



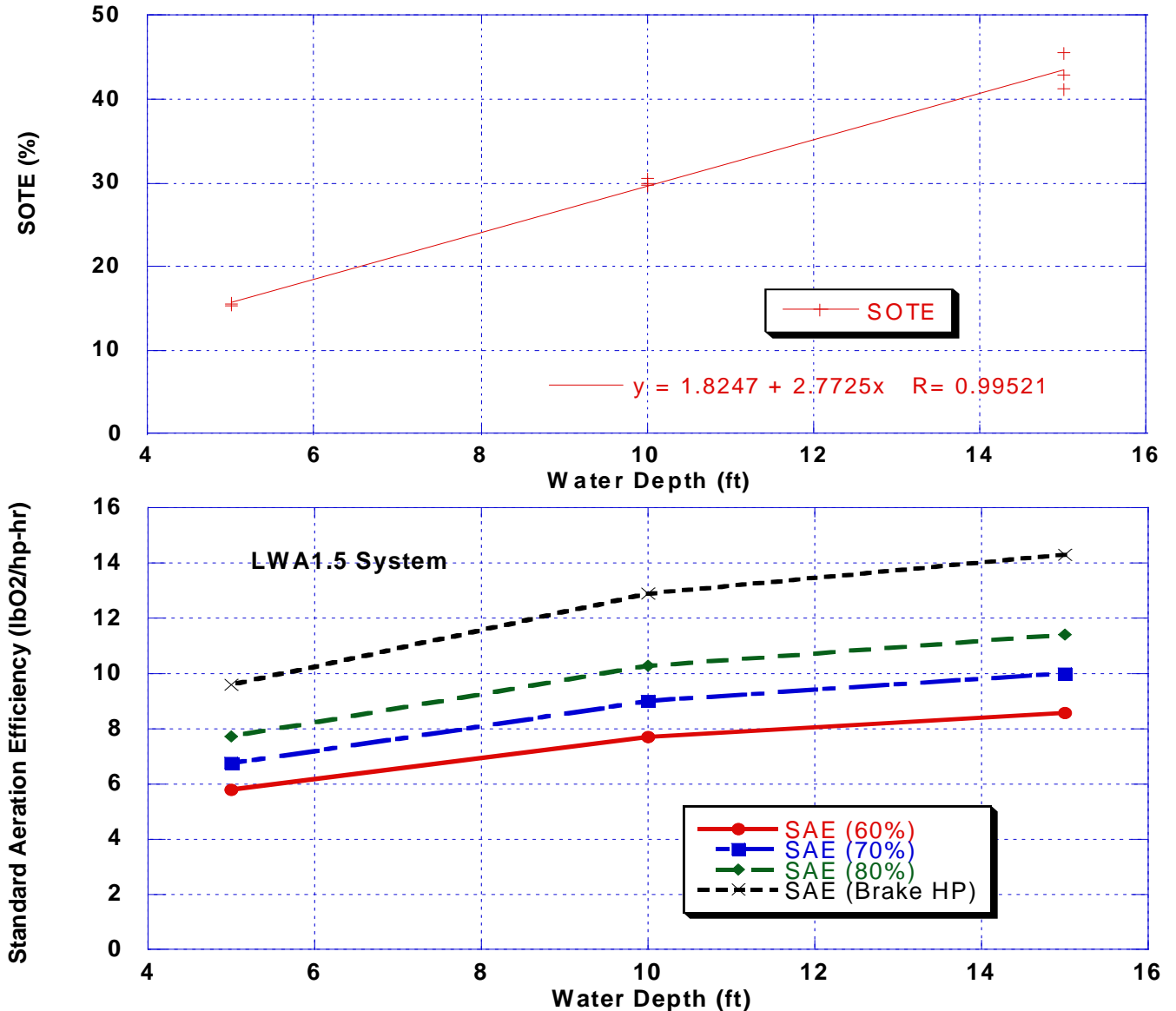
# Air Diffusion Systems

Fine Bubble Aeration For Water & Wastewater Treatment

3964 Grove Avenue, Gurnee, Illinois 60031 USA

Phone: (847) 782-0044 Fax: (847) 782-0055 email : [john@airdiffusion.com](mailto:john@airdiffusion.com)

**Air Diffusion Systems "ASCE" Clean Water Testing using 98% DO saturation for LWA-1.5 weighted fine bubble tubing**



Independent Testing Performed By Dr. Michael Stenstrom (Former Federal EPA Oxygen Chairman). All Testing Performed In Accordance With ASCE (American Society of Civil Engineers) Standards.

