

***Calibration Data***



# Airtech Environmental Services

## Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/10/2011
Highest Field Vacuum (inches Hg)	10	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.786	Meter ID	M-5

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	26.00	29.93	33.85
Final Volume (ft <sup>3</sup> )	29.93	33.85	37.78
Volume Metered (ft <sup>3</sup> )	3.93	3.92	3.93
DGM Inlet Temperature (°F)	87	88	90
DGM Outlet Temperature (°F)	80	82	82
Average DGM Temperature (°F)	83.5	85.0	86.0
Ambient Temperature (°F)	74	75	76
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	2.00	2.00	2.00
Barometric Pressure (inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	20	20	20
K'	0.5885	0.5885	0.5885
Vcr (ft <sup>3</sup> )	3.756	3.753	3.749
Vmstd (ft <sup>3</sup> )	3.782	3.762	3.764
Post Test Yc	0.9933	0.9977	0.9960
Full Test Yd	0.9953	0.9953	0.9953
% Difference	0.20	-0.24	-0.07
<b>Average % Difference</b>			<b>-0.04</b>



## Airtech Environmental Services Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/9/2011
Highest Field Vacuum (Inches Hg)	10	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.76	Meter ID	M-14

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	105.00	108.80	112.67
Final Volume (ft <sup>3</sup> )	108.80	112.67	116.51
Volume Metered (ft <sup>3</sup> )	3.80	3.87	3.84
DGM Inlet Temperature (°F)	91	92	92
DGM Outlet Temperature (°F)	85	86	86
Average DGM Temperature (°F)	88.0	89.0	89.0
Ambient Temperature (°F)	90	90	90
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	1.80	1.80	1.80
Barometric Pressure (Inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	18	18	18
K'	0.5885	0.5885	0.5885
V <sub>cr</sub> (ft <sup>3</sup> )	3.701	3.701	3.701
V <sub>mstd</sub> (ft <sup>3</sup> )	3.625	3.685	3.656
Post Test Yc	1.0211	1.0045	1.0124
Full Test Yd	1.0087	1.0087	1.0087
% Difference	-1.23	0.42	-0.36
<b>Average % Difference</b>			<b>-0.39</b>



## Airtech Environmental Services Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/9/2011
Highest Field Vacuum (inches Hg)	10	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.75	Meter ID	M-15

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	174.50	178.25	182.02
Final Volume (ft <sup>3</sup> )	178.25	182.02	185.78
Volume Metered (ft <sup>3</sup> )	3.75	3.77	3.76
DGM Inlet Temperature (°F)	85	86	87
DGM Outlet Temperature (°F)	79	80	80
Average DGM Temperature (°F)	82.0	83.0	83.5
Ambient Temperature (°F)	85	85	85
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	1.80	1.80	1.80
Barometric Pressure (inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	19	19	19
K'	0.5885	0.5885	0.5885
V <sub>cr</sub> (ft <sup>3</sup> )	3.718	3.718	3.718
V <sub>mstd</sub> (ft <sup>3</sup> )	3.617	3.629	3.616
Post Test Y <sub>c</sub>	1.0281	1.0246	1.0282
Full Test Y <sub>d</sub>	1.0159	1.0159	1.0159
% Difference	-1.20	-0.85	-1.21
<b>Average % Difference</b>			<b>-1.09</b>





## Airtech Environmental Services Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/9/2011
Highest Field Vacuum (inches Hg)	10	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.772	Meter ID	M-16

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	627.50	631.36	635.21
Final Volume (ft <sup>3</sup> )	631.36	635.21	639.08
Volume Metered (ft <sup>3</sup> )	3.86	3.85	3.87
DGM Inlet Temperature (°F)	86	87	88
DGM Outlet Temperature (°F)	82	82	82
Average DGM Temperature (°F)	84.0	84.5	85.0
Ambient Temperature (°F)	88	87	87
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	1.80	1.80	1.80
Barometric Pressure (inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	20	20	20
K'	0.5885	0.5885	0.5885
V <sub>cr</sub> (ft <sup>3</sup> )	3.708	3.711	3.711
V <sub>mstd</sub> (ft <sup>3</sup> )	3.709	3.696	3.712
Post Test Y <sub>c</sub>	0.9998	1.0042	0.9999
Full Test Y <sub>d</sub>	0.9907	0.9907	0.9907
% Difference	-0.91	-1.36	-0.93
<b>Average % Difference</b>			<b>-1.07</b>



## Airtech Environmental Services Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/8/2011
Highest Field Vacuum (inches Hg)	10	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.754	Meter ID	M-17

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	267.50	271.27	275.05
Final Volume (ft <sup>3</sup> )	271.27	275.05	278.81
Volume Metered (ft <sup>3</sup> )	3.77	3.78	3.76
DGM Inlet Temperature (°F)	93	93	94
DGM Outlet Temperature (°F)	86	86	87
Average DGM Temperature (°F)	89.5	89.5	90.5
Ambient Temperature (°F)	85	85	86
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	1.80	1.80	1.80
Barometric Pressure (inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	19	19	19
K'	0.5885	0.5885	0.5885
V <sub>cr</sub> (ft <sup>3</sup> )	3.718	3.718	3.715
V <sub>mstd</sub> (ft <sup>3</sup> )	3.586	3.596	3.570
Post Test Y <sub>c</sub>	1.0368	1.0341	1.0405
Full Test Y <sub>d</sub>	1.0141	1.0141	1.0141
% Difference	-2.24	-1.97	-2.60
<b>Average % Difference</b>			<b>-2.27</b>



## Airtech Environmental Services Meter Post Calibration

Average Field Sample Rate ( $\Delta H$ )	1.500	Date	8/8/2011
Highest Field Vacuum (inches Hg)	5	Client	BREC
Critical Orifice ID	AA-63	Project No.	3648
Orifice Flow Rate (cfm)	0.766	Meter ID	M-20

	Run 1	Run 2	Run 3
Initial Volume (ft <sup>3</sup> )	825.60	829.43	833.26
Final Volume (ft <sup>3</sup> )	829.43	833.26	837.08
Volume Metered (ft <sup>3</sup> )	3.83	3.83	3.82
DGM Inlet Temperature (°F)	90	90	90
DGM Outlet Temperature (°F)	84	84	84
Average DGM Temperature (°F)	87.0	87.0	87.0
Ambient Temperature (°F)	90	89	88
Elapsed Time (min.)	5	5	5
$\Delta H$ (inches H <sub>2</sub> O)	1.80	1.80	1.80
Barometric Pressure (inches Hg)	29.5	29.5	29.5
Pump Vacuum (inches Hg)	18	18	18
K'	0.5885	0.5885	0.5885
V <sub>cr</sub> (ft <sup>3</sup> )	3.701	3.705	3.708
V <sub>mstd</sub> (ft <sup>3</sup> )	3.660	3.660	3.650
Post Test Yc	1.0113	1.0122	1.0158
Full Test Yd	0.9952	0.9952	0.9952
% Difference	-1.62	-1.71	-2.07
<b>Average % Difference</b>			<b>-1.80</b>

# Meter Box Full Test Calibration

DATE: 7/8/2011

*M26-*

Operator: Joe Ward

Meter Box No: DB30B-0711-2018		Meter Box H@: 0.0000		Meter Box Yd 0.9958		Barometric Pressure: 29.78											
#1	Standard Meter Gas Volume		Meter Box Gas Volume (ft <sup>3</sup> )		Std. Meter Temperature (PF)		Meter Box Temperature (PF)										
	Q	P	H	Yds	Initial	Final		Vf	Inlet	Outlet	Avg.	Time	Yd	H@			
0.04	-0.30	0.00	1.0000	0.0	1.000	1.000	1.015	1.015	0.000	0.000	0.000	76.0	76.0	81.0	27.04	0.9951	0.0000
0.04	-0.30	0.00	1.0000	0.0	1.000	1.000	1.014	1.014	0.000	0.000	0.000	76.0	76.0	80.0	27.06	0.9943	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.503	.503	.000	.000	.000	77.0	77.0	80.0	29.91	1.0003	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.502	.502	.000	.000	.000	77.0	77.0	80.0	29.52	1.0023	0.0000
0.03	-0.30	0.00	1.0000	0.0	.500	.500	.507	.507	.000	.000	.000	78.0	78.0	81.0	17.92	0.9924	0.0000
0.03	-0.30	0.00	1.0000	0.0	.500	.500	.508	.508	.000	.000	.000	78.0	78.0	81.0	17.79	0.9905	0.0000
<b>AVERAGE</b>												0.9958	0.0000				

