

**ADHESIVES RESEARCH
B1 CONVERTING SUITE
GLEN ROCK, PA**

**CLEANROOM CERTIFICATION
REPORT**

JUNE 26th, 2020

ATS REPORT#: 2006-3991

CLEANROOM INVESTIGATION

ADHESIVES RESEARCH INC GLEN ROCK, PA

2020 RESULTS

TEST RESULTS AND RECOMMENDATIONS

INTRODUCTION:

On June 26, 2020, ATS performed certification testing for (1) Airlock and (1) Cleanroom located at the Adhesives Research facility in Glen Rock, PA. All testing was performed in accordance with IEST-RP-CC-006.3 and ISO-14644 specifications.

RESULTS SUMMARY:

All rooms passed certification testing in accordance with the above-mentioned specifications.

RECOMMENDATIONS:

ATS recommends no further action at this time.

APPROVAL:

Prepared by:  Date: 27 JUN 2020

Approved by:  Date: 27 JUN 2020

ADHESIVES RESEARCH
GLEN ROCK, PA



AIRFLOW AND ACPH

2020 RESULTS

ROOM/ ISO CLASS	ROOM VOLUME CUFT	FILTER NO.	FILTER VOLUME CUFT	CALCULATED ACPH	MINIMUM REQUIRED ACPH	MEETS CRITERIA
CLEANROOM ISO 8	21,827	1	606	40	30	YES
		2	666			
		3	662			
		4	636			
		5	603			
		6	655			
		7	714			
		8	518			
		9	629			
		10	624			
		11	665			
		12	638			
		13	645			
		14	599			
		15	622			
		16	508			
		17	640			
		18	627			
		19	588			
		20	508			
		21	624			
		22	620			
		23	628			
		24	472			
AIRLOCK ISO 8	1,000	1	645	39	30	YES

Area Class: ISO Class 8
 Test Equipment: ADM-860, ADM-860C S/Ns: M04106
 All testing performed iaw ISO 14644 and IEST RP-CC006.3
 Date Completed: 26 JUN 2020
 Retest Date: JUNE 2021
 Technicians: J JOHNSON

**ADHESIVES RESEARCH
GLEN ROCK, PA**

**HEPA FILTER INTEGRITY
2020 RESULTS**

ROOM NO.	FILTER NO.	FILTER LEAK TEST <0.01%	MEETS CRITERIA	TYPE OF LEAK	SUCCESSFUL REPAIR / AREA %	FILTER REPLACED	NEW FILTER SN
CLEANROOM	1	0.00%	YES	NA	NA	NA	NA
	2	0.00%	YES	NA	NA	NA	NA
	3	0.00%	YES	NA	NA	NA	NA
	4	0.00%	YES	NA	NA	NA	NA
	5	0.00%	YES	NA	NA	NA	NA
	6	0.00%	YES	NA	NA	NA	NA
	7	0.00%	YES	NA	NA	NA	NA
	8	0.00%	YES	NA	NA	NA	NA
	9	0.00%	YES	NA	NA	NA	NA
	10	0.00%	YES	NA	NA	NA	NA
	11	0.00%	YES	NA	NA	NA	NA
	12	0.00%	YES	NA	NA	NA	NA
	13	0.00%	YES	NA	NA	NA	NA
	14	0.00%	YES	NA	NA	NA	NA
	15	0.00%	YES	NA	NA	NA	NA
	16	0.00%	YES	NA	NA	NA	NA
	17	0.00%	YES	NA	NA	NA	NA
	18	0.00%	YES	NA	NA	NA	NA
	19	0.00%	YES	NA	NA	NA	NA
	20	0.00%	YES	NA	NA	NA	NA
	21	0.00%	YES	NA	NA	NA	NA
	22	0.00%	YES	NA	NA	NA	NA
	23	0.00%	YES	NA	NA	NA	NA
	24	0.00%	YES	NA	NA	NA	NA
AIRLOCK	1	0.00%	YES	NA	NA	NA	NA

Area Class: ISO Class 8
 Test Condition: At Rest
 Test Equipment: PH-5, 2H S/Ns: 3237
 All testing performed iaw ISO 14644 and IEST RP-CC006.3
 Date Completed: 26 JUN 2020
 Retest Date: JUNE 2021
 Technicians: J JOHNSON

