

ASCE OXYGEN TRANSFER DETERMINATION

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

DATE: 12-Jan-07

RUN: 14

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	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.429	14.429	14.429	C' Air Flow Device 1 (Annubar)	1,523.34
(mm Hg)	746.20	746.20	746.20	Air Flow Device 1 (SCFM)	90.43
Ambient Temperature (°F)	62.60	63.00	63.10	C' Air Flow Device 2 (Orifice)	250.03
Relative Humidity (%)	51%	51%	50%	Air Flow Device 2 (SCFM)	90.10
Line Pressure (PSIG)	2.333	2.333	2.333	TDS Water Density @ 20°C (kg/m³)	998.89
(In. Hg)	4.75	4.75	4.75	Standard Density @ 20°C (kg/m³)	998.23
Line Temperature (°F)	95.00	95.00	95.00	Temp. Correction Factor (τ)	1.20
ΔH Air Flow Dev. 1 (Annubar)	0.120	0.110	0.120	Pressure Correction Factor (Ω)	0.98
ΔH Air Flow Dev. 2 (Orifice)	4.300	4.300	4.300	Average Air Flow (SCFM)	90.26
C _{sm} T (Standard Methods, mg/l at 0 TDS))		10.906	β (C _{20TDS} /C _{20CW})	Effective Depth Correction (f)	0.35
C* ₂₀ (mg/L at 0 TDS)		9.297	0.994	Headloss (In. H ₂ O)	15.00
Water Temp. (°C)	11.43	11.50	11.51	C* (mg/l)	10.89
Orifice Diameter (in)		1.840		C _{sm} T (Standard Methods, mg/l at test TDS))	10.84
Number Of Aeration Devices		217		C* ₂₀ (mg/L at Test TDS)	9.24
Side Water Depth (ft)		4.04	(1.23 m)	Tank Volume (Ft³)	1,399.9
Air Release Depth (ft)		2.17	(0.66 m)	(Gallons)	10,471.8
Tank Length (ft)		0.00	(0.00 m)	(m³)	39.6
Tank Width (ft)		0.00	(0.00 m)	(Million Pounds)	0.087
Tank Diameter (ft)		21.00	(6.40 m)	#Na ₂ SO ₃ @ 200% Stoichiometric	15.01
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concen. (mg/l)	0.100
Motor Efficiency		85.0%		Grams Cobalt Chloride	16.3
Blower HP _{wire}		1.17	(0.87 kw)	Blower HP _{motor}	0.99
Total HP _{wire} av.		1.17	(0.87 kw)	Total HP _{motor} av.	0.99
Actual Air Flow (ACFM)		83.55		TDS (mg/L)	853.00

NON-LINEAR REGRESSION RESULTS

Probe	KLa _{1r}	KLa ₂₀	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Std. Err.
1	6.16	7.54	6.26	0.03	6.70	5.35	11.14	0.0914
2	6.26	7.66	6.21	0.03	6.64	5.31	10.87	0.0461
3	6.32	7.73	6.24	0.03	6.68	5.34	10.83	0.0478
4	6.07	7.43	5.96	0.03	6.37	5.09	10.76	0.0620
5	6.33	7.75	6.23	0.03	6.66	5.33	10.78	0.0420
6	6.33	7.74	6.31	0.03	6.75	5.39	10.93	0.0395
avg.	6.24	7.64	6.20	0.03	6.63	5.30	10.89	0.0548
Avg	6.27	7.67	6.21	0.03	6.64	5.31	10.85	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-WHP		

* OXYGEN TRANSFER *									
Total SCFM:	90.3	145.119	:Nm ³ /Hr	42.600	L/s	#O ₂ /Hr:	6.19	2.810	:KgO ₂ /Hr
SCFM/Diff.:	0.42	0.669	:Nm ³ /hr/Diff			#O ₂ /Hr/Diff.:	0.03	0.013	:KgO ₂ /Hr/Diff.
SCFM/KCF:	64.5	3.661	:Nm ³ /hr/m ³			#O ₂ /Day:	148.7	67.4	:KgO ₂ /Day
Total ICFM:	97.0	45.78	L/s			#O ₂ /Day/1000 Ft ³ :	106	1.70	:KgO ₂ /Day/m ³

LINEAR REGRESSION RESULTS

Probe	KLa _{1r}	KLa ₂₀	SOTR	SOTR/Dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	6.10	7.46	6.19	0.03	6.62	5.29	11.13	0.9958
2	6.34	7.75	6.28	0.03	6.71	5.37	10.86	0.9995
3	6.37	7.80	6.29	0.03	6.73	5.38	10.81	0.9997
4	5.99	7.33	5.88	0.03	6.29	5.03	10.76	0.9982
5	6.32	7.74	6.22	0.03	6.65	5.32	10.78	0.9995
6	6.28	7.69	6.27	0.03	6.70	5.36	10.93	0.9994
avg.	6.23	7.63	6.19	0.03	6.62	5.29	10.88	0.9987
Avg	6.26	7.66	6.20	0.03	6.63	5.30	10.85	Exclude Max&Min
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

EUROPEAN STANDARD

Probe	KLa _{1r}	KLa ₂₀	SOTR	SOTR/Dev	SAE	C*	
1	6.13	7.50	2.83	0.01	3.25	11.14	
2	6.30	7.71	2.84	0.01	3.26	10.87	
3	6.35	7.77	2.85	0.01	3.27	10.83	
4	6.03	7.38	2.69	0.01	3.08	10.76	
5	6.33	7.74	2.83	0.01	3.24	10.78	
6	6.31	7.72	2.86	0.01	3.28	10.93	
avg.	6.24	7.64	2.82	0.01	3.23	10.89	
Avg	6.26	7.67	2.82	0.01	3.25	10.85	Exclude Max&Min
	/hr	/hr	kg O ₂ /hr		kg O ₂ /hr-kw	mg/L	

OXYGEN TRANSFER AT TEST 853 mg/L TDS CONCENTRATION

Average	KLa _{1r}	KLa ₂₀	OTR	OTR/Dev	OTE	AE _{wire}	C*
	6.239	7.64	6.17	0.03	6.60	5.27	10.89
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw	