

International Ozone Technologies Group, Inc.

Titan Hydroxyl Generator

OZONE TEST REPORT

SCOPE OF WORK

Ozone Emissions Testing of Household Electrostatic Air Cleaners for Model: 4000

REPORT NUMBER

104011073CRT-002

ISSUE DATE

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QUOTE NUMBER

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DOCUMENT CONTROL NUMBER

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TEST REPORT FOR INTERNATIONAL OZONE TECHNOLOGIES GROUP, INC.

Report No.: 104011073CRT-002

Date: August 6, 2019

Johnathan McCubbin
International Ozone Technologies Group, Inc.
11 S.W. 10th Street, Suite J
Delray Beach, FL 33444
USA

Phone: (561) 733-8955
Email: johnm@internationalozone.com

SECTION 1

SUMMARY

The representative sample(s) have been tested, investigated, and found to comply with the requirements of the following Standard(s):


Electrostatic Air Cleaners, UL 867, Section 40, Fifth Edition, August 4, 2011 revision: September 16, 2016.


The equipment identified in this report has been found to meet the criteria for emittance of ozone not exceeding a concentration of 0.050 ppm. Furthermore, a second sample was not required to be tested, according to UL 867, as the first sample's maximum emissions were less than 0.030 ppm, which satisfies the exception in the Section 40.1.1.

This report completes our evaluation covered by Intertek Project Number G104011073 which has been authorized by Intertek quote number: Qu-00992238-2. If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

OZONE EMISSIONS SUMMARY

FAN SPEED	FILTER(S)	O3/VOLTAGE SETTING	C(t) _{max} [ppm]
ON	YES	-	0.004
ON	NO	-	0.002

Completed by: Joseph Hartley
Title: Technician II
Signature: 
Date: 8/5/2019

Reviewed by: Jacob Langenbacher
Title: Engineer
Signature: 
Date: 8/6/2019

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CHAMBER EQUIPMENT INFORMATION**TEST EQUIPMENT LIST**

Instrument	Model	Intertek Ctrl #	Cal Due Date
Teledyne – Advanced Pollution Instrumentation Ozone Calibrator	703E	O200	09-28-2019
Teledyne – Advanced Pollution Instrumentation Ozone Monitor	400E	O202	*
Vaisala – Temperature & Humidity Transducer	HMD-70Y	T1307	06-04-2020
Fluid Components International- Flow meter	ST75V	D713	08-28-2019

* The 400E Ozone Monitor is calibrated using the 703E calibrator.

SECTION 3

UNIT UNDER TEST INFORMATION

MODEL INFORMATION			
Manufacturer:	INTERNATIONAL OZONE TECHNOLOGIES GROUP, INC	Pre-Filter:	No
Model Number:	4000	HEPA Filter:	No
Production/Prototype/Design	Production	Photocatalytic Filter:	Yes
Fan Speeds:	1	Carbon Filter:	No
O3/Voltage Settings:	-	UV Light:	Yes
O3 Monitor:	-	Ionizer:	No
Model Notes:	Filter is an "TiO2 Photocatalytic Electrostatic Air Filter" Filter Model# EF-1/2		

RUN-IN TEST			
FIRST SAMPLE			
Run-in Start:	7/26/2019 10:00 AM	Run-in End:	7/28/2019 3:00 PM
Run-in Temperature:	77 ± 4 degF	Tracking Number:	CRT1907161050-001
Serial Number:	TZ-32021	Manufacture Date:	06/2019
Sample Notes:	Unit has a single fan speed.		
SECOND SAMPLE			
Run-in Start:	NA	Run-in End:	NA
Run-in Temperature:	NA	Tracking Number:	NA
Serial Number:	NA	Manufacture Date:	NA
Sample Notes:	Per the exception listed under clause 40.1.1 of UL 867, the second sample was not required to be tested.		