**Air Diffusion Systems Wire-Drawn Horsepower at different motor efficiencies for LWA-1.5 weighted fine bubble tubing**

Table 1. Summary of Test Results

Test	Water Depth (ft)	Diffuser Slits	Air Flow (SCFM)	$K_L A$ ( $hr^{-1}$ )	$C^*_{\infty}$ (mg/L)	SOTE (%)	SOTR (lb/hr)	de (ft)	SAE (60%)	SAE (70%)	SAE (80%)	SAE (Brake HP)
4	15	14	0.0236	2.73	10.61	46.3	0.0113	5.6	9.2	10.8	12.3	15.4
1	15	14	0.0472	5.52	10.67	47.1	0.0230	5.8	9.1	10.6	12.2	15.2
2	15	14	0.0472	5.53	10.67	47.1	0.0230	5.8				
3	15	14	0.0472	5.49	10.79	47.4	0.0232	6.2				
5	15	14	0.0944	6.76	10.75	29.1	0.0285	6.1	5.4	6.3	7.2	9.0
12	10	14	0.0236	2.86	10.04	30.5	0.0075	3.5	7.8	9.2	10.5	13.1
9	10	14	0.0472	4.35	10.08	23.3	0.0114	3.6	5.7	6.7	7.6	9.5
10	10	14	0.0472	4.34	10.06	23.2	0.0114	3.5				
11	10	14	0.0472	4.27	10.06	22.9	0.0112	3.6				
13	10	14	0.0944	6.33	10.13	17.1	0.0167	3.8	4.0	4.7	5.3	6.7
23	5	14	0.0236	3.38	9.560	17.6	0.0043	1.7	6.6	7.7	8.8	11.0
20	5	14	0.0472	5.27	9.489	13.3	0.0065	1.5	4.6	5.4	6.2	7.7
21	5	14	0.0472	5.24	9.473	13.2	0.0065	1.4				
22	5	14	0.0472	5.08	9.526	12.9	0.0063	1.6				
24	5	14	0.0944	7.45	9.525	9.7	0.0095	1.6	3.2	3.7	4.2	5.3
6	15	6	0.02025	2.01	10.94	41.1	0.0086	6.8	8.6	10.0	11.4	14.3
7	15	6	0.02025	2.23	10.93	45.5	0.0095	6.7				
8	15	6	0.02025	2.11	10.90	42.9	0.0090	6.6				
14	10	6	0.02025	2.42	10.18	30.6	0.0064	4.0	7.7	9.0	10.3	12.9
15	10	6	0.02025	2.35	10.16	29.6	0.0062	3.9				
16	10	6	0.02025	2.37	10.17	29.9	0.0063	3.9				
17	5	6	0.02025	2.64	9.504	15.6	0.0033	1.5	5.8	6.8	7.7	9.6
18	5	6	0.02025	2.61	9.507	15.4	0.0032	1.5				
19	5	6	0.02025	2.61	9.463	15.4	0.0032	1.4				

All data was analyzed using the ASCE Standard recommended procedures. In fact, the example Visual Basic/Excel program referenced in the Standard was used. (available for download at [fields.seas.ucla.edu](http://fields.seas.ucla.edu)).

## TEST RESULTS

The graph shows Standard Oxygen Transfer Rates (SOTE, as defined by the ASCE Standard, which is the mass transfer efficiency at standard conditions: 0 mg/L DO, 20°C, tap water, 760 mm Hg, etc.) for LWA1.5 tubing. The efficiency is approximately 3% per foot. The replicate test results at the 5-foot depth are so similar that the 3 symbols appear as a single symbol. At the 15-foot depth, greater variation is observed. The straight line on the graph is a best-fit, least squares regression of the test results. It is provided for convenience in scaling for different depths.