

OTHER REQUIREMENTS

Sludge discharge: It is necessary to keep provision for removal of excess sludge from the reactor to minimize washout of the sludge through effluent. Although, the excess sludge is wasted from about middle height of the reactor, it is also necessary to make arrangement at bottom of the reactor. Also, 5 to 6 numbers of valves should be provided over reactor height to facilitate sampling of the sludge. The discharge of excess (flocculent) sludge should be done from the upper part of the sludge bed.

Effluent recycle: For treating high strength wastewater it is recommended to apply effluent recycle, in order to dilute COD concentration and to improve contact between sludge and wastewater. For treating wastewater with COD concentration greater than 4 - 5 g/L, it is recommended to apply dilution during start-up, for proper granulation of sludge inside UASB reactor [Ghangrekar et al., 1996a, Lettinga and Hulshoff, 1991]. Hence necessary arrangement for effluent recycle should be made while designing the inlet and outlet pipe system.

Auxiliary equipment: A satisfactory operation of an anaerobic treatment system requires proper control, as far as possible, for maintaining optimal environmental conditions. To facilitate monitoring of environmental conditions in the reactor certain measurement and control equipment are required to be installed. Depending on the type of the wastewater to be treated, the equipment has to be installed for addition of essential nutrients (like ammonia, phosphate, sulphate), and alkalinity addition for control of pH of the influent. The other equipments to be provided are for measurement and recording of pH, temperature, influent flow rate, and gas production rate.

Corrosion Control: The problem of corrosion occurs in upper part of the reactor where H_2S is oxidized to sulphate by air (oxygen). This can lead to very low local pH conditions. Both concrete and steel will be affected due to low pH. Corrosion by dissolved CO_2 will occur under the water level and CaO from concrete will dissolve as a result of the presence of carbonic acid. Depending on the construction materials used, corrosion of the settler plates may occur as a result of the presence of CO_2 . In order to prevent these problems either corrosion resistant construction materials (stainless steel or plastics) or proper coatings have to be applied. Polypropylene coated concrete can be used for reactor body and a material consisting of plastic covered with impregnated hard wood can be used for settler. Also, ferrocement might be an attractive construction material.