SECTION 4

PEAK OZONE TEST

GRILL AND AIR PERIPHERY DIMENSIONS			
		Date of Test:	7/30/2019
Grill Diameter:	20.000	Air Periphery Diameter:	20.000
Estimated Grill Area:	314.159	Est. Air Periphery Area:	314.159
Notes:	Measurements are in Inches		

PEAK LOCATION			
	Loc.	X	Y
	-	[inches]	[inches]
	1	0	6.5
	2	-4.75	4.75
	3	4.75	4.75
	4	-6.5	0
	5	0	0
	6	6.5	0
	7	-4.75	-4.75
	8	4.75	-4.75
9	0	-6.5	
* Location measurements are coordinates in reference to the center point.			

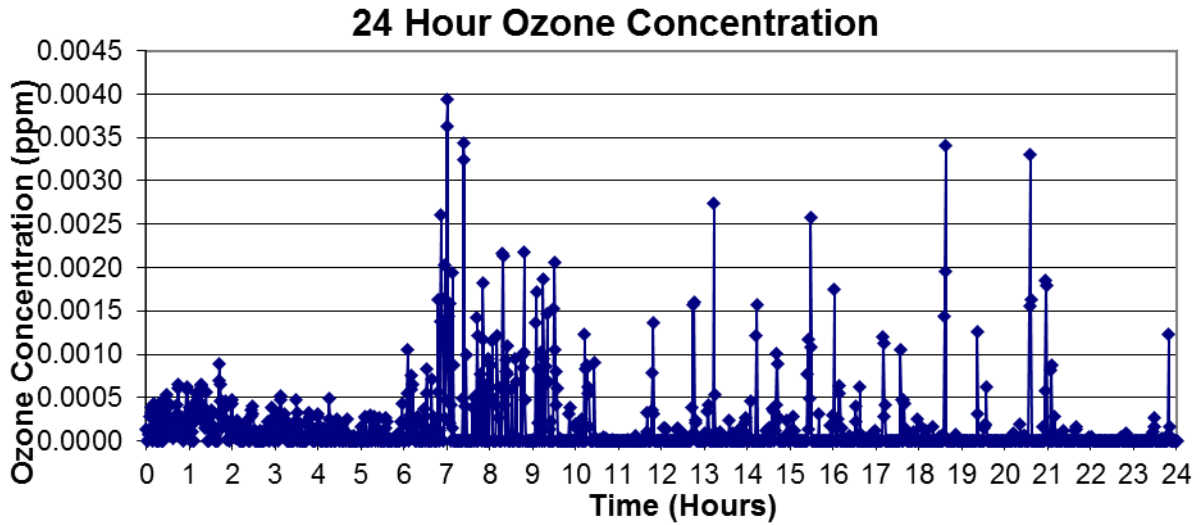
PEAK OZONE CONCENTRATIONS (ppm)				
Location	With Filter(s)		Without Filter(s)	
	ON		ON	
1	0.0001		0.0005	
2	0.0003		0.0003	
3	0.0001		0.0000	
4	0.0003		0.0002	
5	0.0000		0.0006	
6	0.0004		0.0004	
7	0.0003		0.0003	
8	0.0005		0.0003	
9	0.0002		0.0000	

Note: Peak Ozone Test concentrations are shown with background subtracted.

SECTION 5

MAX OZONE TEST

START DATE OF TEST: 7/30/2019
 SAMPLE: First Sample
 FAN SPEED: ON
 FILTER(S): ESP Filter Installed, UV lights on

