

## ASCE OXYGEN TRANSFER DETERMINATION

**PROJECT:** Colorite [AeroTube] - Diffused Air - 1 HP

**DATE:** 4-Jan-07

**RUN:** 2 - 5,000 mg/L NaCl

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	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.348	14.348	14.346	C' Air Flow Device 1 (Annubar)	1,521.71
(mm Hg)	742.00	742.00	741.90	Air Flow Device 1 (SCFM)	89.13
Ambient Temperature (°F)	59.40	59.50	60.30	C' Air Flow Device 2 (Orifice)	249.76
Relative Humidity (%)	63%	62%	61%	Air Flow Device 2 (SCFM)	89.09
Line Pressure (PSIG)	2.480	2.480	2.480	TDS Water Density @ 20°C (kg/m³)	1,002.44
(In. Hg)	5.05	5.05	5.05	Standard Density @ 20°C (kg/m³)	998.23
Line Temperature (°F)	90.00	91.00	92.00	Temp. Correction Factor (τ)	1.24
ΔH Air Flow Dev. 1 (Annubar)	0.115	0.112	0.110	Pressure Correction Factor (Ω)	0.98
ΔH Air Flow Dev. 2 (Orifice)	4.200	4.200	4.100	Average Air Flow (SCFM)	89.11
C <sub>sm</sub> T (Standard Methods, mg/l at 0 TDS)		11.247	β (C* <sub>20TDS</sub> /C* <sub>20CW</sub> )	Effective Depth Correction (f)	0.35
C* <sub>20</sub> (mg/L at 0 TDS)		9.291	<b>0.962</b>	Headloss (In. H <sub>2</sub> O)	15.00
Water Temp. (°C)	10.11	10.16	10.19	C* (mg/l)	10.80
Orifice Diameter (in)		1.840		C <sub>sm</sub> T (Standard Methods, mg/l at test TDS))	10.82
Number Of Aeration Devices		217		C* <sub>20</sub> (mg/L at Test TDS)	8.94
Side Water Depth (ft)		4.00	(1.22 m)	Tank Volume (Ft³)	1,385.4
Air Release Depth (ft)		2.13	(0.65 m)	(Gallons)	10,363.8
Tank Length (ft)		0.00	(0.00 m)	(m³)	39.2
Tank Width (ft)		0.00	(0.00 m)	(Million Pounds)	0.087
Tank Diameter (ft)		21.00	(6.40 m)	#Na <sub>2</sub> SO <sub>3</sub> @ 840% Stoichiometric	62.12
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concn. (mg/l)	0.100
Motor Efficiency		85.0%		Grams Cobalt Chloride	16.2
Blower HP <sub>wire</sub>		1.15	(0.86 kw)	Blower HP <sub>motor</sub>	0.98
Total HP <sub>wire</sub> av.		1.15	(0.86 kw)	Total HP <sub>motor</sub> av.	0.98
Actual Air Flow (ACFM)		81.52		TDS (mg/L)	5,541.00

### NON-LINEAR REGRESSION RESULTS

Probe	K <sub>La</sub> r	K <sub>La</sub> 20	SOTR	SOTR/Dev	SOTE	SAE <sub>wire</sub>	C*	Std. Err.
1	8.20	10.36	8.28	0.04	8.97	7.20	10.72	0.0830
2	7.64	9.65	7.81	0.04	8.46	6.79	10.85	0.1748
3	7.52	9.50	7.66	0.04	8.30	6.66	10.80	0.0779
4	7.18	9.07	7.32	0.03	7.93	6.36	10.82	0.0581
avg.	7.64	9.64	7.77	0.04	8.41	6.75	10.80	0.0985
Avg	7.58	9.57	7.72	0.04	8.36	6.71	10.81	Exclude Max&Min
	/hr	/hr	#O <sub>2</sub> /hr		%	#O <sub>2</sub> /hr-WHP		

OXYGEN TRANSFER									
Total SCFM:	89.1	143.267	:Nm <sup>3</sup> /Hr	42.057	L/s	#O <sub>2</sub> /Hr:	7.68	3.485	:KgO <sub>2</sub> /Hr
SCFM/Diff.:	0.41	0.660	:Nm <sup>3</sup> /hr/Diff			#O <sub>2</sub> /Hr/Diff.:	0.04	0.016	:KgO <sub>2</sub> /Hr/Diff.
SCFM/KCF:	64.3	3.652	:Nm <sup>3</sup> /hr/m <sup>3</sup>			#O <sub>2</sub> /Day:	184.4	83.6	:KgO <sub>2</sub> /Day
Total ICFM:	95.6	45.10	L/s			#O <sub>2</sub> /Day/1000 Ft <sup>3</sup> :	133	2.13	:KgO <sub>2</sub> /Day/m <sup>3</sup>

### LINEAR REGRESSION RESULTS

Probe	K <sub>La</sub> r	K <sub>La</sub> 20	SOTR	SOTR/Dev	SOTE	SAE <sub>wire</sub>	C*	Corr.Coeff.
1	7.67	9.69	7.77	0.04	8.42	6.75	10.75	0.9945
2	7.67	9.68	7.82	0.04	8.47	6.79	10.82	0.9918
3	7.37	9.31	7.49	0.03	8.12	6.51	10.78	0.9985
4	7.17	9.05	7.31	0.03	7.91	6.35	10.82	0.9990
avg.	7.47	9.43	7.60	0.04	8.23	6.60	10.79	0.9960
Avg	7.52	9.50	7.66	0.04	8.29	6.65	10.80	Exclude Max&Min
	/hr	/hr	#O <sub>2</sub> /hr		%	#O <sub>2</sub> /hr-HPw		

### EUROPEAN STANDARD

Probe	K <sub>La</sub> r	K <sub>La</sub> 20	SOTR	SOTR/Dev	SAE	C*	
1	7.93	10.02	3.64	0.02	4.24	10.72	
2	7.65	9.67	3.55	0.02	4.14	10.85	
3	7.45	9.41	3.45	0.02	4.02	10.80	
4	7.18	9.06	3.32	0.02	3.87	10.82	
avg.	7.55	9.54	3.49	0.02	4.07	10.80	
Avg	7.55	9.54	3.50	0.02	4.08	10.81	Exclude Max&Min
	/hr	/hr	kg O <sub>2</sub> /hr		kg O <sub>2</sub> /hr-kw	mg/L	