AquaSust

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Sewage Treatment Air Flow Calculation

Blue block is the design datameter : be filled in

Brown: calculate process data

Red : last result for your process

1.Sewage Treatment--Parameter

Water volume m3/h	COD（mg/l）	BOD	
46	1200	No data：BOD=0.5×COD=600mg/L	600

2. Calculation by Gas-Water Ratio

Contact oxidation tank	15:01	15×46=690m3/h	690	
Activated sludge tank	10:01	10×46=460m3/h	460	
Conditioning tank	5:01	5×46=230m3/h	230	
Total air volume	690+460+230=1380m3/h=23m3/min		1380	

3.According to Remove 1kgBOD Need 1.5 Oxygen

The amount of BOD removed per hour is:	600mg/L×46m3/h=27.6kg		27.6	
Oxygen demand	27.6×1.5=41.4kg/h		41.4	
Weight of oxygen in air	0.233kgO2/kgAir			
Density of air:	1.293kg/m3			
Then the amount of air required:	41.25÷0.233=177.7kg/h		177.6824034	
Then the volume of air	177.04÷1.293=137.4m3/h		137.4187188	
Set the microporous aeration head oxygen utilization rate of 20%				
Then the actual amount of air required	137.4÷0.2=687m3/h=11.45m3/min		11.4515599	

4.According to The Unit Pool Area Aeration Intensity Calculation

Aeration intensity generally 10-20m3/m2.h				
Aerobic pool to take the middle value of 15m3/m2.h		15	125	
Adjustment pool take 5m3/m2.h		3	120	
Contact oxidation and activated sludge tank area			0.25	
Then the aerobic tank requires air volume	125×15=1875m3/h=31.25m3/min			
Then the air volume required for regulating tank				