

WWTP Polymers

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OTHERS :

Deposit control

Biocide

Deinking
Chemical

Defoamer

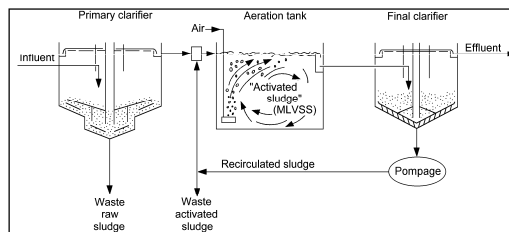
Formation Aids

Felt & Wire
Conditioning

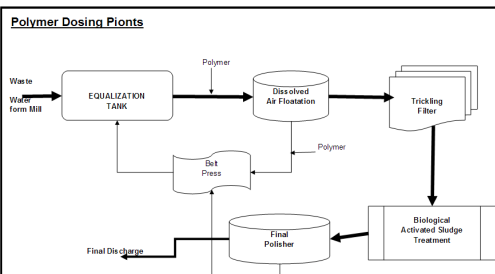
With the exception of a handful of Zero discharge brown paper mills, almost all Pulp and Paper mills worldwide have to solve the hassle of Waste Water Discharge. Paper mills consume huge quantity of water and chemical, thus their effluents will have high temperature, total suspended solid (TSS), Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) which needed treatment.

High temperature effluent problem in Paper Mills can be solved by physical means of cooling and dilutions. To tackle TSS problem, one has to use both Physical and Chemical method. High density contaminants of TSS is separated by gravity in the equalization tank. To separate fibre from liquid effluent, a process called Dissolved Air Floatation is deployed. In this location, coagulant and flocculent are added before the fine and wasteful fibre are skimmed off from the surface of this cell. The skimmed sludge is de-watered in a Belt Press with the help of another dewatering polymer. The roles of WWTP polymer are flocculation and dewatering.

With reduced TSS, the effluent is pumped to a Trickling Filter which acts as a Cooling and Aerating tools for aerobic bacteria to thrive. Both BOD and COD can be lowered by 50% in this zone. However for more stringent environmental control standard, this 100 ppm BOD/COD reduction will not meet the required standard. Further biological treating is necessitated. Sequential Batch Reactor SBR, Biofiltrations and acti-



ated sludge treatments are various examples of Biological treatment. The most advanced biological treatment with a combination of 2-stage Anaerobic and Activated sludge is capable of lowering BOD by 1,200-1,500 ppm. All biological treatment program requires bio-nutrient additions to function well. Nitrogen and Phosphorus are essential elements for growth. It is always advisable to maintain min. quantity of these 2 elements in the system. The other aspect of monitoring in this area is Dissolved Oxygen as all aerobic bacteria needs oxygen to grow and multiply. It is also a good practice to record Dissolved Oxygen at various depth of the Biological treatment pond; with poor turbulence, some areas of the reactor



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pond may have lower DO, and that becomes conducive for anaerobe to multiply. Retention time is critical for the functionality of biological WWTP and this has always been the stapling block for paper mills to invest. A 7-Day Anaerobic Activated sludge treatment can discourage a profitable large integrated mill to put in their money, smaller mills would divest their investment to improve productivity.

Biological WWTP's do face frequent problem of Bulking. This is when the activated sludge is experiencing variations in pollution load, DO slips, shortage of N and P, change in pH and temperature. The problem can be overcome first by examining the sludge under microscope. The presence of filamentous bacteria can indicate an anaerobic environment. High acetic acids ambient would confirm this up-set.. The solution to it is to lower the pollution load, increase DO and other bio-nutrient until the system is normalized.

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