

Annex D1

# Calibration Certificates for Dust Monitoring Equipment

## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID : AM1	Date of Calibration: 24-Mar-22
Name and Model: TISCH HVS Model TE-5170	Next Calibration Date: 24-May-22
	Operator: Wesley Yiu

### CONDITIONS

Sea Level Pressure (hPa)	1014.3	Corrected Pressure (mm Hg)	760.725
Temperature (°C)	17.6	Temperature (K)	291

### CALIBRATION ORIFICE

Make-> TISCH		Qstd Slope ->	1.99838
Model-> 5025A		Qstd Intercept ->	-0.00903
Serial # -> 1612			

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.80	5.80	11.6	1.731	58	59.51	Slope = 39.3025 Intercept = -6.8558 Corr. coeff. = 0.9948
13	4.60	4.60	9.2	1.542	54	55.40	
10	3.60	3.60	7.2	1.365	46	47.19	
7	2.20	2.20	4.4	1.068	35	35.91	
5	1.50	1.50	3.0	0.883	26	26.67	

**Calculations :**

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))]-b$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

**For subsequent calculation of sampler flow:**

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

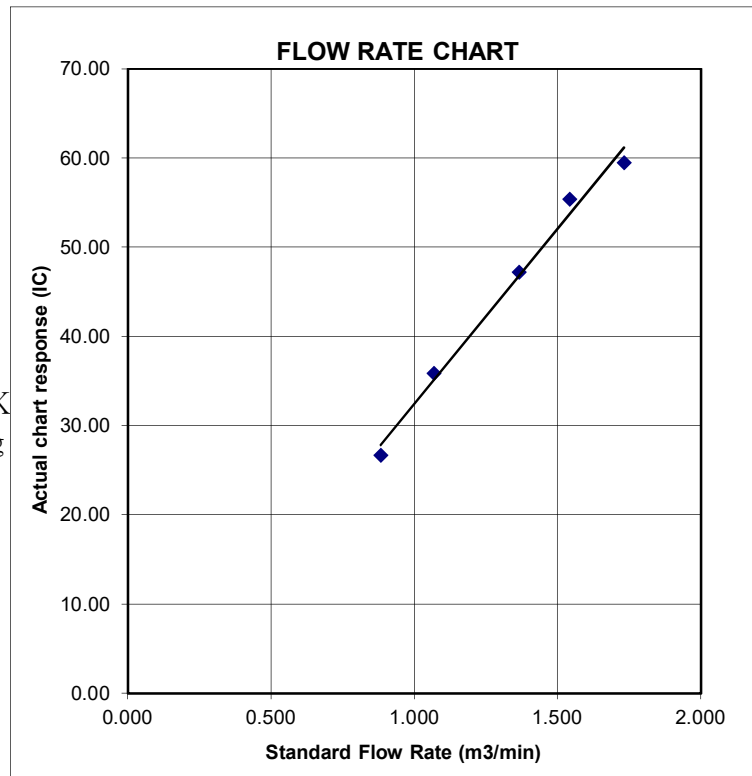
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID : AM2	Date of Calibration: 24-Mar-22
Name and Model: TISCH HVS Model TE-5170	Next Calibration Date: 24-May-22
	Operator: Wesley Yiu

### CONDITIONS

Sea Level Pressure (hPa) <span style="float: right;">1014.3</span>	Corrected Pressure (mm Hg) <span style="float: right;">760.725</span>
Temperature (°C) <span style="float: right;">17.6</span>	Temperature (K) <span style="float: right;">291</span>

### CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 1.99838
Model-> 5025A	Qstd Intercept -> -0.00903
Serial # -> 1612	

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.50	6.50	13.0	1.832	52	53.35	Slope = 31.1509 Intercept = -3.0018 Corr. coeff. = 0.9961
13	5.20	5.20	10.4	1.639	48	49.25	
10	4.00	4.00	8.0	1.438	40	41.04	
7	2.40	2.40	4.8	1.115	32	32.83	
5	1.60	1.60	3.2	0.911	24	24.62	

**Calculations :**

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K)

Pstd = actual pressure during calibration ( mm Hg)

**For subsequent calculation of sampler flow:**

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

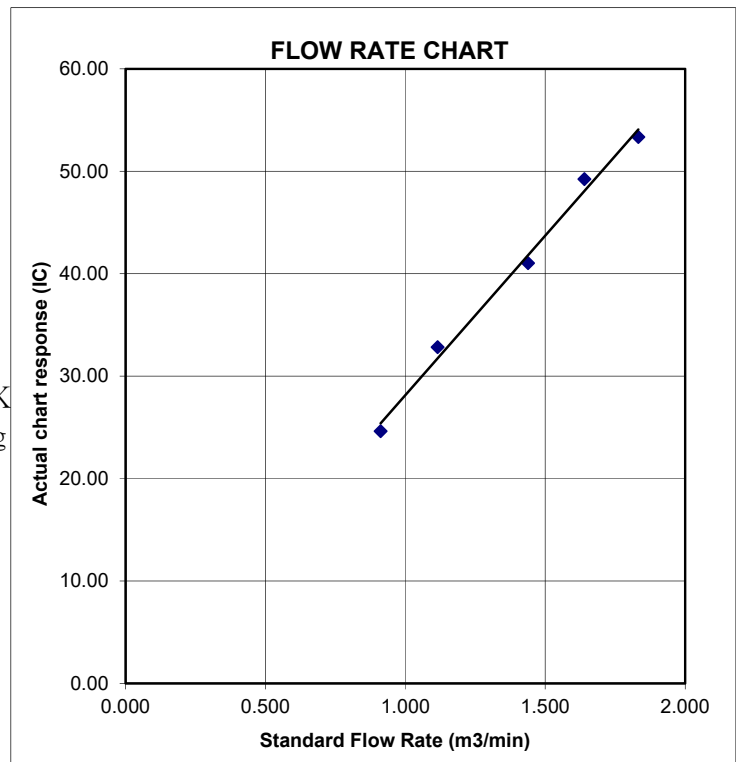
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID : AM3	Date of Calibration: 24-Mar-22
Name and Model: TISCH HVS Model TE-5170	Next Calibration Date: 24-May-22
	Operator: Wesley Yiu

