of up to 60%.
- Method allows for the creation of small 'hills' by stacking the disposed ash.
- Extending life time of existing landfill area under restricted slurry conditions.

Weir Minerals Netherlands has developed a HCSD process which is in service at several power plants now for years. The process requires accurate dry ash dosing, thorough one step mixing and homogenizing in a special design tank. On-line slurry quality monitoring is provided. Geho piston diaphragm pumps are used for economic one stage transport of the ash slurry to the storage facility.

Control and operating philosophy: basis for design of control systems and development of operating manuals.

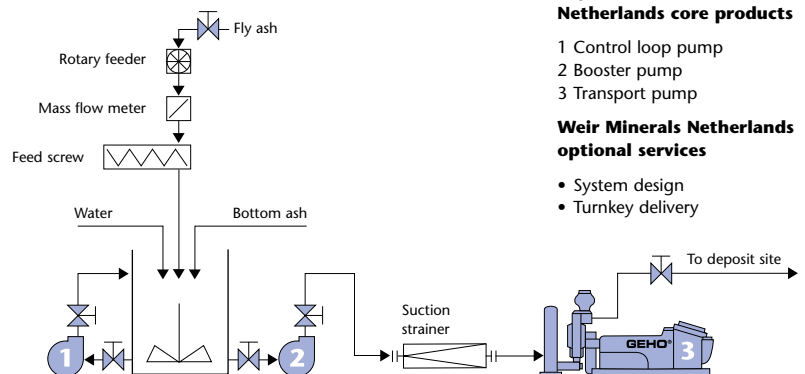


Pumping dense coal combustion residue and sloped disposal reduce cost, preserve flora, fauna and water quality and meet regulations.

Geho duplex piston diaphragm pump at the Timisoara Power Station, Romania, handling fly ash and slag slurry.



Process flow chart - High Concentration Slurry Disposal process



Geho positive displacement pump applications in the power industry

The Geho HCSD system facilitates flexible and compact transportation solutions, for example at the US Jacksonville Power Plant.



Ash handling pumps used at the Khaperkheda Power Plant, India.



Coal combustion

- High-density coal slurry transfer
- Gasifier slurry feed
- PFBC boiler paste feed
- Coal residue high-concentration slurry transportation and disposal

Coal mining

- Long distance coal slurry pipeline transportation
- Mine desludging
- Mine dewatering
- Mine backfilling
- Pond excavation

Principal benefits

- State-of-the-art technology and pumping equipment
- Attractive total cost of ownership
- Long term proven track record
- Flow sheet partnership, laboratory testing and feasibility studies



The hydraulic driven piston pump at Tarong North Power Station in Queensland, Australia, handles 75% Cw fly ash.

WARMAN® Centrifugal Slurry Pumps
GEHO® Positive Displacement Slurry Pumps
CAVEX® Hydrocyclones
ISOGATE® Slurry Valves
VULCO® Wear Resistant Linings

Weir Minerals Netherlands b.v.

PO Box 249, 5900 AE Venlo, the Netherlands
Egtenrayseweg 9, NL-5928 PH Venlo
4495
Registration No.: 12032525

Tel: +31 (0)77 389 52 00
Fax: +31 (0)77 382 48 44
Email: weir@weirminerals.com
www.weirminerals.com

Excellent
Minerals
Solutions