Millennium Instruments Inc.  
 2402 Springridge Drive unit A  
 Spring Grove IL. 60081  
 PHONE#(815)675-3225  
 FAX#(815)675-6965  
 E-mail millennium@millinst.com  
 www.millinst.com

### Vacuum Gauge

(in. Hg)	Gauge
5.0	5.5
10.0	10.5
15.0	16.0
20.0	21.0
25.0	26.0

# Meter Box Full Test Calibration

DATE: 7/10/2011

M-26

Operator: Joe Ward

Meter Box No: DB30B-0711-2018		Meter Box H@: 0.0000		Meter Box Yd 0.9902		Barometric Pressure: 29.75							
#2	Standard Meter Gas Volume		Meter Box Gas Volume (ft.)		Std. Meter Temperature (PF)		Meter Box Temperature (PF)						
	Initial	Final	Initial	Final	Inlet	Outlet							
Q	P	H	Yds	Vf	Vf	Inlet	Outlet	Avg.	Time	Yd	H@		
0.01	-0.30	0.00	1.0000	0.0	.280	.280	.280	.294	75.0	75.0	18.66	0.9834	0.0000
0.01	-0.30	0.00	1.0000	0.0	.285	.285	.299	.299	75.0	75.0	18.64	0.9842	0.0000
0.03	-0.30	0.00	1.0000	0.0	1.000	1.000	1.033	1.033	75.0	75.0	29.14	1.0014	0.0000
0.03	-0.30	0.00	1.0000	0.0	1.000	1.000	1.032	1.032	75.0	75.0	29.10	1.0023	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.527	.527	75.0	75.0	22.89	0.9850	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.527	.527	75.0	75.0	22.80	0.9850	0.0000
<b>AVERAGE</b>											<b>0.9902</b>	<b>0.0000</b>	

Millennium Instruments Inc.  
 2402 Springridge Drive unit A  
 Spring Grove IL. 60081  
 PHONE#(815)675-3225  
 FAX#(815)675-6965  
 E-mail millennium@millinst.com  
 www.millinst.com

### Vacuum Gauge

(in. Hg)	Gauge
5.0	5.0
10.0	10.0
15.0	15.0
20.0	20.0

## Pyrometer Calibration Sheet

Pyrometer No.:001

Office: Spring Grove

Client: Airtech Environmental

Job or Reference No.:DB30B-0711-2018

Temperature Scale Used

Fahrenheit  
 Celsius

Full Test  
 Post Test

Calibration Reference Settings for Fahrenheit Scale	Pyrometer Reading	Calibration Reference Settings for Celsius Scale
50° F	50° F	10°C
100° F	100° F	38°C
150° F	150° F	66°C
200° F	200° F	93°C
250° F	250° F	121°C
300° F	300° F	149°C
350° F	350° F	177°C
400° F	400° F	204°C
450° F	450° F	232°C
500° F	500° F	260°C
550° F	550° F	288°C
600° F	600° F	316°C



**Method 30B Post-Test Meter Calibration**

<b>Average Field Sample Rate (lpm)</b>	0.5	<b>Date</b>	8/8/2011
<b>Highest Field Vacuum (inches Hg)</b>	10.0	<b>Client</b>	BREC
<b>Critical Orifice ID</b>	.5LPM	<b>Project No.</b>	3648
<b>Orifice Flow Rate (lpm)</b>	0.479	<b>Meter ID</b>	M-26 A

	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>	
<b>Initial Volume (l<sup>3</sup>)</b>	0.000	4.798	9.564	
<b>Final Volume (l<sup>3</sup>)</b>	4.798	9.564	14.362	
<b>Volume Metered (l<sup>3</sup>)</b>	4.798	4.766	4.798	
<b>DGM Temperature (°F)</b>	104	105	107	
<b>Ambient Temperature (°F)</b>	88	87	88	
<b>Elapsed Time (min.)</b>	10.0	10.0	10.0	
<b>Setting (l/min)</b>	0.4	0.4	0.4	
<b>Barometric Pressure (inches Hg)</b>	29.50	29.50	29.50	
<b>Pump Vacuum (inches Hg)</b>	19.0	19.0	19.0	
<b>K'</b>	0.012	0.012	0.012	
<b>Vcr (l<sup>3</sup>)</b>	4.281	4.285	4.281	
<b>Vmstd (l<sup>3</sup>)</b>	4.431	4.394	4.408	
<b>Post Test Yc</b>	0.96609	0.97519	0.97123	
<b>Full Test Yd</b>	0.9958	0.9958	0.9958	
<b>% Difference</b>	2.98	2.07	2.47	
	<b>Average Difference</b>		<b>2.51</b>	

**Method 30B Post-Test Meter Calibration**

<b>Average Field Sample Rate (lpm)</b>	0.5	<b>Date</b>	8/8/2011
<b>Highest Field Vacuum (inches Hg)</b>	10.0	<b>Client</b>	BREC
<b>Critical Orifice ID</b>	.5LPM	<b>Project No.</b>	3648
<b>Orifice Flow Rate (lpm)</b>	0.480	<b>Meter ID</b>	M-26 B

	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>	
<b>Initial Volume (l<sup>3</sup>)</b>	0.000	4.802	9.592	
<b>Final Volume (l<sup>3</sup>)</b>	4.802	9.592	14.401	
<b>Volume Metered (l<sup>3</sup>)</b>	4.802	4.790	4.809	
<b>DGM Temperature (°F)</b>	106	108	107	
<b>Ambient Temperature (°F)</b>	88	87	88	
<b>Elapsed Time (min.)</b>	10.0	10.0	10.0	
<b>Setting (l/min)</b>	0.4	0.4	0.4	
<b>Barometric Pressure (inches Hg)</b>	29.50	29.50	29.50	
<b>Pump Vacuum (inches Hg)</b>	20.0	20.0	20.0	
<b>K'</b>	0.012	0.012	0.012	
<b>Vcr (l<sup>3</sup>)</b>	4.281	4.285	4.281	
<b>Vmstd (l<sup>3</sup>)</b>	4.419	4.393	4.418	
<b>Post Test Yc</b>	0.96871	0.97546	0.96901	
<b>Full Test Yd</b>	0.9902	0.9902	0.9902	
<b>% Difference</b>	2.17	1.49	2.14	
	<b>Average Difference</b>		<b>1.93</b>	

# Meter Box Full Test Calibration

R-20098

DATE: 7/10/2011 Operator: Joe Ward

Meter Box No: DB30B-0711-2019		Meter Box H@: 0.0000		Meter Box Yd 1.0072		Barometric Pressure: 29.79									
#1	Standard Meter Gas Volume		Meter Box Gas Volume (ft.)		Std. Meter Temperature (PF)		Meter Box Temperature (PF)								
	P	H	Yds	Initial	Final	Vf	Inlet	Outlet	Avg.	Time	Yd	H@			
0.04	-0.30	0.00	1.0000	0.0	1.000	1.018	1.018	75.0	75.0	75.0	91.0	91.0	26.40	1.0124	0.0000
0.04	-0.30	0.00	1.0000	0.0	1.000	1.019	1.019	75.0	75.0	75.0	91.0	91.0	26.38	1.0115	0.0000
0.02	-0.30	0.00	1.0000	0.0	.520	.536	.536	75.0	75.0	75.0	93.0	93.0	22.14	1.0035	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.516	.516	75.0	75.0	75.0	94.0	94.0	22.09	1.0041	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.523	.523	76.0	76.0	76.0	104.0	104.0	32.22	1.0067	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.524	.524	76.0	76.0	76.0	104.0	104.0	32.20	1.0048	0.0000
<b>AVERAGE</b>												<b>1.0072</b>	<b>0.0000</b>		

