

EQUIPMENT PERFORMANCE REPORT

Ref: 20200722-R01



PROJECT

ATA DOPAIR MULTIZONE PERFORMANCE TEST

Date	PREPARED BY	
22 Jul 2020	Rayan ZAKHOUR	



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1. CONFIDENTIALITY

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2. SCOPE DEFINITION

2.1. Purpose

The purpose of this job is to evaluate the performance on the DOPAIR MULTIZONE AIR PURIFIER in a typical clean room. As per the requirements of PO 4412 from ATA.

This is done by comparing the particle contamination level in the room with and without the purifier in operations. Then a data comparison will be done to highlight the improvement on the air quality when the air purifier is in operation. See the unit serial number in photos below.



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2.2. Compliance

<p style="color: #4F81BD; margin: 0;">Local authorities</p> <p> <input type="checkbox"/> DHCC <input type="checkbox"/> DHA <input type="checkbox"/> DOH </p> <p><input type="checkbox"/> Others</p>	
<p style="color: #4F81BD; margin: 0;">Applicable norms and standards</p> <p> <input checked="" type="checkbox"/> Client requirements <input checked="" type="checkbox"/> ISO 14644 <input type="checkbox"/> USP 800 </p> <p> <input type="checkbox"/> ASHRAE STD 170 <input type="checkbox"/> CCFRA <input type="checkbox"/> USP 797 </p> <p> <input type="checkbox"/> GMP 2008 <input type="checkbox"/> USFDA <input type="checkbox"/> NIOSH </p>	
<p style="color: #4F81BD; margin: 0;">Qualifications phase</p> <p> <input type="checkbox"/> IQ (Installation) <input type="checkbox"/> OQ (Operational) <input type="checkbox"/> PQ (Performance) </p>	
<p style="color: #4F81BD; margin: 0;">Qualifications frequency</p> <p> <input type="checkbox"/> Monthly qualifications <input checked="" type="checkbox"/> Others : One time. </p> <p> <input type="checkbox"/> Quarterly qualifications <input type="checkbox"/> Annual Qualifications </p>	
<p style="color: #4F81BD; margin: 0;">External sourcing</p> <p> <input type="checkbox"/> Microbiological air sampling <input type="checkbox"/> Microbiological surface sampling <input type="checkbox"/> Microbiological incubation and analysis <input type="checkbox"/> Other </p>	<p style="color: #4F81BD; margin: 0;">Selected laboratory</p> <p> <input type="checkbox"/> WIMPEY <input type="checkbox"/> Other </p>

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2.3. Test references

All tests results were evaluated as per below standards, unless stated otherwise on test results sheets.

Execution of tests will be made in compliance with applicable standards. When standards are not specific, tests will be done following IGIENAIR internal procedures.

IGIENAIR keeps its right to change the order of tests based on site conditions to avoid delays of the project.

Tests	Standard	Applicable
AERAULIC PARAMETERS		
Airflow laminarity	ISO 14644-1	<input type="checkbox"/>
Air flow rates	ASHRAE STD 170	<input type="checkbox"/>
Air Changes Rate	ASHRAE STD 170	<input type="checkbox"/>
Rooms differential pressure	ASHRAE STD 170	<input type="checkbox"/>
Air flow visualization	-	<input type="checkbox"/>
AIR CLEANLINESS LEVEL		
Particle count	ISO 14644-1	<input checked="" type="checkbox"/>
HEPA & ULPA FILTER INTEGRITY TESTS		
Filter installations	VISUAL	<input type="checkbox"/>
Filter integrity test using EMERY	ISO 14644-3	<input type="checkbox"/>
MICROBIOLOGY TESTS		
SURFACE SAMPLING	USFDA-CCFRA	<input type="checkbox"/>
AIR SAMPLING	NIOSH	<input type="checkbox"/>

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2.4. ISO CLEANROOM CLASSIFICATION

