

Putzmeister Solid Pumps Power Station Applications

Putzmeister



File under: A 1.00, A 4.00, IP 4.05

Co-incineration of sewage sludge in coal-fuelled power stations

Sensible alternatives are being sought to the present method of disposing of mechanically dewatered sewage sludge such as dumping, agricultural use, drying and incineration.

There are a variety of reasons for this:

- When used for agricultural purposes, the heavy metals contained in municipal sewage sludge are an increasing source of problems.
- In the future, it will no longer be permitted to dump sewage sludge in Germany.
- As a rule, the only way to deal with industrial sewage is by dumping or through heat processing.
- The costs of investment and operation for single substance incineration are very high and
- drying sewage sludge is cost-intensive and consumes additional energy.

Furthermore, the municipal authorities are interested in long-term, safe and cost-effective disposal of sewage sludge from their sewage treatment plants.

Basic idea and engineering

The process is installed in conventionally fuelled power stations where mechanically de-watered sewage sludge is incinerated in existing furnaces. In the co-incineration process, the sewage sludge is fed into existing boiler plants together

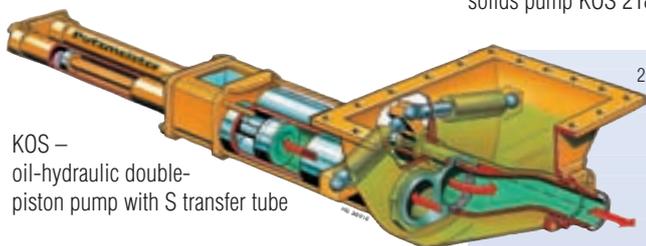
with the primary energy carriers, brown coal or hard coal.

Depending on the boiler capacity and on the type of coal used, approximately 1 % to 5 % of the dry coal flow is added as dried sewage sludge.

For this purpose, both coal and the metered quantity of sewage sludge are introduced in the coal pulverizing unit, then mixed together and dried.

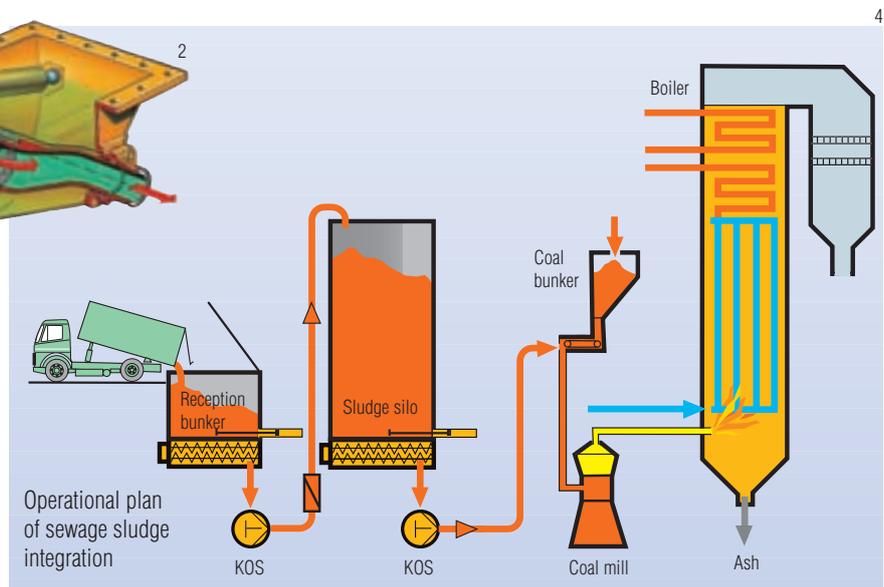


Co-incineration of sewage sludge in the coal-fuelled power station Zolling: solids pump KOS 2180



KOS – oil-hydraulic double-piston pump with S transfer tube

The co-incineration of mechanically dewatered sewage sludge in existing coal-fuelled power stations with highly effective flue gas pollution control is an economic and sensible alternative to the above-mentioned, environmentally harmful disposal methods.



Handling of fuel coal paste and waste coal sludges

Pressurized fluidized-bed incineration – the hallmark of clean coal technology

This technology is distinguished by its low environmental impact and a higher degree of efficiency than conventional coal-burning processes.

Putzmeister is making a major contribution towards clean power stations. PM solids pumps from the KOS series without valves feed fuel into the fluidized bed in the form of a coal-limestone-water mixture.

Solids contents of over 85 % are pumpable, depending on the granular structure of the material. The pumps offer reliable continuous operation, give no trouble and require no maintenance.

Co-incineration of waste coal in coal-fuelled power stations

During the coal preparation process while washing the black coal a lot of valuable fine coal particles are washed away. Instead of depositing them in lagoons this enriched coal wash slurry

can be dewatered and used as a waste coal sludge to be co-incinerated in coal-fuelled power stations.

Putzmeister silo- and pumping technology enables power stations by implementing such a system to increase the profitability of the power plant by simultaneously reducing vast amounts of waste coal reservoirs which are not environmental friendly.

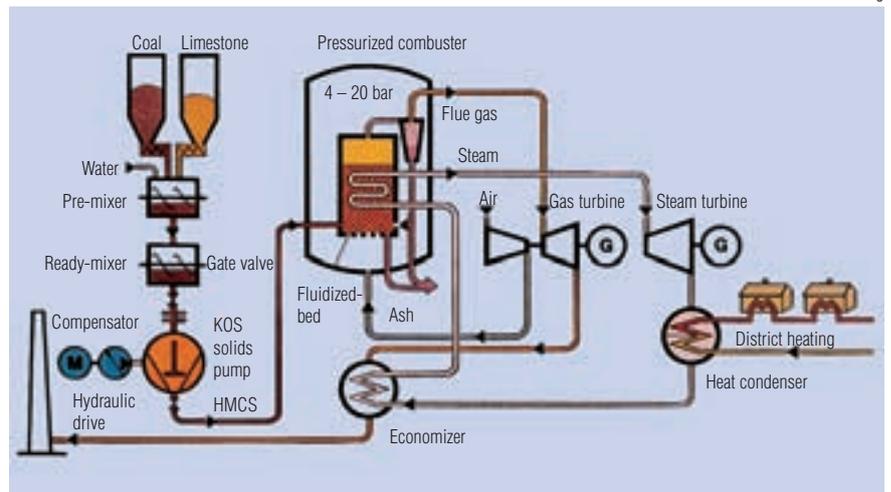
Putzmeister Solid Pumps GmbH provides total systems from the reception

bunker to the injection lances into the boiler.

Example:

Putzmeister installed three systems for co-incineration of waste coal in Poland. The power stations in Jaworznow (PL) and Katowice (PL) installed such a system in 1999. In 2002 a system was installed in the power station in Sierza (PL).

In Huaibei (CN) in 2009 the latest waste coal system of Putzmeister started up.



Coal injection with pressurized fluidized-bed combustor. The flow chart shows a combined gas and steam turbine process with pressurized fluidized-bed combustion (ABB Carbon)



Coal sludge receiving area in power station



KOS 2180 coal transportation pump for long-distance coal delivery



KOS 1070 coal sludge injection pump

Handling of fly- and bottom-ash with Putzmeister piston pumps

Economical fly- and bottom-ash transport as high density slurries

After the incineration of coal in coal fuelled power stations the resulting waste ash such as fly-ash from the electrofilters or the bottom-ashes from the boiler have to be disposed.

The most economic way of disposing different kind of ashes is using a hydraulic transport system like Putzmeister piston pumps. By using the Putzmeister KOS type piston pumps a mixture of both fly- and bottom-ashes can be transported successfully without operational disturbances. Due to the fact that the Putzmeister KOS piston pump has no valve between the inlet and outlet of the pump even coarse particle can pass the pump without stopping the process.

Another important aspect for using Putzmeister piston pumps is the fact that high dry solid contents can be handled and water content can be reduced to a minimum.

Due to the low water content the lifetime of the disposing area can be extended or a smaller disposing area can be designed. Also the environmental fact of large amount of contaminated water can be reduced to a minimum.

Putzmeister solids pumps meet the critical requirements of power station designers and operators

- constant availability
- long service life
- low maintenance and operating costs
- easy to service

In order to ensure that its systems can be fully integrated into power stations Putzmeister works closely with the leading suppliers of power station equipment worldwide.

Further important areas of application for PM solids pumps in power stations are the pumping of fly ash, bed ash and sulphurization gypsum.

As a way of increasing the economic efficiency of the power station Putzmeister can supply entire systems for the parallel incineration of sewage sludge and waste coal in the coal-fired power station. This turnkey solution consists of silos, solids pumps, pipework and includes all necessary accessories and services.



Fly and ground ash in KOS 25100 pump installation (Kogan Creek, Australia)



Fly ash disposal site

Member of the Putzmeister Group
www.putzmeister.com

Right to make technical amendments reserved
© by Putzmeister Solid Pumps GmbH 2010
All rights reserved
Printed in Germany
(11008)

Putzmeister Solid Pumps GmbH
Max-Eyth-Straße 10 · 72631 Aichtal/Germany
P.O.Box 2152 · 72629 Aichtal/Germany
Tel. +49 (7127) 599-0 · Fax +49 (7127) 599-988
psp@pmw.de · www.putzmeister-solid-pumps.com

Putzmeister