

**Western Municipal District - Water Reclamation Facility  
Diffused Aeration Systems**

**FINE BUBBLE DIFFUSER SYSTEM  
Airflow Required for Complete Mixing based on Surface Area of Tank**

**Recommended Design Values for Mixing**

Velocity Gradient G (sec-1)	Airflow per Surface Area Ratio cfm per sq.ft. surface area
74	0.140 cfm/sq.ft. for MLSS up to 1000 mg/l
79	0.160 cfm/sq.ft. for MLSS up to 1500 mg/l
83	0.180 cfm/sq.ft. for MLSS up to 2000 mg/l
88	0.200 cfm/sq.ft. for MLSS up to 2500 mg/l
96	0.240 cfm/sq.ft. for MLSS up to 3500 mg/l
104	0.280 cfm/sq.ft. for MLSS up to 4500 mg/l

Specific Weight = 62.4 lb/ft<sup>3</sup>  
Dynamic Viscosity = 2.360E-05 lbf-s/ft<sup>2</sup>

**MIXING DESIGN EVALUATION**

\* Gradient values shown are equivalent to Surface Area Ratio at 10' submergence.

**Diffuser Model  
TFX-40**

Tank	Method 1		Design Unit Air Flowrate		Airflow Rate Required		Air Flowrate per Diffuser		Fine Bubble Diffusers Required
	Surface Area sq.ft.	Surface Area sq. meters	cfm/sqft	m3/hr/sq.m	cfm	m3/hr	cfm	m3/hr	
1	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0
2	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0
3	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0
4	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0
5	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0
6	3,000	279	0.20	3.658	600.00	1019.38	6.12	10.398	98.0

**18,000.00** sq.ft  
**1672.2** sq.m.

**3,600.00** cfm  
**6116.3** m3/hr

**588** units

Tank	Method 2		Depth feet	Depth meters	Equivalent Power		Mean-Squared Velocity Gradient G, sec-1
	Volume cu.ft.	Volume cu.m.			ft-lb/sec	kW	
1	48,000	1,359	16	5	8,184	11.10	85
2	48,000	1,359	16	5	8,184	11.10	85
3	48,000	1,359	16	5	8,184	11.10	85
4	48,000	1,359	16	5	8,184	11.10	85
5	48,000	1,359	16	5	8,184	11.10	85
6	48,000	1,359	16	5	8,184	11.10	85

\*\* Velocity Gradient values will increase as submergence increases greater than 10'