

ASCE OXYGEN TRANSFER DETERMINATION

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

DATE: 4-Jan-07

RUN: 3 - 10,000 mg/L NaCl

599 Waldron Rd.
LaVergne, TN 37086
615/793-7547
FAX 615/793/5070

	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.282	14.282	14.282	C' Air Flow Device 1 (Annubar)	1,520.44
(mm Hg)	738.60	738.60	738.60	Air Flow Device 1 (SCFM)	89.22
Ambient Temperature (°F)	61.90	62.20	62.80	C' Air Flow Device 2 (Orifice)	249.55
Relative Humidity (%)	61%	61%	61%	Air Flow Device 2 (SCFM)	89.15
Line Pressure (PSIG)	2.456	2.456	2.480	TDS Water Density @ 20°C (kg/m³)	1,006.30
(In. Hg)	5.00	5.00	5.05	Standard Density @ 20°C (kg/m³)	998.23
Line Temperature (°F)	100.00	97.00	96.00	Temp. Correction Factor (τ)	1.23
ΔH Air Flow Dev. 1 (Annubar)	0.120	0.110	0.114	Pressure Correction Factor (Ω)	0.97
ΔH Air Flow Dev. 2 (Orifice)	4.250	4.200	4.300	Average Air Flow (SCFM)	89.19
C _{sm} T (Standard Methods, mg/l at 0 TDS)		11.170	β (C ^{*20TDS} /C ^{*20CW})	Effective Depth Correction (f)	0.35
C* ₂₀ (mg/L at 0 TDS)		9.292	0.928	Headloss (In. H ₂ O)	15.00
Water Temp. (°C)	10.38	10.46	10.50	C* (mg/l)	10.30
Orifice Diameter (in)		1.840		C _{sm} T (Standard Methods, mg/l at test TDS))	10.37
Number Of Aeration Devices		217		C* ₂₀ (mg/L at Test TDS)	8.63
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 ₂ SO ₃ @ 840% Stoichiometric	59.51
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concn. (mg/l)	0.100
Motor Efficiency		85.0%		Grams Cobalt Chloride	16.3
Blower HP _{wire}		1.16	(0.86 kw)	Blower HP _{motor}	0.98
Total HP _{wire} av.		1.16	(0.86 kw)	Total HP _{motor} av.	0.98
Actual Air Flow (ACFM)		83.07		TDS (mg/L)	10,640.00

NON-LINEAR REGRESSION RESULTS

Probe	K _{La1}	K _{La20}	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Std. Err.
1	9.00	11.29	9.13	0.04	9.88	7.89	10.30	0.0868
2	9.54	11.97	9.68	0.04	10.48	8.37	10.31	0.1693
3	9.26	11.62	9.40	0.04	10.17	8.13	10.30	0.0939
4	9.26	11.62	9.39	0.04	10.17	8.12	10.30	0.2562
avg.	9.27	11.62	9.40	0.04	10.17	8.13	10.30	0.1515
Avg	9.26	11.62	9.40	0.04	10.17	8.12	10.30	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-WHP		

OXYGEN TRANSFER									
Total SCFM:	89.2	143.385	:Nm ³ /Hr	42.091	L/s	#O ₂ /Hr:	9.28	4.208	:KgO ₂ /Hr
SCFM/Diff.:	0.41	0.661	:Nm ³ /hr/Diff			#O ₂ /Hr/Diff.:	0.04	0.019	:KgO ₂ /Hr/Diff.
SCFM/KCF:	64.4	3.655	:Nm ³ /hr/m ³			#O ₂ /Day:	222.7	101.0	:KgO ₂ /Day
Total ICFM:	97.3	45.94	L/s			#O ₂ /Day/1000 Ft ³ :	161	2.57	:KgO ₂ /Day/m ³

LINEAR REGRESSION RESULTS

Probe	K _{La1}	K _{La20}	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	8.64	10.84	8.79	0.04	9.51	7.60	10.33	0.9968
2	9.48	11.90	9.62	0.04	10.41	8.32	10.30	0.9939
3	8.92	11.19	9.08	0.04	9.83	7.85	10.34	0.9971
4	9.00	11.28	9.12	0.04	9.87	7.89	10.30	0.9875
avg.	9.01	11.30	9.15	0.04	9.91	7.92	10.32	0.9938
Avg	8.96	11.23	9.10	0.04	9.85	7.87	10.32	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

EUROPEAN STANDARD

Probe	K _{La1}	K _{La20}	SOTR	SOTR/Dev	SAE	C*
1	8.82	11.06	4.06	0.02	4.71	10.30
2	9.51	11.93	4.39	0.02	5.09	10.31
3	9.09	11.40	4.19	0.02	4.86	10.30
4	9.13	11.45	4.21	0.02	4.88	10.30
avg.	9.14	11.46	4.21	0.02	4.88	10.30
Avg	9.11	11.43	4.20	0.02	4.87	10.30
	/hr	/hr	kg O ₂ /hr		kg O ₂ /hr-kw	mg/L

OXYGEN TRANSFER AT TEST 10640 mg/L TDS CONCENTRATION

Average	K _{La1}	K _{La20}	OTR	OTR/Dev	OTE	AE _{wire}	C*
	9.138	11.46	8.55	0.04	9.26	7.40	10.30
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw	