

Aeration sedimentation tank Calculator

Blue block is the design datameter : be filled in

Green: calculate process data

Red : last result for your process

1.Advection sedimentation tank calculation

1. Design inlet water quality parameters

Design flow (Q)	5000	m ³ /d	Design water	25	°C			
COD (Co)	500	mg/L	SS (So)	400	mg/L	BOD (Bo)	300	mg/L
NH3-N (No)	25	mg/L	TN (TNo)	40	mg/L	TP (TPo)	15	mg/L

2. Design removal rate%

COD:	20	%	SS (So) :	40	%	BOD (Bo) :	15	%
NH3-N:	0	%	TN (TNo) :	5	%	TP (TPo) :	7.5	%

3. Design effluent water quality parameters

COD (Ce)	400	mg/L	SS (Se)	240	mg/L	BOD (Be)	255	mg/L
NH3-N (Ne)	25	mg/L	TN (TNe)	38	mg/L	TP (TPe)	13.875	mg/L

4. Sedimentation tank parameters and some basic requirements

Surface load (q)	1.2	m ³ / (m ² .h)	For urban sewage, the surface load of the initial sedimentation tank is generally between 1.2-2.0, and the weir load is less than 2.91/ (s.m).					
Precipitation time (t)	1.5	h	Secondary sedimentation tank, after activated sludge method, the surface load is generally between 0.6-1.0, weir load ≤1.71/ (s.m)					
Horizontal Flow rate (v)	5	mm/s	After biofilm method, surface load is generally between 1.0-1.5, weir load ≤1.71/ (s.m)					

- 4.1, the diameter of the static pressure mud discharge pipe should not be less than 200mm
- 4.2, the static pressure sludge discharge head of the primary sedimentation tank should not be less than 1.5m; The hydrostatic head of the secondary sedimentation tank: the biofilm method should not be less than 1.2m, and the activated sludge method should not be less than 0.9m.
- 4.3. The aspect ratio of advection sedimentation tank is not less than 4, and the general value is 4-5
- 4.4, advection sedimentation tank length depth ratio is not less than 8, the general value of 8-12
- 4.5. Longitudinal slope of the bottom of the pool: When mechanical mud scraping is used, it is not less than 0.005, and the general value is 0.01-0.02
- 4.6, the maximum horizontal flow rate: primary sedimentation tank 7mm/s, secondary sedimentation tank 5mm/s
- 4.7. Baffles should be set at the inlet and outlet, which are 0.1-0.15m higher than the water surface in the pool.

Baffle submerged depth: the inlet should not be less than 0.25m, generally 0.5-1.0m; The exit is generally 0.3-0.4m.

Baffle position: 0.5-1.0m away from water inlet, 0.25-0.5m away from water outlet.

5. Sedimentation tank design calculation

5.1 Surface area of the pool (A)	173.6111111	m ²						
5.2 Effective depth of precipitation (h2)	1.8	m						
5.3 Effective volume of precipitation (V)	312.5	m ³						
5.4, sedimentation tank length (L')	27	m	Calculate weir length L:	19.95530013	20	m		
5.5. Total width of sedimentation tank (B)	6.430041152	m	Check the aspect ratio:	4.5				
Round it up	6	m	Check the length-depth ratio:	15				
5.6. Number of pools (cells) (n)	2	pcs						
The width of each (cell) (b)	3	m						
5.7. Total volume required for sludge (V)								
Time between sludge removal (T)	0.5	d						
Sludge density (γ)	1	t/m ³						
Sludge moisture content (ρ0)	98	%						
V=Q*(S0-Se)*10 ³ *(-6)*100*T/(γ*(100-ρ0)) =	20	m ³						
5.8 Total height of the pool (H)	2.72	m						
Sedimentation tank Height (h1)	0.3	m						
Buffer height (h3)	0.5	m	The value ranges from 0.3 to 0.5					
Sludge area height (h4)	0.12	m						
5.9, sludge bucket volume (V1)								
Sludge tank height (h4')	0.75	m						
	7.875	Round it up	8	m ³				