TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Siu Ho Wan WTW Administration
Location ID : SHWAB
Name and Model: TISCH HVS Model TE-5170

Date of Calibration: 24-Apr-26
Next Calibration Date: 24-Jun-26
Technician: Dicky Chan

CONDITIONS

Sea Level Pressure (hPa)	1012.8	Corrected Pressure (mm Hg)	759.6
Temperature (°C)	21.1	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.09671
Model->	5025A	Qstd Intercept ->	-0.01852
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.685	53	53.69	Slope = 28.8347
13	4.80	4.80	9.6	1.496	48	48.62	Intercept = 4.9965
10	3.60	3.60	7.2	1.297	41	41.53	Corr. coeff. = 0.9984
7	2.40	2.40	4.8	1.060	35	35.45	
5	1.60	1.60	3.2	0.867	30	30.39	

Calculations :

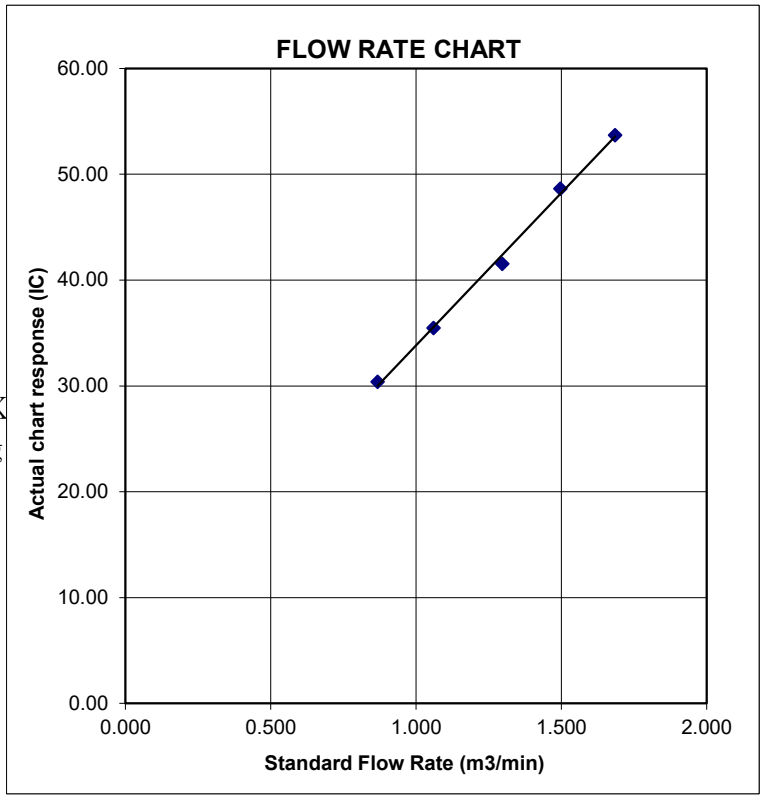
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

m = sampler slope
b = sampler intercept
I = chart response
Tav = daily average temperature
Pav = daily average pressure



TISCH Environmental

RECALIBRATION DUE DATE:
December 8, 2026

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	December 8, 2025	**Rootsmeter S/N:** 438320	**Ta:** 294	°K
Operator:	Jim Tisch		**Pa:** 755.7	mm Hg
Calibration Model #:	TE-5025A	**Calibrator S/N:** **1941**		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4570	3.2	2.00
2	3	4	1	1.0380	6.4	4.00
3	5	6	1	0.9290	7.9	5.00
4	7	8	1	0.8850	8.8	5.50
5	9	10	1	0.7320	12.8	8.00

Data Tabulation

Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (y-axis)
1.0035	0.6888	1.4197	0.9958	0.6834	0.8821
0.9993	0.9627	2.0078	0.9915	0.9552	1.2475
0.9973	1.0735	2.2448	0.9895	1.0652	1.3948
0.9961	1.1255	2.3543	0.9884	1.1168	1.4628
0.9907	1.3535	2.8394	0.9831	1.3430	1.7642
QSTD	**m=**	**2.13603**	**QA**	**m=**	**1.33754**
	b=	**-0.04992**		**b=**	**-0.03102**
	r=	**1.00000**		**r=**	**1.00000**

Calculations

Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	**Qa=**	Va/ΔTime

For subsequent flow rate calculations:

Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$

Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg

Key
ΔH: calibrator manometer reading (in H2O)
ΔP: rootsmeter manometer reading (mm Hg)
Ta: actual absolute temperature (°K)
Pa: actual barometric pressure (mm Hg)
b: intercept
m: slope

RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.
145 South Miami Avenue
Village of Cleves, OH 45002

www.tisch-env.com
TOLL FREE: (877)263-7610
FAX: (513)467-9009