



Gillware, Inc.
1802 Wright Street
Madison, WI 53704

Test Reports
August, 2020

6579 N. Sidney Place - P.O. Box 090527
Milwaukee, WI 53209
Phone: (414) 228-1213 Fax: (414) 228-9626



Gillware, Inc.

1802 Wright Street
Madison, WI 53704

Laminar s/n: 9811024 - Hood #1

Purpose: To determine if the cleanzone meets ISO Class 5 in the "at rest" mode in accordance with ISO 14644.1:2015

Procedure: A zone classification of ISO Class 5 is desired in this area. The air being supplied to this area is of a non-unidirectional pattern. The minimum number of sample locations required for classification was determined by the area and Table A.1.

$$A = \frac{6.000}{10.76} \text{ ft}^2 = 0.558 \text{ m}^2$$

Table A.1: 1 Location(s)

No fewer than one location shall be sampled and at least three samples shall be taken for any cleanzone. Sample locations shall be uniformly spaced except as limited by equipment within the cleanzone. Sample volume will be taken at a minimum of two liters and a minimum sample time of one minute.

Statistical Analysis: 0.5 μ particle size/m³

Average Particle Concentrations:

Location #: 1) 18
2) 0

Mean of the Averages: 9

Standard Deviation: 18

Compliance Determination: Since the average particle concentration at each location is less than 3,520 particles per m³, the air sample is verified as complying with airborne cleanliness ISO Class 5 at 0.5 μ in accordance with ISO 14644.1:2015

Testing Technician(s): Erik Thompson Date: 8/12/2020

Particle Counter: TSI Model #: 9310-02 Serial #: 93101653005 Cal. Due: 1/23/2021

Gillware, Inc.
1802 Wright Street
Madison, WI 53704

Laminar s/n: 9811024 - Hood #1
Particle Counts

Instrument Model: TSI 9310-02
Instrument Serial #: 93101653005
Particle Data: Cumulative

Timestamp	Location (Name)	0.5 micron (p/m ³)	Sample Volume (ft ³)
8/12/2020 09:20:27	1	35.0	1.001
8/12/2020 09:21:27	1	0.0	1.001
8/12/2020 09:22:47	2	0.0	1.001
8/12/2020 09:23:47	2	0.0	1.001
Average		8.8	1.001
Maximum		35.0	1.001
Minimum		0.0	1.001
Standard Deviation		17.5	0.000



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1802 Wright Street
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Laminar s/n: 204670538 - Hood #2

Purpose: To determine if the cleanzone meets ISO Class 5 in the "at rest" mode in accordance with ISO 14644.1:2015

Procedure: A zone classification of ISO Class 5 is desired in this area. The air being supplied to this area is of a non-unidirectional pattern. The minimum number of sample locations required for classification was determined by the area and Table A.1.

$$A = \frac{6.000}{10.76} \text{ ft}^2 = 0.558 \text{ m}^2$$

Table A.1: 1 Location(s)

No fewer than one location shall be sampled and at least three samples shall be taken for any cleanzone. Sample locations shall be uniformly spaced except as limited by equipment within the cleanzone. Sample volume will be taken at a minimum of two liters and a minimum sample time of one minute.

Statistical Analysis: 0.5µ particle size/m³

Average Particle Concentrations:

Location #: 1) 0
2) 71

Mean of the Averages: 35

Standard Deviation: 71

Compliance Determination: Since the average particle concentration at each location is less than 3,520 particles per m³, the air sample is verified as complying with airborne cleanliness ISO Class 5 at 0.5µ in accordance with ISO 14644.1:2015

Testing Technician(s): Erik Thompson Date: 8/12/2020

Particle Counter: TSI Model #: 9310-02 Serial #: 93101653005 Cal. Due: 1/23/2021

Gillware, Inc.
1802 Wright Street
Madison, WI 53704

Laminar s/n: 204670538 - Hood #2
Particle Counts

Instrument Model: TSI 9310-02
Instrument Serial #: 93101653005
Particle Data: Cumulative

Timestamp	Location (Name)	0.5 micron (p/m ³)	Sample Volume (ft ³)
8/12/2020 09:15:31	1	0.0	1.001
8/12/2020 09:16:31	1	0.0	1.001
8/12/2020 09:17:49	2	141.0	1.001
8/12/2020 09:18:49	2	0.0	1.001
Average		35.3	1.001
Maximum		141.0	1.001
Minimum		0.0	1.001
Standard Deviation		70.5	0.000



Gillware, Inc.

1802 Wright Street
Madison, WI 53704

Laminar - Hood #3

Purpose: To determine if the cleanzone meets ISO Class 5 in the "at rest" mode in accordance with ISO 14644.1:2015

Procedure: A zone classification of ISO Class 5 is desired in this area. The air being supplied to this area is of a non-unidirectional pattern. The minimum number of sample locations required for classification was determined by the area and Table A.1.

$$A = \frac{22.430}{10.76} \text{ ft}^2 = 2.085 \text{ m}^2$$

Table A.1: 2 Location(s)

No fewer than one location shall be sampled and at least three samples shall be taken for any cleanzone. Sample locations shall be uniformly spaced except as limited by equipment within the cleanzone. Sample volume will be taken at a minimum of two liters and a minimum sample time of one minute.