### CONDITIONS

Sea Level Pressure (hPa) <span style="border: 1px solid black; padding: 2px;">1014.3</span>	Corrected Pressure (mm Hg) <span style="border: 1px solid black; padding: 2px;">760.725</span>
Temperature (°C) <span style="border: 1px solid black; padding: 2px;">17.6</span>	Temperature (K) <span style="border: 1px solid black; padding: 2px;">291</span>

### CALIBRATION ORIFICE

Make-> <span style="border: 1px solid black; padding: 2px;">TISCH</span>	Qstd Slope -> <span style="border: 1px solid black; padding: 2px;">1.99838</span>
Model-> <span style="border: 1px solid black; padding: 2px;">5025A</span>	Qstd Intercept -> <span style="border: 1px solid black; padding: 2px;">-0.00903</span>
Serial # -> <span style="border: 1px solid black; padding: 2px;">1612</span>	

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.775	58	59.51	Slope = 35.9836 Intercept = -4.0881 Corr. coeff. = 0.9992
13	4.80	4.80	9.6	1.575	52	53.35	
10	3.70	3.70	7.4	1.384	44	45.14	
7	2.50	2.50	5.0	1.138	36	36.93	
5	1.50	1.50	3.0	0.883	27	27.70	

**Calculations :**

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

**For subsequent calculation of sampler flow:**

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

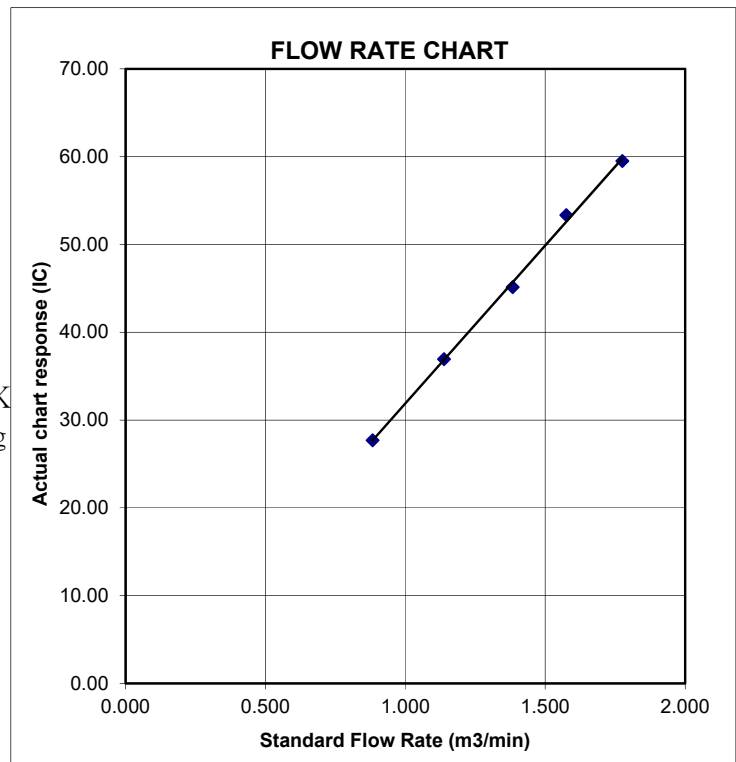
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



## TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location ID : AM4	Date of Calibration: 24-Mar-22
Name and Model: TISCH HVS Model TE-5170	Next Calibration Date: 24-May-22
	Operator: Wesley Yiu

### CONDITIONS

Sea Level Pressure (hPa) <span style="float: right;">1014.3</span>	Corrected Pressure (mm Hg) <span style="float: right;">760.725</span>
Temperature (°C) <span style="float: right;">17.6</span>	Temperature (K) <span style="float: right;">291</span>

### CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 1.99838
Model-> 5025A	Qstd Intercept -> -0.00903
Serial # -> 1612	

### CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.775	56	57.45	Slope = 31.6006 Intercept = 1.2031 Corr. coeff. = 0.9990
13	4.90	4.90	9.8	1.592	50	51.30	
10	3.80	3.80	7.6	1.402	44	45.14	
7	2.50	2.50	5.0	1.138	37	37.96	
5	1.50	1.50	3.0	0.883	28	28.73	

**Calculations :**

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K

Pstd = actual pressure during calibration ( mm Hg

**For subsequent calculation of sampler flow:**

$$1/m(( I )[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