Cleanrooms are classified according to the cleanliness level of the air inside them. The cleanroom class is the level of cleanliness the room complies with, according to the quantity and size of particles per volume of air. ISO classification system is ISO 14644-1. This standard includes the cleanroom classes ISO 1, ISO 2, ISO 3, ISO 4, ISO 5, ISO 6, ISO 7, ISO 8 and ISO 9, with ISO 1 being the “cleanest” and ISO 9 the “dirtiest” class (but still cleaner than a regular room). The most common classes are ISO 7 and ISO 8. The table below indicates the maximum concentration of particles of different sizes in each ISO class.

Table 1 — Selected airborne particulate cleanliness classes for cleanrooms and clean zones

ISO classification number (N)	Maximum concentration limits (particles/m ³ of air) for particles equal to and larger than the considered sizes shown below (concentration limits are calculated in accordance with equation (1) in 3.2)					
	0,1 µm	0,2 µm	0,3 µm	0,5 µm	1 µm	5 µm
ISO Class 1	10	2				
ISO Class 2	100	24	10	4		
ISO Class 3	1 000	237	102	35	8	
ISO Class 4	10 000	2 370	1 020	352	83	
ISO Class 5	100 000	23 700	10 200	3 520	832	29
ISO Class 6	1 000 000	237 000	102 000	35 200	8 320	293
ISO Class 7				352 000	83 200	2 930
ISO Class 8				3 520 000	832 000	29 300
ISO Class 9				35 200 000	8 320 000	293 000

NOTE: Uncertainties related to the measurement process require that concentration data with no more than three significant figures be used in determining the classification level.

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1.1. Test conditions

Unless stated otherwise all tests were done per conditions listed in the table below and as per the following definitions:

At rest : Installations completed and equipment running with no personnel present.

In operation : Installations completed and equipment running. Personnel present and working as per regular procedures

Tests	Conditions	Applicable
AERAULIC PARAMETERS		
Airflow laminarity	At rest	<input type="checkbox"/>
Air flow rates	At rest	<input type="checkbox"/>
Air Changes Rate	At rest	<input type="checkbox"/>
Rooms differential pressure	At rest	<input type="checkbox"/>
Air flow visualization	At rest	<input type="checkbox"/>
AIR CLEANLINESS LEVEL		
Particle count	At rest; 0.5 µm; 1.0 µm; 5.0 µm.	<input checked="" type="checkbox"/>
HEPA & ULPA FILTER INTEGRITY TESTS		
Filter installations	Visual	<input type="checkbox"/>
Filter integrity test	EMERY	<input type="checkbox"/>
MICROBIOLOGY TESTS		
Surface sampling	At rest	<input type="checkbox"/>
Air sampling	At rest	<input type="checkbox"/>

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2. REPORT PARTICULARS

2.1. Validity

This report defines the performance at the time of testing.

The results are shown compliant or non-compliant as per above mentioned criteria.

This report is only valid for the tested rooms.

2.2. Special notes

The test was done on the unit performance as a whole and is not a filter classification report nor a validation of its design.

2.3. Color coding

All test results will be color coded as follows

COMPLIANT	(C)
COMPLIANT BUT ON THE LIMIT OF ACCEPTABLE RANGE.	(C/L)
NON COMPLIANT	(NC)

For more details see document IGIENAIR – ACC-DOC-021

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3. TESTING

3.1. Methodology and results.

Setup

The air purifier was placed at the center of an operation theatre show room with the following dimension: L 5.6m, W 4.8m, H 2.9. The total volume of the room is approximately 78 cubic meters. The air purifier was set to the highest fan speed, hence 800 cubic meters per hour yielding approximately 10 air changes per hour.

A particle counter was placed at a representative location in the room.

The room was evacuated to perform the testing at rest.

The HVAC system in the room was turned off.

First particle count - Air purifier off.