Statistical Analysis: 0.5 μ particle size/m³

Average Particle Concentrations:

Location #: 1) 0
2) 0

Mean of the Averages: 0

Standard Deviation: 0

Compliance Determination: Since the average particle concentration at each location is less than 3,520 particles per m³, the air sample is verified as complying with airborne cleanliness ISO Class 5 at 0.5 μ in accordance with ISO 14644.1:2015

Testing Technician(s): Erik Thompson Date: 8/12/2020

Particle Counter: TSI Model #: 9310-02 Serial #: 93101653005 Cal. Due: 1/23/2021

Gillware, Inc.
1802 Wright Street
Madison, WI 53704

Laminar - Hood #3
Particle Counts

Instrument Model: TSI 9310-02
Instrument Serial #: 93101653005
Particle Data: Cumulative

Timestamp	Location (Name)	0.5 micron (p/m ³)	Sample Volume (ft ³)
8/12/2020 09:25:12	1	0.0	1.001
8/12/2020 09:26:12	1	0.0	1.001
8/12/2020 09:30:25	2	0.0	1.001
8/12/2020 09:31:25	2	0.0	1.001
Average		0.0	1.001
Maximum		0.0	1.001
Minimum		0.0	1.001
Standard Deviation		0.0	0.000



CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

ENVIRONMENT CONDITION		
TEMPERATURE	75.7 (24.3)	°F (°C)
RELATIVE HUMIDITY	28	%RH
BAROMETRIC PRESSURE	28.95 (980.4)	inHg (hPa)

MODEL	9310-02
SERIAL NUMBER	93101653005
CUSTOMER INST ID	

<input checked="" type="checkbox"/> AS LEFT	<input checked="" type="checkbox"/> IN TOLERANCE
<input type="checkbox"/> AS FOUND	<input type="checkbox"/> OUT OF TOLERANCE

AEROTrak CALIBRATION KIT			
MEASUREMENT VARIABLE	SYSTEM ID	DATE LAST CALIBRATED	CALIBRATION DUE DATE
FLOW METER	E003739	11/11/2019	5/31/2020
7201-02F	E005520	10/17/2019	04/30/2020
FLOW METER	E005634	8/20/2019	8/31/2020

PARTICLE STANDARDS				
PARTICLE SIZE	STANDARD UNCERTAINTY	STANDARD DEVIATION	LOT NO.	EXPIRATION DATE
0.303 µm	0.003 µm	0.0047 µm	196947	4/30/2021
0.510 µm	0.0035 µm	0.0092 µm	210349	4/30/2022
0.994 µm	0.0075 µm	0.010 µm	211354	4/30/2022
2.92 µm	0.015 µm	0.03 µm	181443	2/28/2020
5.020 µm	0.02 µm	0.07 µm	220284	12/31/2022
9.850 µm	0.03 µm	0.13 µm	206793	1/31/2022

TSI does hereby certify that the calibration performed on the above described instrument meets the requirements of ISO 21501-4. TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI is registered to ISO-9001:2008.

Charles Traore
CALIBRATED

January 23, 2020
DATE



CERTIFICATE OF CALIBRATION

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 <http://www.tsi.com>

SIZE CALIBRATION AND VERIFICATION OF SIZE SETTING

NOMINAL PARTICLE SIZE	GAIN STAGE	DIGITAL CUTPOINT	EXPANDED UNCERTAINTY
0.3 μm	A	130	4.1%
0.5 μm	A	800	3.8%
1 μm	A	2100	3.9%
3 μm	B	1055	3.7%
5 μm	B	2500	3.6%
10 μm	B	9000	3.6%

COUNTING EFFICIENCY

PARTICLE SIZE	ACTUAL	ALLOWABLE RANGE	PASS/FAIL
0.3 μm	48%	50% \pm 20%	Pass
0.5 μm	97%	100% \pm 10%	Pass

SIZE RESOLUTION

PARTICLE SIZE	MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.5 μm	5.4%	\leq 15%	Pass

FALSE COUNT RATE

SAMPLE TIME (MIN)	SAMPLED (L)	MEASURED COUNTS (#)	CONCENTRATION ($\#/M^3$)	95% UCL ($\#/M^3$)	ALLOWABLE RANGE ($\#/M^3$)	PASS/FAIL
30	849	0	0.00	3.5	\leq 7.1	Pass

SAMPLING FLOW RATE (L/MIN)

NOMINAL	ACTUAL	ERROR	ALLOWABLE RANGE	PASS/FAIL
28.3	28.3	0.0 %	\pm 5%	Pass

SAMPLING TIME †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
$< \pm 0.1\%$	$\pm 1\%$	Pass

RESPONSE RATE †

MEASURED	ALLOWABLE RANGE	PASS/FAIL
0.0006%	$\leq 0.5\%$	Pass

MAXIMUM PARTICLE CONCENTRATION †

29000000 $\#/m^3$ @10% Coincidence Loss

† Tested and verified during product development

CALIBRATION INTERVAL

CALIBRATION DATE	EXPIRATION DATE
January 23, 2020	January 23, 2021

Certificate of Accreditation

THIS IS TO CERTIFY THAT

Mr. Erik J. Thompson

Class 1 Air, Inc.

6579 North Sidney Place, P.O. Box 090527

Milwaukee, WI 53209

HAS MET THE REQUIREMENTS OF THE
NSF BIOSAFETY CABINET FIELD CERTIFIER
ENHANCED ACCREDITATION PROGRAM AND
HAS BEEN GRANTED FULL ACCREDITATION.



A handwritten signature in black ink, appearing to read "Tina Yerkes".

Certificate Number: C0077623 - 02
Initial Accreditation Date: August 9, 2011
Expiration Date: August 9, 2021

Tina Yerkes
General Manager, Water Systems