**Vacuum Gauge**

(in. Hg)	Gauge
5.0	5.5
10.0	10.5
15.0	16.0
20.0	21.0

Millennium Instruments Inc.  
 2402 Springridge Drive unit A  
 Spring Grove IL. 60081  
 PHONE#(815)675-3225  
 FAX#(815)675-6965  
 E-mail millennium@millinst.com  
 www.millinst.com

New Ashtead

R-20078

# Meter Box Full Test Calibration

Operator: Joe Ward

DATE: 7/11/2011

Meter Box No: DB30B-0711-2019		Meter Box H@:		Meter Box Yd		Barometric Pressure:							
		0.0000		0.9985		29.69							
#2	Standard Meter Gas Volume		Meter Box Gas Volume (ft <sup>3</sup> )		Std. Meter Temperature (PF)		Meter Box Temperature (PF)						
	Q	P	H	Yds	Initial	Final	Vf	Inlet	Outlet	Avg.	Time	Yd	H@
0.03	-0.30	0.00	1.0000	0.0	1.000	1.000	1.024	75.0	75.0	75.0	30.56	1.0083	0.0000
0.03	-0.30	0.00	1.0000	0.0	1.000	1.000	1.025	75.0	75.0	75.0	30.48	1.0074	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.518	75.0	75.0	75.0	22.10	1.0003	0.0000
0.02	-0.30	0.00	1.0000	0.0	.500	.500	.518	75.0	75.0	75.0	21.90	1.0003	0.0000
0.01	-0.30	0.00	1.0000	0.0	.500	.500	.528	76.0	76.0	76.0	38.94	0.9866	0.0000
0.01	-0.30	0.00	1.0000	0.0	.500	.500	.527	76.0	76.0	76.0	38.85	0.9884	0.0000
<b>AVERAGE</b>												0.9985	0.0000

### Vacuum Gauge

(in. Hg)	Gauge
5.0	5.0
10.0	10.0
15.0	15.0
20.0	20.0

Millennium Instruments Inc.  
 2402 Springridge Drive unit A  
 Spring Grove IL. 60081  
 PHONE#(815)675-3225  
 FAX#(815)675-6965  
 E-mail millennium@millinst.com  
 www.millinst.com

R-20078

### Pyrometer Calibration Sheet

Pyrometer No.:001

Office: Spring Grove  
Client: Ashtead Technology Rentals  
Job or Reference No.:DB30B-0711-2019

Temperature Scale Used

Fahrenheit  
 Celsius

Full Test  
 Post Test

Calibration Reference Settings for Fahrenheit Scale	Pyrometer Reading	Calibration Reference Settings for Celsius Scale
50° F	50° F	10°C
100° F	100° F	38°C
150° F	150° F	66°C
200° F	200° F	93°C
250° F	250° F	121°C
300° F	300° F	149°C
350° F	350° F	177°C
400° F	400° F	204°C
450° F	450° F	232°C
500° F	500° F	260°C
550° F	550° F	288°C
600° F	600° F	316°C

**Method 30B Post-Test Meter Calibration**

<b>Average Field Sample Rate (lpm)</b>	0.5	<b>Date</b>	8/8/2011
<b>Highest Field Vacuum (inches Hg)</b>	10.0	<b>Client</b>	BREC
<b>Critical Orifice ID</b>	.5LPM	<b>Project No.</b>	3648
<b>Orifice Flow Rate (lpm)</b>	0.473	<b>Meter ID</b>	R-20078A

	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>	
<b>Initial Volume (l<sup>3</sup>)</b>	0.000	4.676	9.411	
<b>Final Volume (l<sup>3</sup>)</b>	4.676	9.411	14.181	
<b>Volume Metered (l<sup>3</sup>)</b>	4.676	4.735	4.770	
<b>DGM Temperature (°F)</b>	106	108	112	
<b>Ambient Temperature (°F)</b>	87	88	88	
<b>Elapsed Time (min.)</b>	10.0	10.0	10.0	
<b>Setting (l/min)</b>	0.4	0.4	0.4	
<b>Barometric Pressure (inches Hg)</b>	29.50	29.50	29.50	
<b>Pump Vacuum (inches Hg)</b>	20.0	20.0	20.0	
<b>K</b>	0.012	0.012	0.012	
<b>Vcr (l<sup>3</sup>)</b>	4.285	4.281	4.281	
<b>Vmsgd (l<sup>3</sup>)</b>	4.303	4.342	4.344	
<b>Post Test Yc</b>	0.99572	0.98589	0.98555	
<b>Full Test Yd</b>	1.0072	1.0072	1.0072	
<b>% Difference</b>	1.14	2.12	2.15	
	<b>Average Difference</b>		<b>1.80</b>	

**Method 30B Post-Test Meter Calibration**

<b>Average Field Sample Rate (lpm)</b>	0.5	<b>Date</b>	8/8/2011
<b>Highest Field Vacuum (inches Hg)</b>	10.0	<b>Client</b>	BREC
<b>Critical Orifice ID</b>	.5LPM	<b>Project No.</b>	3648
<b>Orifice Flow Rate (lpm)</b>	0.487	<b>Meter ID</b>	R-20078B

	<b>Run 1</b>	<b>Run 2</b>	<b>Run 3</b>	
<b>Initial Volume (l<sup>3</sup>)</b>	0.000	4.891	9.779	
<b>Final Volume (l<sup>3</sup>)</b>	4.891	9.779	14.623	
<b>Volume Metered (l<sup>3</sup>)</b>	4.891	4.888	4.844	
<b>DGM Temperature (°F)</b>	116	116	115	
<b>Ambient Temperature (°F)</b>	87	87	86	
<b>Elapsed Time (min.)</b>	10.0	10.0	10.0	
<b>Setting (l/min)</b>	0.5	0.5	0.5	
<b>Barometric Pressure (inches Hg)</b>	29.50	29.50	29.50	
<b>Pump Vacuum (inches Hg)</b>	18.0	18.0	18.0	
<b>K'</b>	0.012	0.012	0.012	
<b>Vcr (l<sup>3</sup>)</b>	4.285	4.285	4.289	
<b>Vmstd (l<sup>3</sup>)</b>	4.424	4.422	4.389	
<b>Post Test Yc</b>	0.96853	0.96912	0.97712	
<b>Full Test Yd</b>	0.9985	0.9985	0.9985	
<b>% Difference</b>	3.00	2.94	2.14	
	<b>Average Difference</b>		<b>2.69</b>	

## Airtech Environmental Services, Inc. S-Type Pitot Tube Inspection Form

Date 1/25/11  
 Pitot ID AE5-6-2  
 Operator EA

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.356	NA
Base To Opening Distance - Pb (inches)	0.356	NA
Pa/Dt	1.42	1.05-1.50
Pb/Dt	1.42	1.05-1.50
Angle $\alpha 1$ ( $^{\circ}$ )	2.7	10
Angle $\alpha 2$ ( $^{\circ}$ )	2.6	10
Angle B1 ( $^{\circ}$ )	4	5
Angle B1 ( $^{\circ}$ )	0.6	5
Opening to Opening Distance Pa+Pb (inches)	0.712	NA
Angle Z ( $^{\circ}$ )	0.4	NA
z (inches)	0.0050	0.125
Angle W ( $^{\circ}$ )	0	NA
w (inches)	0.000	0.031

Note Any Damage, Nicks or Dents to the Pitot Tube.

Is the Pitot Tube Part of an Assembly Yes  
 If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	0.75	0.75 in.
Pitot to Thermocouple Distance (inches)	2	2 in.
Pitot to Sample Probe Distance (inches)	6.25	3 in.

Does the Pitot Tube Meet the Above Requirements Yes  
 Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned  
 If No to Either, then the Pitot Tube Must be Calibrated



**Airtech Environmental Services, Inc.**  
**S-Type Pitot Tube Inspection Form**

Date 1/25/11  
Pitot ID AE-5-6-3  
Operator EA

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.362	NA
Base To Opening Distance - Pb (Inches)	0.362	NA
Pa/Dt	1.45	1.05-1.50
Pb/Dt	1.45	1.05-1.50
Angle $\alpha 1$ (°)	3.4	10
Angle $\alpha 2$ (°)	2	10
Angle B1 (°)	1.3	5
Angle B1 (°)	2.1	5
Opening to Opening Distance Pa+Pb (inches)	0.724	NA
Angle Z (°)	0	NA
z (inches)	0.0000	0.125
Angle W (°)	0.9	NA
w (inches)	0.011	0.031

**Note Any Damage, Nicks or Dents to the Pitot Tube**

Is the Pitot Tube Part of an Assembly Yes  
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	0.75	0.75 in.
Pitot to Thermocouple Distance (inches)	2	2 in.
Pitot to Sample Probe Distance (inches)	4.25	3 in.

Does the Pitot Tube Meet the Above Requirements Yes  
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned  
If No to Either, then the Pitot Tube Must be Calibrated

**Airtech Environmental Services, Inc.**  
**S-Type Pitot Tube Inspection Form**

Date 1/25/11  
Pitot ID AE-5-6-4WC  
Operator EA

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.329	NA
Base To Opening Distance - Pb (inches)	0.329	NA
Pa/Dt	1.32	1.05-1.50
Pb/Dt	1.32	1.05-1.50
Angle $\alpha_1$ (°)	2.3	10
Angle $\alpha_2$ (°)	1.7	10
Angle B1 (°)	3.9	5
Angle B1 (°)	3.5	5
Opening to Opening Distance Pa+Pb (inches)	0.658	NA
Angle Z (°)	2.5	NA
z (inches)	0.0287	0.125
Angle W (°)	0.3	NA
w (inches)	0.003	0.031

**Note Any Damage, Nicks or Dents to the Pitot Tube**

Is the Pitot Tube Part of an Assembly Yes  
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	0.75	0.75 in.
Pitot to Thermocouple Distance (inches)	2	2 in.
Pitot to Sample Probe Distance (inches)	5	3 in.

Does the Pitot Tube Meet the Above Requirements Yes  
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned  
If No to Either, then the Pitot Tube Must be Calibrated

**Airtech Environmental Services, Inc.**  
**S-Type Pitot Tube Inspection Form**

Date 1/25/11  
Pitot ID AE5-6-5  
Operator EA

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.344	NA
Base To Opening Distance - Pb (inches)	0.344	NA
Pa/Dt	1.38	1.05-1.50
Pb/Dt	1.38	1.05-1.50
Angle $\alpha 1$ (°)	1.2	10
Angle $\alpha 2$ (°)	1.5	10
Angle B1 (°)	3.1	5
Angle B1 (°)	3.7	5
Opening to Opening Distance Pa+Pb (inches)	0.688	NA
Angle Z (°)	2.6	NA
z (inches)	0.0312	0.125
Angle W (°)	0.4	NA
w (inches)	0.005	0.031

Note Any Damage, Nicks or Dents to the Pitot Tube

Is the Pitot Tube Part of an Assembly Yes  
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	0.75	0.75 in.
Pitot to Thermocouple Distance (inches)	2.25	2 in.
Pitot to Sample Probe Distance (inches)	5.25	3 in.

Does the Pitot Tube Meet the Above Requirements Yes  
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned  
If No to Either, then the Pitot Tube Must be Calibrated

**Airtech Environmental Services, Inc.**  
**S-Type Pitot Tube Inspection Form**

Date January 26, 2011  
Pitot ID AE5-12-3  
Operator EA

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.338	NA
Base To Opening Distance - Pb (inches)	0.338	NA
Pa/Dt	1.35	1.05-1.50
Pb/Dt	1.35	1.05-1.50
Angle $\alpha 1$ ( $^{\circ}$ )	1.1	10
Angle $\alpha 2$ ( $^{\circ}$ )	1.1	10
Angle B1 ( $^{\circ}$ )	2.1	5
Angle B2 ( $^{\circ}$ )	3.5	5
Opening to Opening Distance Pa+Pb (inches)	0.676	NA
Angle Z ( $^{\circ}$ )	4.3	NA
z (inches)	0.05	0.125
Angle W ( $^{\circ}$ )	0.9	NA
w (inches)	0.01	0.031

**Note Any Damage, Nicks or Dents to the Pitot Tube**

Is the Pitot Tube Part of an Assembly Yes  
If Yes, Complete the Section Below

	Measured	Allowed
Distance From Nozzle, X (inches)	0.75	0.75 in.
Pitot to Thermocouple Distance, W (inches)	2.25	2 in.
Pitot to Sample Probe Distance, Y (inches)	3.500	3 in.

Does the Pitot Tube Meet the Above Requirements Yes  
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned  
If No to Either, then the Pitot Tube Must be Calibrated

### Sample Probe Calibration

Probe Type: 12FT M-5 PROBE I.D. Number: 7/8/11-3

#### Thermocouple Calibration

Reference Type \_\_\_\_\_ Reference I.D. No. \_\_\_\_\_ Pyrometer I.D. No: \_\_\_\_\_ Degrees: \_\_\_\_\_

Point No.	Target Temp.	Reference Temp.	Indicated Temp.	Temp. Difference	% Difference*	Specification
1	Ice-32F					%Difference ≤ 1.5
2	Ambient-70F					
3	Hot Oil-150F					
4	Boiling H <sub>2</sub> O-212					
5	Hot Oil-320F					

\* Based on Absolute Temperature (Rankine)

Does assembly meet specifications? \_\_\_\_\_

#### Geometric Pitot Calibration

"S" Pitot			Standard Pitot		
Measurement		Specification	Measurement (inches)		Specification
$\alpha 1(^{\circ})=1.000$	$\alpha 2(^{\circ})=0.000$	\$10^{\circ}	Tube O.D.	_____	(D)
$\beta 1(^{\circ})=1.000$	$\beta 2(^{\circ})=1.000$	\$05^{\circ}	Static Hole I.D.	_____	- 0.1 x (D)
$\gamma (^{\circ})=0.000$	$\theta (^{\circ})=0.000$	Pa + Pb = A	Length:		
Pa(^{\circ})=0.363	Pb(^{\circ})=0.363		Tip to Static	_____	± 6 x (D)
A(^{\circ})=0.725	Dt(^{\circ})=0.250		Static to Bend	_____	± 8 x (D)
<b>Calculations</b>					
Z(^{\circ})= A sin $\gamma$ =	0.0000	\$ 0.125"			
W(^{\circ})= A sin $\theta$ =	0.00000	\$ 0.03125"			

Does assembly meet specifications? \_\_\_\_\_

YES

→ If "Yes", "S" pitot Cp=0.84; Std. Pitot=0.99. If "No", wind tunnel calibration is required.

#### Wind Tunnel Calibration

Reference Pitot I.D. No: \_\_\_\_\_ Reference Pitot Cp: \_\_\_\_\_

Pitot Side 'A':				Deviation from Average Cp*	Specification
Trial No.	Reference P	Probe P	Probe Cp*		
1					Cp Deviations ≤ 0.01
2					
3					
Side 'A' Average Probe Cp=					

Pitot Side 'B':				Deviation from Average Cp*	Specification
Trial No.	Reference P	Probe P	Probe Cp*		
1					Cp Deviations ≤ 0.01
2					
3					
Side 'B' Average Probe Cp=					

\*Probe Cp= (Reference Cp)/(Reference P/ Probe P); Cp Deviation= Trial Cp - Average Probe Cp

'A' Average Cp	-	'B' Average Cp	=	Difference	
					Difference  ≤ 0.01

Does assembly meet specifications? \_\_\_\_\_

→ If "Yes", Cp= Average of Side 'A' and 'B' Cp values. If "No", Pitot must be replaced.

All specifications are from EPA-600/9-76-005, section 3.1

Probe Cp= 0.84 Calibrated by: Dscreen Date: 7/8/2011