In the first phase of measurements, the air purifier was off and 20 samples of 50 liters each were taken (1 min sampling as a minimum sampling as per ISO 14644) as per the standard procedure ISO 14644. The total duration of the sampling was 40 minutes. The readings showed a steady concentration of particles in the room.

The concentration level was in the ISO 9 Class.

Second particle count - Air purifier on.

In the first phase of measurements, the air purifier was turned on and 20 samples of 50 litres each were taken (1 min sampling) as per the standard procedure ISO 14644. The total duration of the sampling was 40 minutes. The readings showed a decrease of concentrations of particles in the room to reach ISO 8 level after 30 minutes of operation.

Room class improved from ISO 9 to ISO 8 in approximately 30 minutes.

And the concentrations kept going down for the whole duration of the sampling and after 40 minutes, the particle removal rates were:

0.5 Microns 52% eliminated

1.0 Microns 51% eliminated

5.0 Microns 65% eliminated

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3.2. Particle counter data

	0.5 MICRONS			1.0 MICRONS			5.0 MICRONS		
	ISO 8	Dopair off	Dopair on	ISO 8	Dopair off	Dopair on	ISO 8	Dopair off	Dopair on
T0	3,520,000	4,017,160	3,862,380	832,000	1,540,900	1,496,660	29,300	9,400	5,040
T2	3,520,000	3,996,420	3,683,560	832,000	1,540,360	1,434,160	29,300	9,720	5,180
T4	3,520,000	4,061,380	3,500,960	832,000	1,564,380	1,358,400	29,300	8,380	4,640
T6	3,520,000	4,031,520	3,259,900	832,000	1,557,040	1,265,980	29,300	8,760	3,920
T8	3,520,000	4,029,280	3,134,180	832,000	1,546,120	1,212,960	29,300	8,800	4,000
T10	3,520,000	4,016,660	2,998,040	832,000	1,541,980	1,163,980	29,300	8,440	3,260
T12	3,520,000	4,033,060	2,853,600	832,000	1,545,540	1,100,600	29,300	7,400	3,780
T14	3,520,000	4,050,140	2,757,860	832,000	1,549,540	1,063,700	29,300	6,920	3,200
T16	3,520,000	4,013,100	2,629,220	832,000	1,533,060	1,019,580	29,300	6,500	3,120
T18	3,520,000	4,031,740	2,546,940	832,000	1,542,800	986,120	29,300	6,680	2,560
T20	3,520,000	4,005,940	2,447,220	832,000	1,536,180	953,620	29,300	6,400	2,700
T22	3,520,000	4,030,420	2,396,340	832,000	1,548,140	930,620	29,300	6,960	2,620
T24	3,520,000	3,990,100	2,301,660	832,000	1,520,320	899,460	29,300	7,140	2,520
T26	3,520,000	4,041,940	2,218,720	832,000	1,549,300	866,780	29,300	5,560	2,400
T28	3,520,000	4,064,300	2,128,540	832,000	1,553,560	828,040	29,300	6,280	2,140
T30	3,520,000	4,088,400	2,109,080	832,000	1,580,060	825,180	29,300	4,980	2,060
T32	3,520,000	4,097,040	2,027,900	832,000	1,583,740	801,460	29,300	5,840	1,580
T34	3,520,000	4,109,000	1,960,180	832,000	1,589,280	769,180	29,300	5,380	2,060
T36	3,520,000	4,198,860	1,917,620	832,000	1,631,280	760,360	29,300	5,500	1,760
T38	3,520,000	4,237,780	1,864,920	832,000	1,650,000	732,440	29,300	5,320	1,780
average		4,057,212	2,629,941		1,560,179	1,023,464		7,018	3,016
reduction	-		52%	-		51%	-		65%

Concentration in particles per cubic meter.

Values in red do not meet ISO 8 LEVEL.

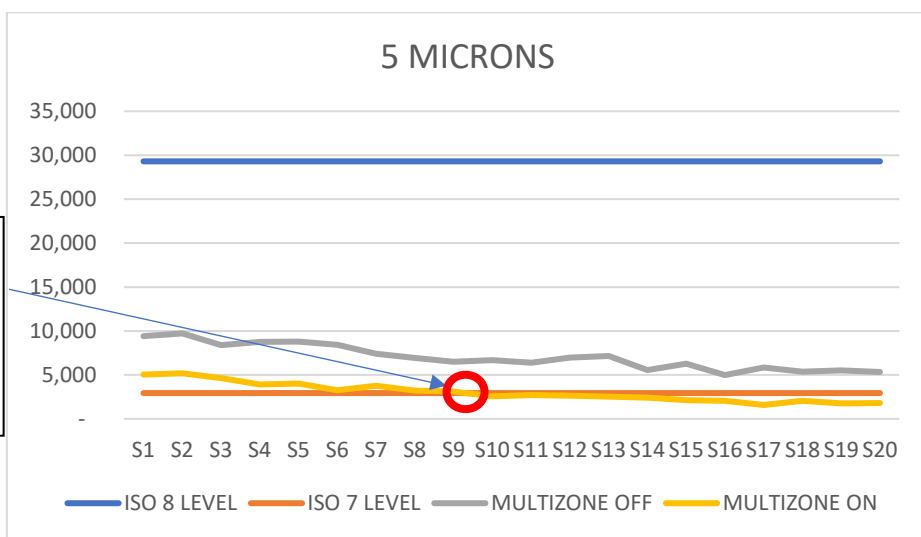
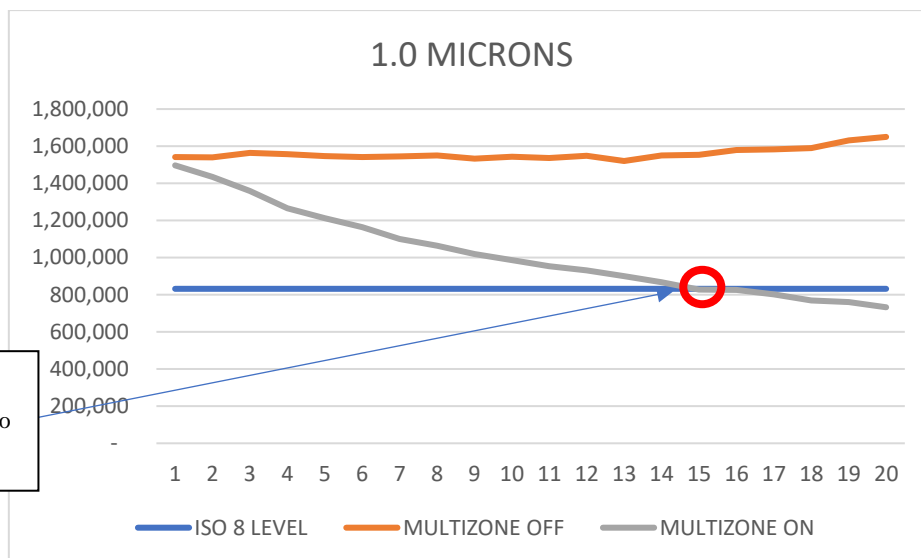
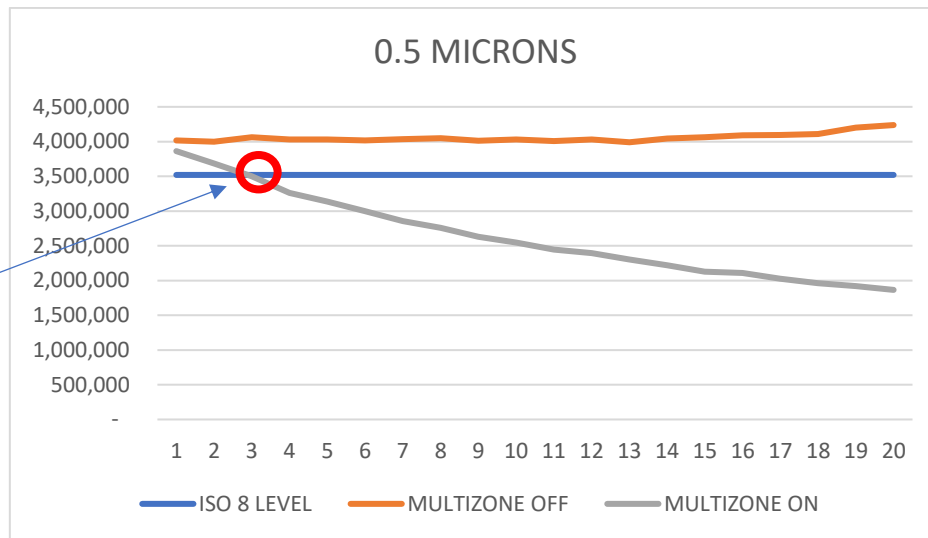
Values in green meet ISO 8 LEVEL.

T0: First sample.

T38: 20th sample. approximately at minute 38.

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3.3. Charts



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4. CONCLUSION.

The performance check was done in a 26 square meters, 78 cubic meters operating theatre in a medical center in Dubai, UAE. Since our goal was to check the performance of the air purifier and not to perform a full classification of the room, sampling was done in one location only.

Room ISO class improved from ISO 9 to ISO 8 in 30 minutes.

As the unit kept running, the air quality kept improving and the particle concentrations kept dropping through all the 40 minutes of sampling. At the end of 40 minutes, a reduction of particles as follows was noted.

0.5 Microns 52% eliminated

1.0 Microns 51% eliminated

5.0 Microns 65% eliminated

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5. ANNEXES

5.1. Annex A - Photos



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5.2. Annex B – Particle count tickets

<p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 1 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:24:04 4817168 1548988 9480 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 2 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:26:03 3996428 1548268 9728 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 3 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:28:02 4861288 1564288 8388 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 4 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:30:01 4831528 1557848 8768 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 5 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:32:00 4829288 1546128 8888 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 6 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:33:59 4816668 1541988 8448 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 7 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:35:58 4833868 1545548 7488 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 8 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:37:57 4858148 1549548 6928 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 9 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:39:56 4812188 1533868 6588 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 10 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:41:55 4831748 1542888 6688 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 11 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:43:54 4885948 1536188 6488 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 12 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:45:53 4838428 1548148 6968 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 13 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:47:52 3998188 1528228 7148 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 14 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:49:51 4841948 1549388 5568 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 15 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:51:50 4864288 1553568 6288 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 16 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:53:49 4888488 1588668 4988 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 17 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:55:48 4897848 1583748 5848 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 18 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:57:47 4189888 1589288 5388 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 19 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 18:59:46 4198868 1631288 5388 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR OFF SAMPLE VOL= 50.5 SBL SAMPLE= 20 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:01:45 4237788 1658888 5328 50.5</p>	<p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 1 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:03:02 3862388 1496668 5848 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 2 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:07:01 3683568 1434168 5188 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 3 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:09:00 3589968 1359488 4648 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 4 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:10:59 3259988 1265988 4928 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 5 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:12:58 3134188 1219368 4888 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 6 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:14:57 2998848 1163988 3268 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 7 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:16:56 2853888 1188668 3788 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 8 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:18:55 2757868 1863788 3288 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 9 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:20:54 2629228 1819588 3128 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 10 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:22:53 2546948 986128 2568 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 11 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:24:52 2447228 953628 2788 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 12 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:26:51 2396348 938628 2628 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 13 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:28:50 2381668 894668 2528 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 14 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:30:49 2218728 866788 2488 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 15 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:32:48 2128548 828848 2148 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 16 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:34:47 2189888 825188 2868 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 17 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:36:46 2027988 881468 1588 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 18 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:38:45 1968188 765188 2868 51.0</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 19 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:40:44 1917628 768368 1768 50.5</p> <p>PROGRAM= 21/07/20 ID= ATA DOPAIR ON SAMPLE VOL= 50.5 SBL SAMPLE= 20 COUNTS/CM TIME 10.5 11.0 15.0 FLOW 11:42:43 1864928 732448 1788 50.5</p>
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5.3. Annex B – Particle counter calibration certificate

