

Electro-osmosis enhances the effects of conventional filter press dehydrators, according to Japanese engineers S Kondoh and M Hiraoka

Electrodes give dewatering a boost

Japanese trials on a new sludge dewatering technique involving electro-osmosis applied to conventional filter press dehydrators have resulted in water content reduction down to 50%-60%.

The "pressurised electro-osmotic dehydrator" (PED) is said to be faster and more effective than conventional techniques using pressure alone.

When placed in an electric field particles composed of negatively charged bacteria move to the anode and are repelled from the cathode. Only a few viscous particles remain on the negatively charged filter surface.

Electro-osmosis takes place in the next stage of the process under the influence of an applied direct current. Liquid in the sludge becomes

positively charged and is attracted to the cathode. Water moves smoothly through the filter cloth on the cathode since few particles become deposited there causing clogging.

When electrolyte is added to the PED process, dewatering speed is accelerated and the final water content is much lower than in the cake without electrolyte.

The most important factor in the commercial development of the system has been the durability of electrodes used. Researchers looked into the relatively insoluble materials, such as platinum and lead dioxide, but found these to be too expensive. Since stainless steel and lead were not sufficiently durable, the researchers turned to an inexpensive special carbon electrode.

Various steps (LEFT) take place inside the PED unit (BELOW).

