

ASCE OXYGEN TRANSFER DETERMINATION

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

DATE: 5-Jan-07

RUN: 7 - 30,000 mg/L NaCl

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	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.164	14.164	14.174	C' Air Flow Device 1 (Annubar)	1,514.43
(mm Hg)	732.50	732.50	733.00	Air Flow Device 1 (SCFM)	88.51
Ambient Temperature (°F)	66.70	66.70	66.70	C' Air Flow Device 2 (Orifice)	248.56
Relative Humidity (%)	69%	69%	69%	Air Flow Device 2 (SCFM)	88.49
Line Pressure (PSIG)	2.456	2.456	2.456	TDS Water Density @ 20°C (kg/m³)	1,020.22
(In. Hg)	5.00	5.00	5.00	Standard Density @ 20°C (kg/m³)	998.23
Line Temperature (°F)	102.00	99.00	98.00	Temp. Correction Factor (τ)	1.18
ΔH Air Flow Dev. 1 (Annubar)	0.120	0.115	0.110	Pressure Correction Factor (Ω)	0.96
ΔH Air Flow Dev. 2 (Orifice)	4.350	4.250	4.200	Average Air Flow (SCFM)	88.50
C _{sm} T (Standard Methods, mg/l at 0 TDS)		10.741	β (C [*] _{20TDS} /C [*] _{20CW})	Effective Depth Correction (f)	0.35
C* ₂₀ (mg/L at 0 TDS)		9.424	0.808	Headloss (In. H ₂ O)	15.00
Water Temp. (°C)	12.07	12.17	12.20	C* (mg/l)	8.68
Orifice Diameter (in)		1.840		C _{sm} T (Standard Methods, mg/l at test TDS))	8.80
Number Of Aeration Devices		217		C* ₂₀ (mg/L at Test TDS)	7.61
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)	0.088
Tank Diameter (ft)		21.00	(6.40 m)	#Na ₂ SO ₃ @ 450% Stoichiometric	27.22
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concn. (mg/l)	0.100
Motor Efficiency		85.0%		Grams Cobalt Chloride	16.5
Blower HP _{wire}		1.16	(0.86 kw)	Blower HP _{motor}	0.99
Total HP _{wire} av.		1.16	(0.86 kw)	Total HP _{motor} av.	0.99
Actual Air Flow (ACFM)		83.65		TDS (mg/L)	29,003.50

NON-LINEAR REGRESSION RESULTS

Probe	Kla _r	Kla ₂₀	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Std. Err.
1	13.38	16.12	13.40	0.06	14.61	11.56	8.67	0.0296
2	13.29	16.02	13.27	0.06	14.48	11.45	8.65	0.0631
3	13.19	15.89	13.23	0.06	14.43	11.42	8.69	0.0513
4	12.74	15.34	12.79	0.06	13.95	11.04	8.70	0.0673
avg.	13.15	15.84	13.17	0.06	14.37	11.37	8.68	0.0528
Avg	13.24	15.95	13.27	0.06	14.47	11.45	8.68	Exclude Max&Min
TDS	0.88	1.06	0.88	0.00	0.96	0.76	8.68	0.45%
Corrected	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-WHP		

OXYGEN TRANSFER

Total SCFM:	88.5	142.280	:Nm ³ /Hr	41.767	L/s	#O ₂ /Hr:	13.14	5.961	:KgO ₂ /Hr
SCFM/Diff.:	0.41	0.656	:Nm ³ /hr/Diff			#O ₂ /Hr/Diff.:	0.06	0.027	:KgO ₂ /Hr/Diff.
SCFM/KCF:	63.9	3.627	:Nm ³ /hr/m ³			#O ₂ /Day:	315.4	143.1	:KgO ₂ /Day
Total ICFM:	98.1	46.30	L/s			#O ₂ /Day/1000 Ft ³ :	228	3.65	:KgO ₂ /Day/m ³

LINEAR REGRESSION RESULTS

Probe	Kla _r	Kla ₂₀	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	13.16	15.85	13.22	0.06	14.42	11.40	8.70	0.9992
2	12.76	15.38	12.82	0.06	13.98	11.06	8.70	0.9974
3	13.34	16.07	13.37	0.06	14.58	11.53	8.68	0.9989
4	12.94	15.59	13.04	0.06	14.22	11.25	8.72	0.9965
avg.	13.05	15.72	13.11	0.06	14.30	11.31	8.70	0.9980
Avg	13.05	15.72	12.93	0.06	14.10	11.16	8.70	Exclude Max&Min
TDS	0.88	1.05	0.87	0.00	0.95	0.75	8.70	
Corrected	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

EUROPEAN STANDARD

Probe	Kla _r	Kla ₂₀	SOTR	SOTR/Dev	SAE	C*
1	13.27	15.99	5.91	0.03	6.83	8.67
2	13.03	15.70	5.78	0.03	6.69	8.65
3	13.26	15.98	5.92	0.03	6.84	8.69
4	12.84	15.47	5.73	0.03	6.63	8.70
avg.	13.10	15.78	5.84	0.03	6.75	8.68
Avg	13.15	15.84	5.86	0.03	6.76	8.68
TDS	0.88	0.84	0.39	0.00	0.45	8.68
Corrected	/hr	/hr	kg O ₂ /hr		kg O ₂ /hr-kw	mg/L