

Primary energies such as coal and natural gas are currently so expensive that energy intensive industries are being forced to look into alternative fuels. Putzmeister Solid Pumps is supporting the cement industry, by providing silos and pumps to receive and supply alternative fuels, to produce reasonably priced cement for all kind of construction works.

Transporting the materials

Alternative fuels must have a proven high calorific value to make a worthy replacement for primary energies.

Fuels suited for this purpose are:

- mechanically dewatered sewage sludge
- oil sludges
- paint sludges
- and other similar materials

These fuels are placed in silos, either individually or mixed together. The Putzmeister high density solids pump supplies these secondary fuels, either on the cold side of the rotary kiln as additives and energy suppliers, or on the hot side as fuels.

Materials

As has been mentioned, a variety of different materials can be used. This is not at all affected by whether there are foreign bodies in the material, since the Putzmeister S-tube technology is able to convey these foreign bodies even if they occupy up to 2/3 of the pipeline diameter. The secondary fuels being fed to the Putzmeister high density solids pump should be supplied in a processed form (they must be suitable for pumping).

Co-incineration of alternative fuels at cement plants



Le Teil Lafarge, France



Sludge from coolant preparation



Sewage sludge



Lime stone sludge



Paint sludge

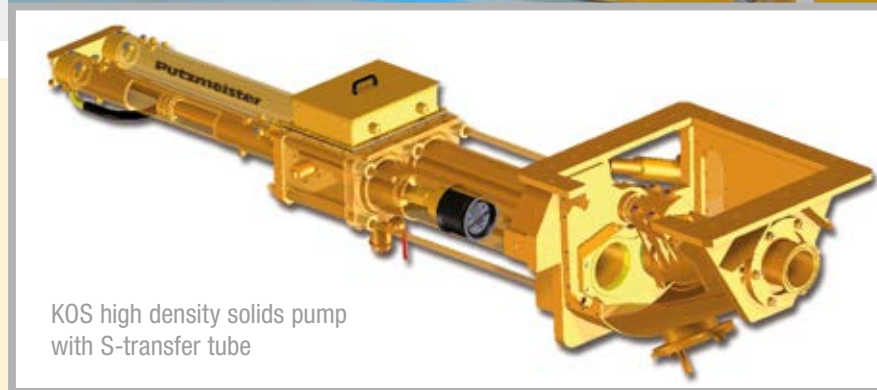


Hazardous waste

Machine equipment

The volume of material to be fed into the cement kiln is approx. 2 – 10 m³/h. Thus Putzmeister high density solids pumps in the KOS 1040 to KOS 1050 range are used.

Heidelberg Cement Guangzhou, China



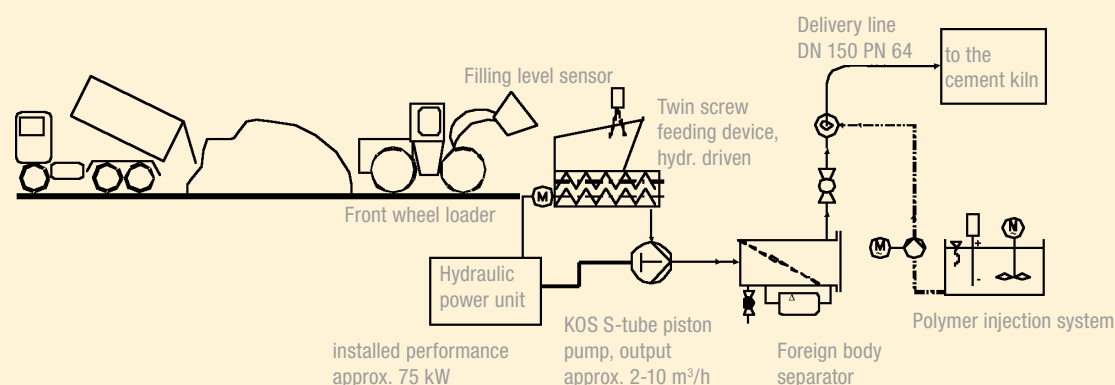
There are three types of sludge handling stations:

Station type 1

The receiving station consists of a high density solids pump with a precompression screw conveyor and a built-in attachable hopper with a volume between 6 and 10 m³. The pump unit is charged with a front wheel loader.

- The pump unit is mobile, which means it can be used on more than one cement plant.

- This compact unit can supply alternative fuels economically to the cement kiln.
- A wide range of different sludges can be mixed on the spot and fed to the pump unit.

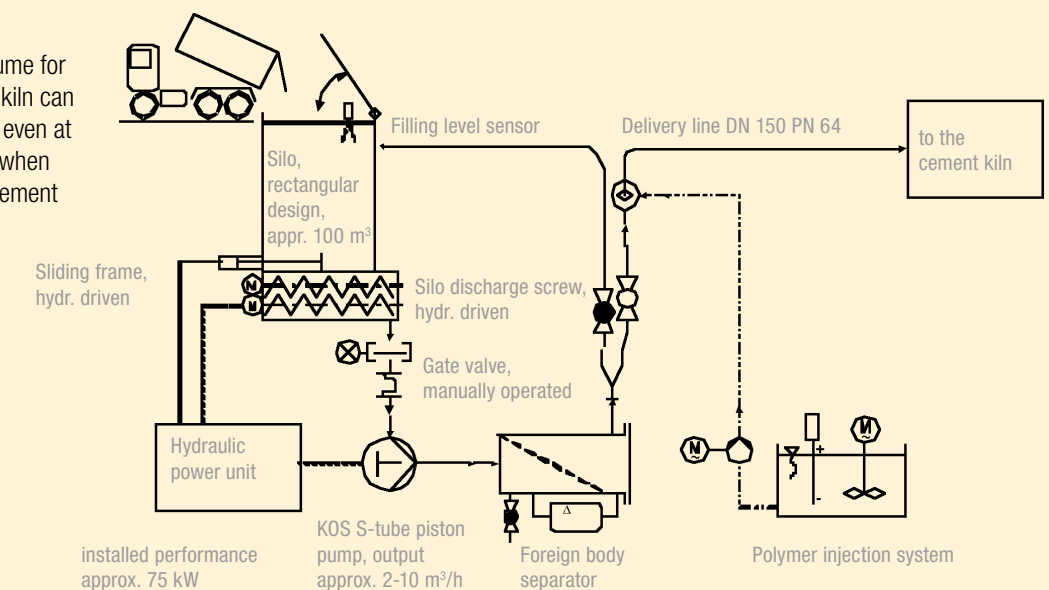


Station type 2

The pump unit used for station type 2 is identical to that employed with station type 1. The only difference is that the attachable hopper is replaced by a receiving silo with a volume of approx. 100 m³.

- Thanks to the large storage volume for the alternative fuel, the cement kiln can now be continuously charged – even at weekends and during holidays, when there are no deliveries of replacement fuel.

- Different sludges can be fed into the high density solids pump and mixed together by the pump's rotate function.

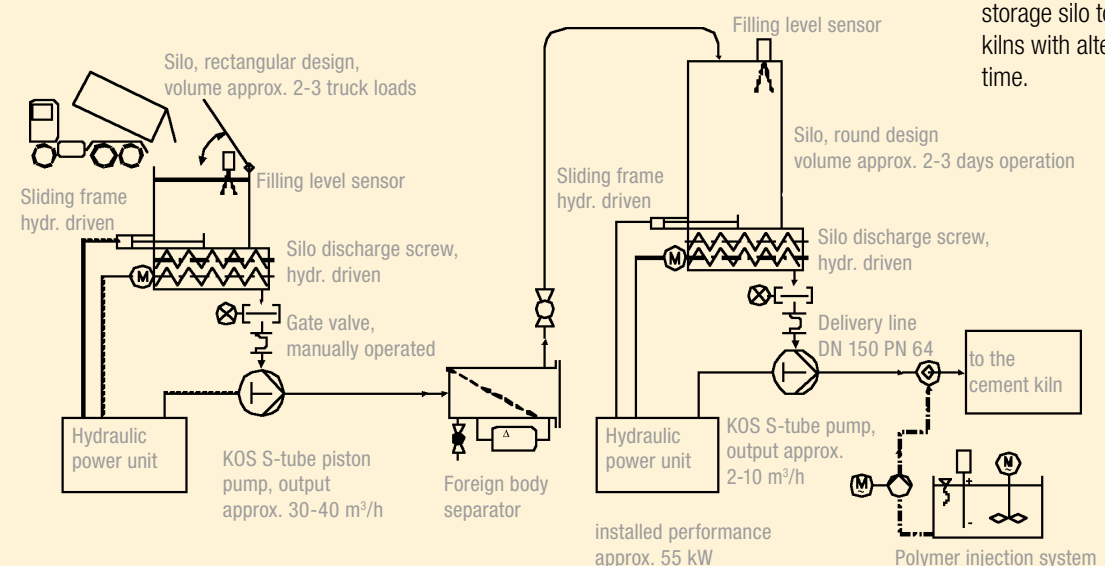


Station type 3

- Different alternative fuels can be delivered in one or more receiving bunkers.

- High-volume high density solids pumps convey the fuel into a storage silo of approx. 250 m³ in volume. The receiving bunker is thus available for new deliveries of fuel.

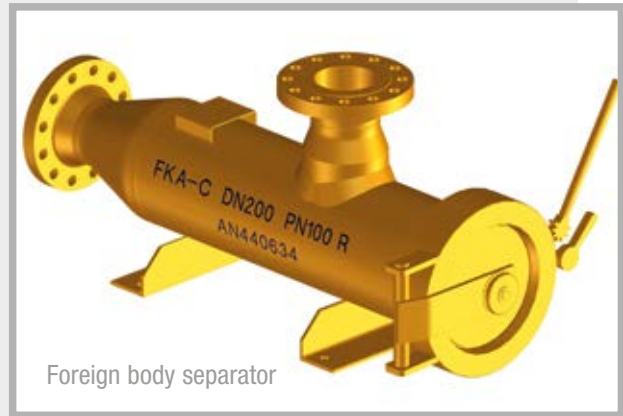
- The alternative fuels mix together well in the high volume storage silo, thus guaranteeing a constant calorific value.
- One or more Putzmeister high density solids pumps can be arranged under the storage silo to feed one or more cement kilns with alternative fuel at the same time.



Features of Putzmeister machine technology

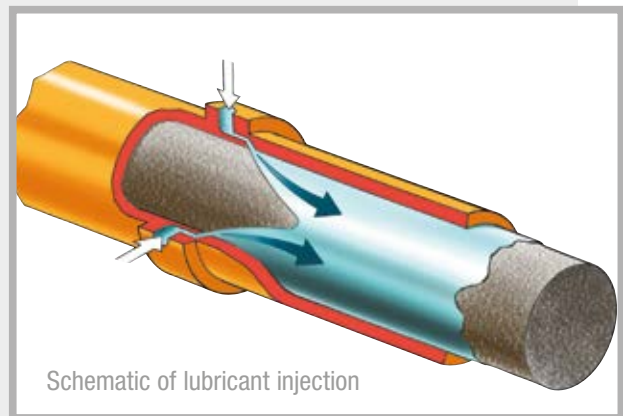
Foreign body separator

Alternative fuels always contain foreign bodies, which are not beneficial to the combustion process in the cement kiln. With the Putzmeister foreign body separator, these foreign bodies no longer cause problems.



Boundary layer lubricant injection station

If the receiving and storage stations are further than 70 m from the cement kiln, a boundary layer lubricant injection station can inject water or used oil to reduce pressure loss and increase transportation length.



Delivery line

Due to the fact that the delivery output is in the range of 2 – 10 m³/h, a pipeline diameter of DN 125 to DN 150 is used.

Ex-protection

Since alternative fuels are flammable, the pump system often has to be equipped regarding to ATEX or an equivalent ex-protection regulation. Putzmeister machine technology meets the necessary requirements, and thus can contribute to converting waste material into a valuable fuel.



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