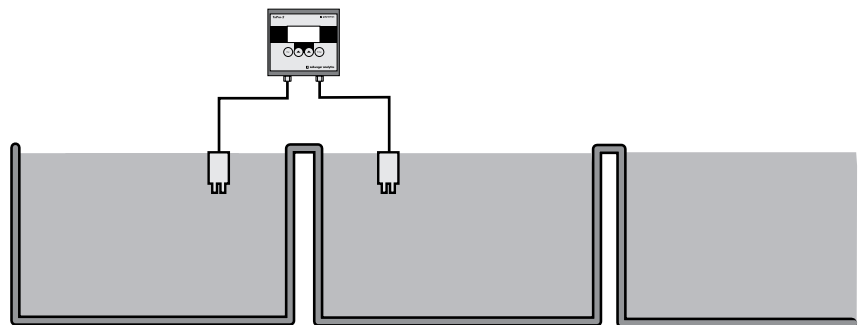


Mixed liquor suspended solids in wastewater

application note



An RD-240 sensor and a TxPro™-2 transmitter monitor the concentration of MLSS in an aeration basin.

Description

Mixed liquor is a mixture of raw or settled wastewater and activated sludge contained in an aeration basin in the activated sludge process. Mixed liquor suspended solids (MLSS) is the concentration of suspended solids in mixed liquor, usually expressed in milligrams per liter (mg/l).

Critical factors

Within the aeration basin, dissolved oxygen (DO), pH, active biological mass, mixing, rate of oxygen utilization, temperature, MLSS concentration and retention time are critical factors that must be closely monitored.

Influent

Effluent from a primary clarifier and return activated sludge from a secondary clarifier are mixed together and pumped to an aeration basin.

In the basin, aerobic microbes decompose organic matter in the mixed liquor. The MLSS concentration is typically 2500 mg/l with a calibrated range of 0–5000 mg/l.

Retention time

Depending on the temperature, type of sludge, size of tank and other variables, the retention time of mixed liquor in an aeration tank ranges from 10 to 20 days. The process operates on either a batch or a continuous basis. In some operations the aeration system is shut down for one to two hours to allow the sludge to settle and a clear supernatant (surface water) to form. The supernatant is then drawn off to allow the addition of more sludge.

Effluent

Due to settling and supernatant pump-out, MLSS concentration in the effluent (activated sludge) is typically double that of the influent MLSS concentration. Part of the mixed liquor is returned to the secondary clarifier. The rest is "wasted"; that is, diverted from the return loop and pumped to the thickening/digesting stage for further processing. Removing the waste activated sludge maintains the MLSS loading level in the aeration basin.

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Monitoring the MLSS concentration is an effective means of controlling the microbial activity in an aeration basin because of the direct correlation between the suspended solids concentration and the size of the microbe population. The longer the process has been in the tank, the greater the microbe population.

For this application, use an RD-240 sensor with a TxPro-2 transmitter. Since the transmitter is dual-channel, you can use two RD-240 sensors with one TxPro-2 transmitter to obtain measurement in two aeration basins. The sensor should be suspended in the media at the end of a PVC pipe that is fastened to the basin railing. The TxPro-2 transmits a 0/4-20 mA signal, proportional to the solids concentration, to remote control equipment. The controller uses this data to maintain the MLSS level.

This publication is not intended to form the basis of a contract. The company reserves the right to change design and specification of its products without notice.

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