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CONSTAT DE VERIFICATION: COMPTEUR DE PARTICULES CALIBRATION CERTIFICATE: PARTICLES COUNTER

N° 2020-03-09-01

Mode opératoire : ACC-DOC-082

1. IDENTIFICATION DU MATERIEL / CALIBRATED INSTRUMENT

Type de Matériel / Designation	Compteur de Particules / Particles Counter
Marque & modèle / Type	CLIMET CI-450t
Numéro de Série / Serial Number	104182
Identification	IUA-CPT-10-03
Propriétaire / Owner	IGIENAIR MIDDLE EAST

2. CONDITIONS AMBIANTES DE MESURE / AMBIANT CONDITIONS

21,1°C ; 989 hPa

3. MATERIEL DE REFERENCE / REFERENCE INSTRUMENT

Désignation / Designation	Identification	Date de fin de Validité / Date of issue
Particules 0,3 µm	NANOSPHERE 303 nm Lot 189903	01/10/2020
Particules 0,5 µm	NANOSPHERE 508 nm Lot 193188	01/01/2021
Particules de 1,0 µm	MICROSPHERE 994 nm Lot 193291	01/01/2021
Particules 5,0 µm	MICROSPHERE 5027 nm Lot 194633	01/02/2021
Débitmètre / Flowmeter	IRA-DEB-16-01	08/08/2020
Compteur de particules / Particles Counter	IRA-CPT-13-04	26/09/2020

Remarques / Remarks:

Absence de filtre absolue dans la mallette.
No absolute filter in the case.

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4. TESTS METROLOGIQUES / METROLOGIC TESTS

Paramètre / Parameter	Valeur cible / Target value	Valeur lue / Read value (L.min-1)	Incertitude / Uncertainty (k=2)	Conformité / Results
Débit / Flow	50 ± 2,5 L.min-1	49,71	0,69	CONFORME / PASS
Taux de faux comptage / False Count Rate	≤ 3 particules sur 10 minutes / ≤ 3 particules on 10 minutes	1	/	CONFORME / PASS

Paramètre / Parameter	Valeur cible / Target value	NRef particules (total count)	Ni particules (total count)	Efficacité / Efficiency Ni/Nref	Incertitude / Uncertainty (± %)	Conformité / Results
Efficacité de comptage à 0,3 µm	100% ± 20%	56800	67941	119,6%	12,3%	CONFORME / PASS
Efficacité de comptage à 0,5 µm	100% ± 10%	32622	30719	94,2%	17,7%	CONFORME / PASS
Efficacité de comptage à 1,0 µm	100% ± 10%	42729	38579	90,3%	9,7%	CONFORME / PASS
Efficacité de comptage à 5,0 µm	100% ± 10%	3280	3534	107,7%	11,5%	CONFORME / PASS

Critères de conformité / Conformity Standards :

Efficacité à / Efficiency at 0,3 µm: 80 % < Valeur / Value < 120 %

Efficacité à / Efficiency at 0,5 - 1 - 5 µm: 90 % < Valeur / Value < 110 %

Incertitude avec k=2 / Uncertainty with k=2

5. CONCLUSION

Date d'étalonnage / Calibration date: 09/03/2020

L'appareil est déclaré / Instrument is: CONFORME

Validité d'étalonnage / End of validity: 09/03/2021

Signature: Eloi GRAND

Responsable métrologie



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