ADHESIVES RESEARCH
GLEN ROCK, PA



ROOM DIFFERENTIAL PRESSURES

2020 RESULTS

FROM ROOM	TO ROOM	AS FOUND FLOW TOWARDS	DIFFERENTIAL PRESSURE IN WG	ACCEPTANCE RANGE IN WG	MEETS CRITERIA
CLEANROOM	AIRLOCK	AIRLOCK	0.0321	INFO ONLY	NA
AIRLOCK	WAREHOUSE	WAREHOUSE	0.0288	INFO ONLY	NA
CLEANROOM	GARB ROOM	GARB ROOM	0.0373	INFO ONLY	NA
CLEANROOM	OPENSOURCE	OPENSOURCE	0.0562	INFO ONLY	NA
CLEANROOM	WAREHOUSE	WAREHOUSE	0.0588	INFO ONLY	NA
CLEANROOM	WAREHOUSE	WAREHOUSE	0.0602	INFO ONLY	NA

Area Class: ISO Class 8
Test Equipment: ADM-860
All testing performed iaw ISO 14644 and IEST RP-CC006.3
Date Completed: 26 JUN 2020
Retest Date: JUN 2021
Technician: J JOHNSON

S/N: M04106

AIRBORNE PARTICLE COUNTS

2020 RESULTS

ROOM / ISO CLASS	PARTICLE SIZE	COUNTS (per 1 cubic foot)										AVERAGE	STD DEV	*ISO 14644-1 AVERAGE (cu m)	MEETS CRITERIA
CLEANROOM ISO 8	0.5 μ m	161	146	72	133	39	77	25	32	45	128	108	74	3,830	YES
		63	123	267	61	41	136	147	110	91	51				
		145	39	118	66	26	32	49	106	86	44				
		138	208	265	225	302									
	5.0 μ m	8	7	4	9	3	7	0	0	3	2	5	5	186	YES
		1	4	12	1	1	7	5	4	5	1				
		13	1	7	2	0	1	0	7	3	2				
		11	11	8	16	18									
AIRLOCK ISO 8	0.5 μ m	315	51	50	167	86	231					150	108	5,295	YES
	5.0 μ m	25	2	3	6	2	16					9	9	318	YES

* ISO 14644 = Ave In cu.ft. x 35.3 cu.ft. per cu.m = Avg.(cu.m.)

Area Class: ISO Class 8

Test Condition: At Rest

Test Equipment: HACH 3415, MET-1 2408

S/Ns: 990200240

ISO 14644-1 Class 8 - 3,520,000 Particles of 0.5um and greater

ISO 14644-1 Class 8 - 29,300 Particles of 5.0 um and greater

Date Completed: 26 JUN 2020

Retest Date: JUNE 2021

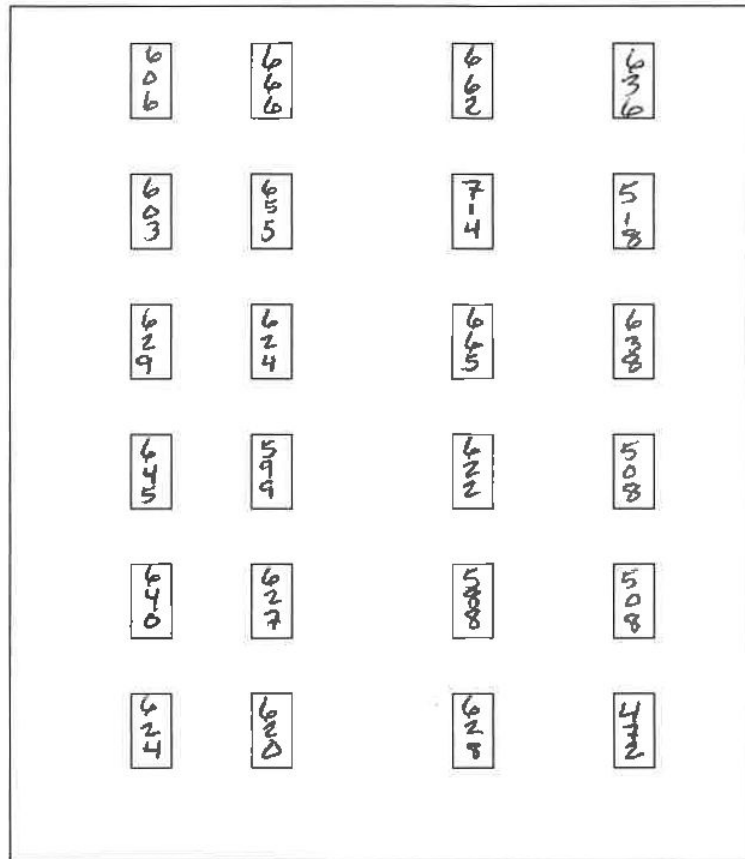
Technicians: J JOHNSON

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

HEPA FILTER SUPPLY FLOW
(Cubic Feet Per Minute)

