

ASCE OXYGEN TRANSFER DETERMINATION

PROJECT: Colorite - Paddle Wheel - 1 HP

DATE: 8-Jan-07

RUN: 10 - 35,000 mg/L NaCl

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	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.352	14.352	14.352	C' Air Flow Device 1 (Annubar)	NA
(mm Hg)	742.20	742.20	742.20	Air Flow Device 1 (SCFM)	NA
Ambient Temperature (°F)	60.60	60.10	59.20	C' Air Flow Device 2 (Orifice)	NA
Relative Humidity (%)	44%	44%	44%	Air Flow Device 2 (SCFM)	NA
Line Pressure (PSIG)	NA	NA	NA	TDS Water Density @ 20°C (kg/m³)	1,024.18
(In. Hg)	NA	NA	NA	Standard Density @ 20°C (kg/m³)	998.23
Line Temperature (°F)	NA	NA	NA	Temp. Correction Factor (τ)	1.21
ΔH Air Flow Dev. 1 (Annubar)	NA	NA	NA	Pressure Correction Factor (Ω)	0.98
ΔH Air Flow Dev. 2 (Orifice)	NA	NA	NA	Average Air Flow (SCFM)	NA
C _{sm} T (Standard Methods, mg/l at 0 TDS))		11.017	β (C' 20TDS/C' 20CW)	Effective Depth Correction (f)	0.00
C* ₂₀ (mg/L at 0 TDS)		9.091	0.789	Headloss (In. H ₂ O)	15.00
Water Temp. (°C)	11.25	11.06	10.81	C* (mg/l)	8.48
Orifice Diameter (in)		1.840		C _{sm} T (Standard Methods, mg/l at test TDS))	8.69
Number Of Aeration Devices		217		C* ₂₀ (mg/L at Test TDS)	7.17
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)	0.089
Tank Diameter (ft)		21.00	(6.40 m)	#Na ₂ SO ₃ @ 160% Stoichiometric	9.50
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concen. (mg/l)	0.100
Motor Efficiency		80.0%		Grams Cobalt Chloride	16.6
Blower HP _{wire}		1.50	(1.12 kw)	Blower HP _{motor}	0.00
Total HP _{wire} av.		1.50	(1.12 kw)	Total HP _{motor} av.	1.20
Actual Air Flow (ACFM)		NA		TDS (mg/L)	34,200.00

NON-LINEAR REGRESSION RESULTS

Probe	Kla ₁	Kla ₂₀	SOTR	SOTR/Dev	SAEmotor	SAE _{wire}	C*	Std. Err.
1	4.26	5.27	4.32	0.02	3.59	2.87	8.64	0.0424
2	4.39	5.43	4.38	0.02	3.64	2.91	8.48	0.0221
3	4.42	5.47	4.40	0.02	3.66	2.92	8.47	0.0204
4	4.74	5.86	4.63	0.02	3.84	3.08	8.31	0.0843
5	4.35	5.38	4.33	0.02	3.60	2.88	8.47	0.0690
6	4.33	5.35	4.33	0.02	3.60	2.88	8.51	0.0454
avg.	4.42	5.46	4.40	0.02	3.65	2.92	8.48	0.0473
Avg	4.37	5.41	4.36	0.02	3.62	2.90	8.48	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		#O ₂ /hr-HPm	#O ₂ /hr-WHP		

OXYGEN TRANSFER									
Total SCFM:	NA	NA	:Nm ³ /Hr	#VALUE!	L/s	#O ₂ /Hr:	4.40	1.995	:KgO ₂ /Hr
SCFM/Diff.:	NA	NA	:Nm ³ /hr/Diff			#O ₂ /Hr/Diff.:	0.02	0.009	:KgO ₂ /Hr/Diff.
SCFM/KCF:	NA	NA	:Nm ³ /hr/m ³			#O ₂ /Day:	105.6	47.9	:KgO ₂ /Day
Total ICFM:	#DIV/0!	#DIV/0!	L/s		#O ₂ /Day/1000 Ft ³ :	76	1.22		:KgO ₂ /Day/m ³

LINEAR REGRESSION RESULTS

Probe	Kla ₁	Kla ₂₀	SOTR	SOTR/Dev	SAEmotor	SAE _{wire}	C*	Corr.Coeff.
1	4.26	5.27	4.29	0.02	3.57	2.85	8.58	0.9992
2	4.46	5.52	4.43	0.02	3.68	2.94	8.44	0.9998
3	4.48	5.55	4.44	0.02	3.69	2.95	8.44	0.9998
4	4.47	5.53	4.39	0.02	3.65	2.92	8.37	0.9976
5	4.51	5.57	4.45	0.02	3.69	2.96	8.40	0.9990
6	4.40	5.44	4.40	0.02	3.66	2.92	8.51	0.9991
avg.	4.43	5.48	4.40	0.02	3.66	2.93	8.46	0.9991
Avg	4.45	5.51	4.42	0.02	3.67	2.94	8.45	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		#O ₂ /hr-HPm	#O ₂ /hr-HPw		

EUROPEAN STANDARD

Probe	Kla ₁	Kla ₂₀	SOTR	SOTR/Dev	SAE	C*
1	4.26	5.27	1.91	0.01	1.71	8.64
2	4.43	5.48	1.95	0.01	1.74	8.48
3	4.45	5.51	1.96	0.01	1.75	8.47
4	4.60	5.69	1.99	0.01	1.77	8.31
5	4.43	5.48	1.95	0.01	1.74	8.47
6	4.37	5.40	1.93	0.01	1.72	8.51
avg.	4.42	5.47	1.95	0.01	1.74	8.48
Avg	4.42	5.46	1.95	0.01	1.74	8.48
	/hr	/hr	kg O ₂ /hr		kg O ₂ /hr-kw	mg/L

OXYGEN TRANSFER AT TEST 34200 mg/L TDS CONCENTRATION

Average	Kla ₁	Kla ₂₀	OTR	OTR/Dev	OTE	AE _{wire}	C*
	4.423	5.47	3.39	0.02	2.82	2.26	8.48
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw	