FEATURES OF LIME SLUDGE DEWATERING AT WATER TREATMENT FACILITIES USING A JD-TYPE ROLLER PRESS

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Lime sludge, formed as a by-product of water softening processes, presents a significant challenge for dewatering due to its high moisture content, fine particle size, and adhesive properties. This type of sludge typically consists of calcium carbonate ($CaCO_3$), which tends to clog dewatering equipment and causes rapid wear of its components.

Traditional dewatering technologies such as centrifuges and chamber filter presses are often ineffective for lime sludge, as they either require high energy input or exhibit frequent clogging and maintenance issues. In contrast, roller presses offer a promising alternative due to their ability to handle abrasive and fine-grained materials with minimal energy consumption and mechanical wear.

This study presents an evaluation of lime sludge dewatering using a JD-type roller press. To ensure optimal performance, a two-stage chemical conditioning process was applied: a coagulant was dosed into a static mixer, followed by flocculant injection into a flocculation tank. The initial sludge solids content ranged from 4–6%, and the resulting dewatered cake had a solids content of 32–45%. The solids capture rate exceeded 95%.

The JD roller press demonstrated continuous and stable operation, thanks to its low-speed rotation, self-cleaning mechanism, and open design. These features prevented clogging and significantly reduced maintenance frequency. The substantial reduction in sludge volume allowed for decreased transportation and disposal costs, while also reducing the need for lagoon storage. Compared to centrifuges, the JD roller press consumed significantly less energy and required simpler maintenance.

Thus, the JD-type roller press represents an efficient and cost-effective solution for lime sludge dewatering at water treatment plants. Its implementation improves the overall energy efficiency, operational reliability, and environmental sustainability of sludge management processes.

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