Tested By: J. Johnson Date: 26 JUN 2020
Multimeter SN: MB4106 Calibration Due Date: 30 APR 2021



Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

☐ - HEPA filter

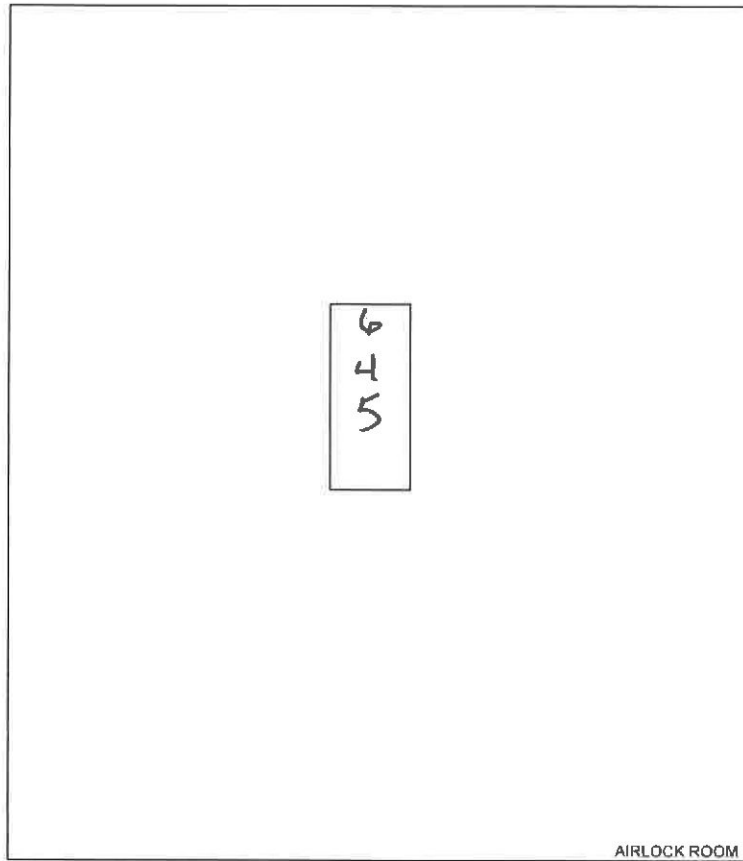
Comments: NONE

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

HEPA FILTER SUPPLY FLOW
(Cubic Feet Per Minute)

Tested By: J. Johnson Date: 26 JUN 2020
Multimeter SN: MO4106 Calibration Due Date: 30 APR 2021



Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

 - HEPA filter

Comments: _____

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

HEPA FILTER INTEGRITY
($<0.01\%$ leakage)

Tested By: J. Johnson Date: 26 JUN 2020
Photometer SN: 3237 Calibration Due Date: 31 DEC 2020

Z	Z	N/A ①	Z	Z
Z	Z	N/A ①	Z	Z
Z	Z	N/A ①	Z	Z
Z	Z	N/A ①	Z	Z
Z	Z	N/A ①	Z	Z
Z	Z	N/A ①	Z	Z

Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

 - HEPA filter

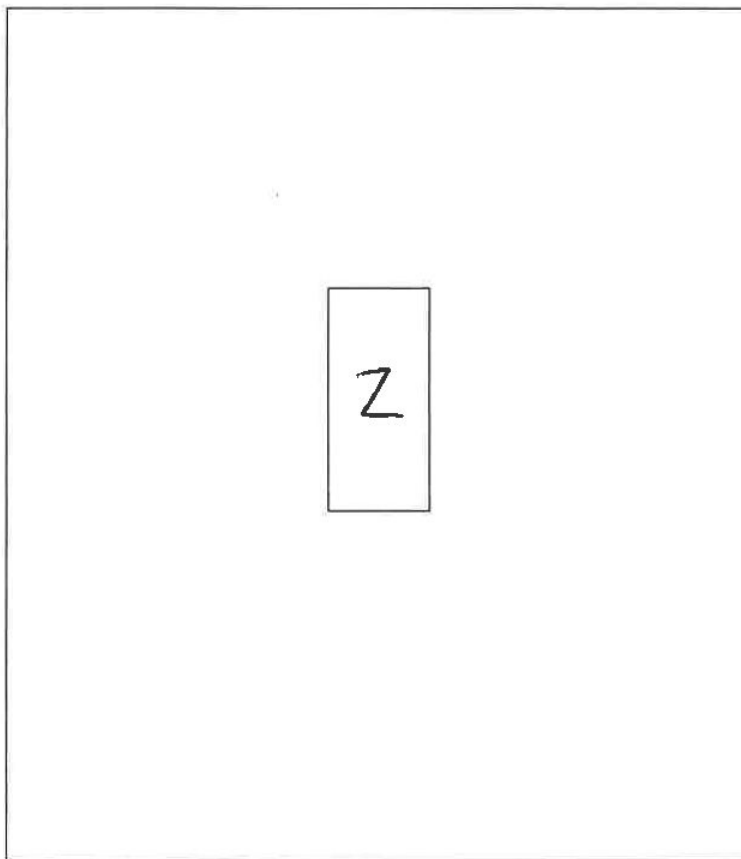
Comments: ① Form Error JJ 26 JUN 2020

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

HEPA FILTER INTEGRITY
($<0.01\%$ leakage)

Tested By: J. Johnson Date: 26 JUN 2020
Photometer SN: 3237 Calibration Due Date: 31 OCT 2020



Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

 - HEPA filter

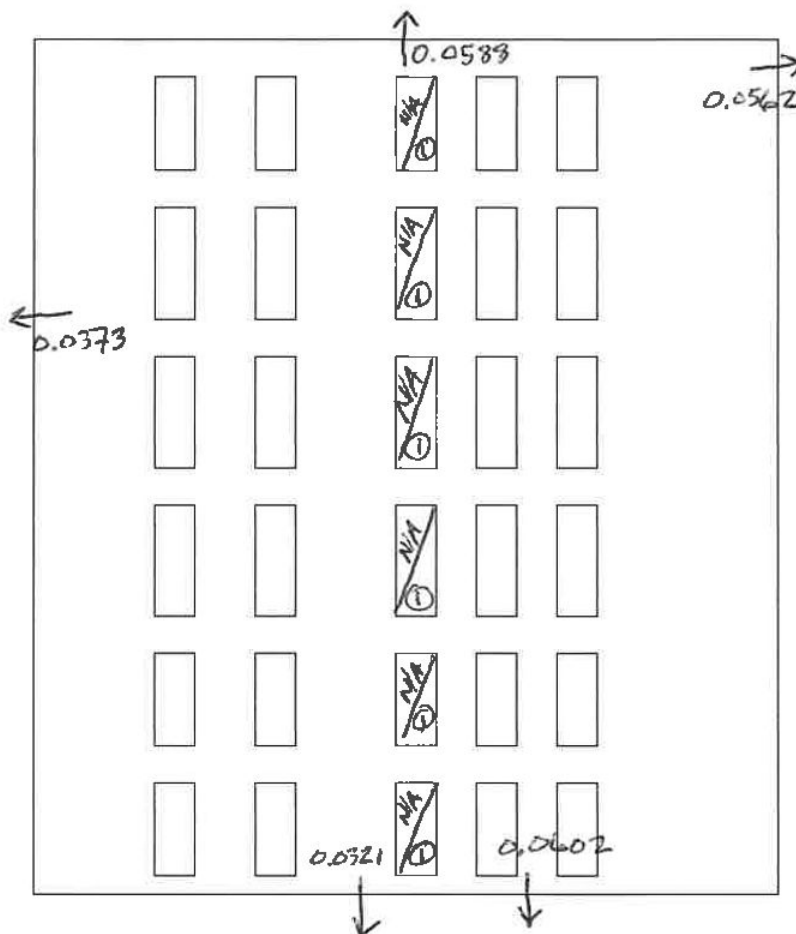
Comments: NONE

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

ROOM PRESURIZATION
(Inches water column)

Tested By: gjohn Date: 26 JUN 2020
Multimeter SN: M04106 Calibration Due Date: 30 APR 2021



Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

 - HEPA filter

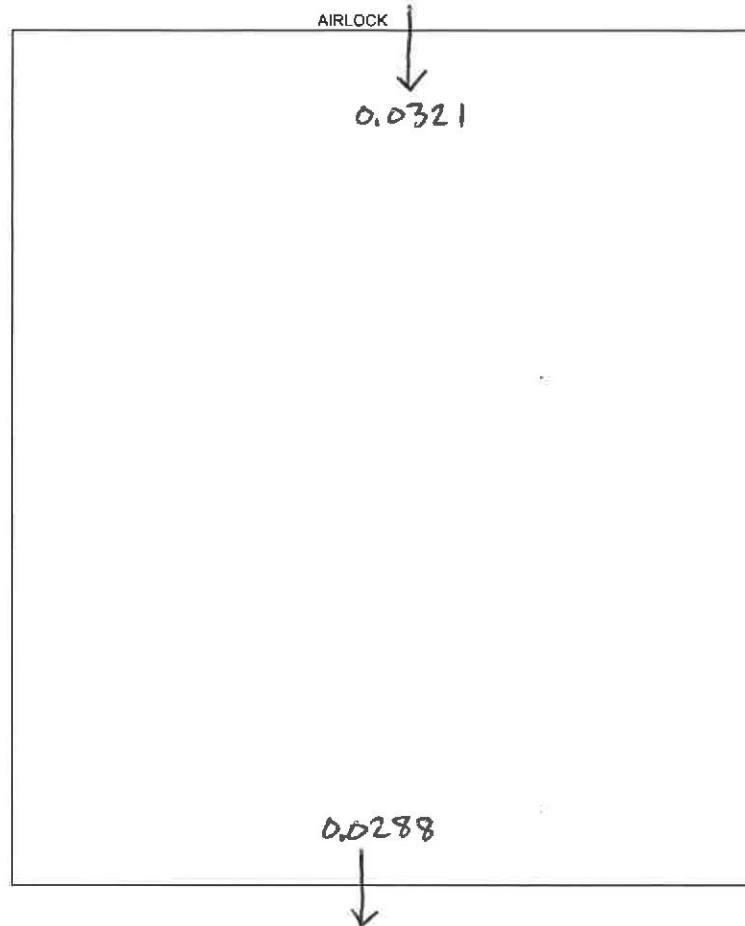
Comments: ① Form Error g/j 26 JUN 2020

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

ROOM PRESSURIZATION
(Inches Water Column)

Tested By: J. Johnson Date: 26 JUN 2020
Multimeter SN: 11 M04106 Calibration Due Date: 30 APR 2021



Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

☐ - HEPA filter

Comments: NONE

CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

AirBorne Particle Counts
(0.5 Micron and Larger)

Tested By: J. Johnson Date: 26 JUN 2020
Particle Count SN: 990200240 Calibration Due Date: 31 OCT 2020

G
A
R
B
R
O
O
M

161	146	72	133	39
77	25	32	45	128
63	123	267	61	41
136	147	110	91	51
145	39	118	66	26
32	49	106	86	44
138	208	265	225	362

AIR LOCK

Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

☐ - HEPA filter

Comments: NONE

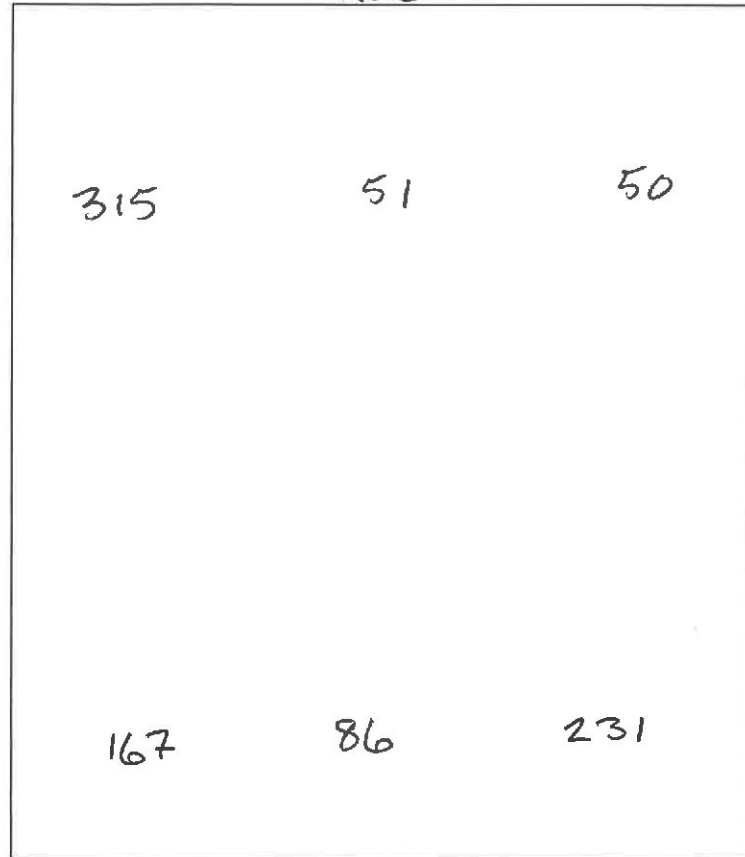
CLEANROOM TEST DATA
ADHESIVES RESEARCH
Glen Rock, PA

REPORT NO. 2006

AirBorne Particle Counts
(0.5 Micron and Larger)

Tested By: J Johnson Date: 26 JUN 2020
Particle Count SN: 990200240 Calibration Due Date: 31 OCT 2020

AIRLOCK



WAREHOUSE

Z- Zero leakage
A- As found
R- As repaired (note size of repair)

*Not to Scale

☐ - HEPA filter

Comments: NONE



TEC Services, Inc.

25 Little Avenue
New Oxford, PA 17350
Phone: 717-624-3191
Fax: 717-624-3549
www.tecservicesinc.com

Controlled Environment Products
Calibration & Services

EQUIPMENT CALIBRATION REPORT

Date Received: 10/15/19 Date Shipped: 10/23/19
Customer: Atlantic Technical Systems Contact: Corine Higdon
Address: 415 Headquarters Dr., Ste. 2 Phone #: 443-223-3828
Millersville, MD 21108 Customer PO #: Verbal
Manufacturer: TEC Services Model #: PH-5
Instrument Type: Aerosol Photometer Serial #: 3237

INSTRUMENT DATA

		As Found	Final	Mfg. Tolerances
Straylight	(N/A)	N/A%	.691%	Not Applicable
Sample Flow	(1)	N/A	28.0	28.3 ± 2.8 SLPM
V1	(1)	N/A	5.15	5.15V ± .05V / -.00V
V2	(1)	N/A	12.06	12.0V ± 1V
V3	(1)	N/A	-12.04	-12.0V ± .5V
V4	(1)	N/A	24.00	24.0V ± .5V
U5	(1)	N/A	5.001	5.000 ± .010V
U12	(1)	N/A	5.003	5.000 ± .010V

(1) In Tolerance (2) Out of Tolerance (3) No effect on instrument operation (N/A) Not Applicable

Received in Tolerance: ☐ Yes ☐ No ☐ Not Operable

☒ Not Applicable - NEW INSTRUMENT

Calibrated for: ☒ PAO

Temperature: 21.1 °C

Relative Humidity: 39.0 %

MAINTENANCE PERFORMED

☐ Clean / Rebuild Chamber
☐ Check Wiring & Hardware

☐ Realign Optics
☐ Replace Gaskets

☐ Flush Hoses
☐ Update Software Version _____

☒ Not Applicable - NEW INSTRUMENT

Notes: _____

FINAL VERIFICATION PERFORMED

☒ Leak Test Sampling System
☒ Verify Max Gain Stability

☒ Test Scanning Probe
☒ Performance Test

☒ Perform Voltage Check

NIST TRACEABLE EQUIPMENT USED

Description	Model	Serial #	Certificate #	Cal Date	Due Date
Digital Multimeter	Fluke 87-V	46100043	1-Z6CE7-2-1	13 AUG 19	13 AUG 20
Thermohygrometer	Control Co. 90080-06	192359384	4040-10586428	24 JUL 19	24 JUL 20
Flowmeter	TSI 4043	40431911011	-	15 MAR 19	15 MAR 20

Calibrated per Procedure:

☒ TEC001 ☐ TEC002 ☒ TEC003 ☐ TEC004 ☒ TEC005
☐ TEC006 ☒ TEC007 ☒ TEC008 ☒ TEC009 ☐ TEC010

CALIBRATION BY: Det

DATE: 10/23/19 DUE DATE: 10/23/20



CERTIFICATE OF CALIBRATION

Beckman Coulter certifies that the calibration performed complies with the requirements of ISO 21501 in whole or in part, as requested by the customer. This certifies that the reported sizes in the calibration information section are accurate to +/- 10%.

The accuracy of the standards & equipment used for the calibration are traceable to the US National Institute of Standards and Technology (NIST). A record of all work performed is maintained by Beckman Coulter, an ISO 9001 accredited company. This certificate may not be reproduced other than in full. Calibration certificates without a watermark & an authorized signature are not valid.

General Information

Manufacturer/Lab

Beckman Coulter
5600 Lindbergh Drive
Loveland, CO 80539

Customer Name

ATS
415 Headquarters Dr.
Millersville, MD

John Griffin

Instrument Information

Counter Model A2408-1-115-1
Part Number 2082784-01
Counter Serial 990200240
Sensor Model AIR
Sensor Serial 27819
Procedure CO88149-1 REV E

Station ID Home
Calibration Date 2019-Oct-07
Calibration Due 2020-Oct-31

Temperature 23.1 °C
Relative Humidity 48.0 %
Nominal Flow 28.3 LPM
Laser Current N/A
(Reference Only)

Performance Information

Test Name	Test Result	Criteria	Pass/Fail
ISO-21501 Flow	28.3 LPM	±5%	Pass
Noise	14.4 mV	Reference Only	N/A
Peak to Valley	3.6:1	N/A	N/A
ISO-21501 Resolution (@5.027 µm)	0.99%	< 15%	Pass
ISO-21501 False Count Rate	0.0 particles in 0.42 m³	0.0 particles in 0.42 m³	Pass

Calibration Equipment

Type	Model	Serial	Cal Due Date
Stopwatch	TEKTRONIX	034302702	2019-Oct-31
Thermometer	Fluke 971	35460017	2020-Apr-30
Multimeter	Fluke	12750028	2020-Feb-29
PHA	CCPHA	1704418005	2020-Apr-30

Calibration Information

Channel	Size (µm)	Cal (mV)	Threshold (mV)	Particle Size (µm)	Mfg	Lot Number	Expiration Date
	N/A	18.31	18.31	0.303	Thermo	189903	2020-Oct-31
1	0.5	38.89	38.89	0.508	Thermo	193188	2021-Jan-31
	N/A	112.3	112.3	1.03	Duke	192847	2021-Jan-31
2	5.0	1461.19	1461.19	5.027	Duke	186584	2020-Jul-31

Standard Calibration
990200240.10.07.2019

Reproduction of this Certificate except in full is strictly forbidden without the written approval of Beckman Coulter

Calibrator : George Hutson



AS RECEIVED DATA

General Information

Manufacturer/Lab
Beckman Coulter
5600 Lindbergh Drive
Loveland, CO 80539

Customer Name

ATS
415 Headquarters Dr.
Millersville, MD

John Griffin

Instrument Information

Counter Model A2408-1-115-1
Part Number 2082784-01
Counter Serial 990200240
Sensor Model AIR
Sensor Serial 27819

Station ID Home
Calibration Date 2019-Oct-07
Calibration Due 2020-Oct-31
Procedure CO88149-1 REV E

Temperature 23.1 °C
Relative Humidity 48.0 %
Nominal Flow 28.3 LPM
Laser Current N/A

As Received Information

<u>Test Name</u>	<u>As Received</u>	<u>As Calibrated</u>	<u>Deviation (%)</u>	<u>Criteria (%)</u>	<u>Pass/Fail</u>
Flow	28.3	28.3	0	±10%	Pass
Noise	14.4	14.4	0	---	N/A
Zero Count	PASS	---	---	---	N/A

Channel Information

<u>Channel</u>	<u>Size</u>	<u>Calibrated (mV)</u>	<u>Pulse (mV)</u>	<u>As Received (mV)</u>	<u>As Received Size</u>	<u>Deviation(%)</u>	<u>Criteria(%)</u>	<u>Pass/Fail</u>
1	0.5	38.89	38.89	38.89	0.508	1.60	15.00	Pass
2	5.0	1461.19	1461.19	1461.19	5.027	0.54	15.00	Pass



Technical Safety Services
620 Hearst Ave.
Berkeley, CA 94710
(800) 877-7742



620 Hearst Ave.
Berkeley, CA 94710
tel: (510) 845-5591 fax: (510) 845-5595

Instrument Calibration Record

Cert.: ES20420101111 Facility: Technical Safety Services, LLC ID: 1232662 Cust. ID: EQ6699
SO: NC-NC201082A-1 Addr: 620 Hearst Avenue Make: Shortridge Instruments
Contact: Pete Mackes Berkeley, CA 94710 Model: ADM-870C
Phone: 5108455591 Bid: NC SN: M04106
Email: pmackes@techsafety.com Rm: cal lab Class: NA Type: Air Data Multimeter

Test Standard(s): TSS SOP 02.04.09.00

Environmental Conditions:		Temperature (C°): 21.8				Relative Humidity (%): 41		Service Loc.: TSS				
Condition of Instrument:		As Found Status:				Final Test Status:		Result:				
Good		Pass				Pass		Calibrated				
AS FOUND TEST DATA:							FINAL TEST DATA:					
TP	Cal. Unit	Standard	Instrument	Difference	Tol (±)	In Tol	Cal Unit	Standard	Instrument	Difference	Tol (±)	In Tol
1	"Hg	12.48	12.4	0.08	0.35	Yes	"Hg	12.48	12.4	0.08	0.35	Yes
2	"Hg	30.08	30.1	0.02	0.70	Yes	"Hg	30.08	30.1	0.02	0.70	Yes
3	"Hg	40.23	40.2	0.03	0.90	Yes	"Hg	40.23	40.2	0.03	0.90	Yes
4	"wc	0.04865	0.0503	0.00165	0.00197	Yes	"wc	0.04865	0.0503	0.00165	0.00197	Yes
5	"wc	0.12619	0.1270	0.00081	0.00352	Yes	"wc	0.12619	0.1270	0.00081	0.00352	Yes
6	"wc	0.22558	0.2233	0.00228	0.00551	Yes	"wc	0.22558	0.2233	0.00228	0.00551	Yes
7	"wc	0.27468	0.2724	0.00228	0.00649	Yes	"wc	0.27468	0.2724	0.00228	0.00649	Yes
8	"wc	2.0035	1.995	0.0085	0.0411	Yes	"wc	2.0035	1.995	0.0085	0.0411	Yes
9	"wc	3.6050	3.605	0.0000	0.0731	Yes	"wc	3.6050	3.605	0.0000	0.0731	Yes
10	"wc	4.4028	4.393	0.0098	0.0891	Yes	"wc	4.4028	4.393	0.0098	0.0891	Yes
11	"wc	27.012	26.95	0.062	0.541	Yes	"wc	27.012	26.95	0.062	0.541	Yes
12	"wc	48.610	48.47	0.140	0.973	Yes	"wc	48.610	48.47	0.140	0.973	Yes
13	fpm	100	100	0	10	Yes	fpm	100	100	0	10	Yes
14	fpm	501	501	0	22	Yes	fpm	501	501	0	22	Yes
15	(deg) F	35.6	35.6	0.0	0.2	Yes	(deg) F	35.6	35.6	0.0	0.2	Yes
16	(deg) F	95.0	94.9	0.1	0.2	Yes	(deg) F	95.0	94.9	0.1	0.2	Yes
17	(deg) F	154.4	154.6	0.2	0.2	Yes	(deg) F	154.4	154.6	0.2	0.2	Yes

Remarks: The results reported above relate only to the items calibrated.

The following NIST-Traceable equipment were used to perform this calibration:

Equipment ID	Manufacturer	Model	Last Cal. Date	Cal. Due Date	Accuracy
000209	TSI/TSI	8390/8495	01/07/2020	07/07/2020	na
001311	Heise	HQS-1 (gold)	08/20/2019	08/20/2020	0.0018"
001336	General Resistance In	RTD-1000/500	07/08/2019	07/08/2020	0.005% rdg
001715	Ashcroft	HQS-1 Gold	02/13/2020	02/13/2021	0.06%FS
001731	Heise	ST-2H	07/26/2019	07/26/2020	display only

Report Date: 18Apr2020

Retest Date: 18Apr2021

eData v6.6.3

Print Version: Service Manager v5.5.3

Print Date: 4/21/2020

Page: 1/2

Approved for Client Use

NC 205732
APR 21 2020

By [Signature] for TSS, LLC.

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Eric Sammon

20Apr2020 10:53 AM

Calibration Lab Supervisor

I certify that this record is a true and accurate representation of work performed.

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New York

web: www.techsafety.com