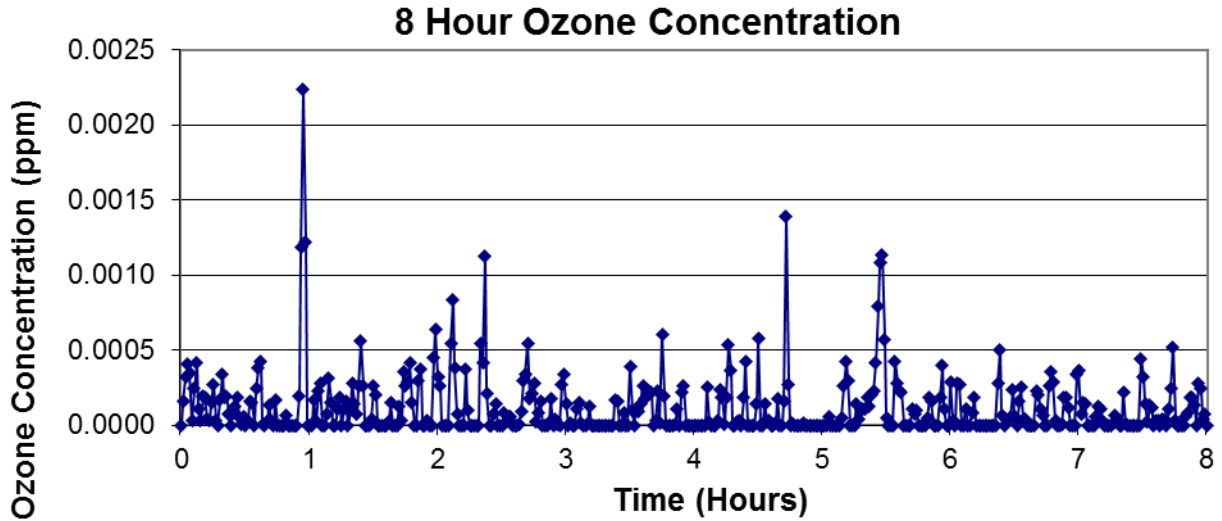


MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.001	0.001	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.000	0.000	0.004	0.004	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.000	0.000	0.002	0.002	[ppm]
Chamber Temperature:	40.4.2	PASS	80	79	80	1	[degF]
Chamber Humidity:	40.4.2	PASS	50	50	51	1	[%RH]
Chamber Static Pressure:	-	PASS	0.02	-0.01	0.04	0.05	["H2O]
Chamber Supply Air Flow:	-	-	20	19	20	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	24 hours					

NOTES: Peak Test Location 8

MAX OZONE TEST

START DATE OF TEST: 7/31/2019
 SAMPLE: First Sample
 FAN SPEED: ON
 FILTER(S): ESP Filter removed, UV light ON



MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.001	0.000	0.001	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.000	0.000	0.002	0.002	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.000	0.000	0.001	0.001	[ppm]
Chamber Temperature:	40.4.2	PASS	79	79	80	1	[degF]
Chamber Humidity:	40.4.2	PASS	50	50	51	1	[%RH]
Chamber Static Pressure:	-	PASS	0.02	-0.01	0.03	0.05	["H2O]
Chamber Supply Air Flow:	-	-	20	19	20	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	8 hours					

NOTES: Peak Test Location 5

SECTION 6

APPENDIX

DATA FILES

TEST NAME	RAW DATA FILE
Model Half Life	3896 Halflife.csv
Max Ozone: ON w/ Filter	3897 Max On ozonelog.csv
Max Ozone: ON w/o Filter	3898 Max ON ozonelog.csv

ATTACHMENT DOCUMENTS

DOCUMENT	SOFT-COPY FILE NAME
ARB Application	NA
Chain of Custody: Sample 1	COC_CRT1907161050-001.pdf

UUT PHOTOGRAPHS

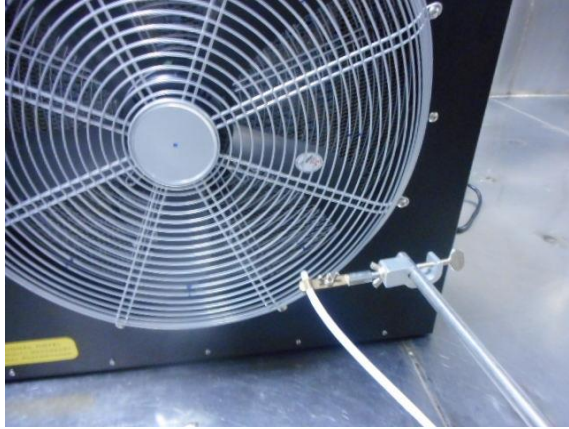


UUT



Nameplate

UUT PHOTOGRAPHS: PEAK TEST



Location 8

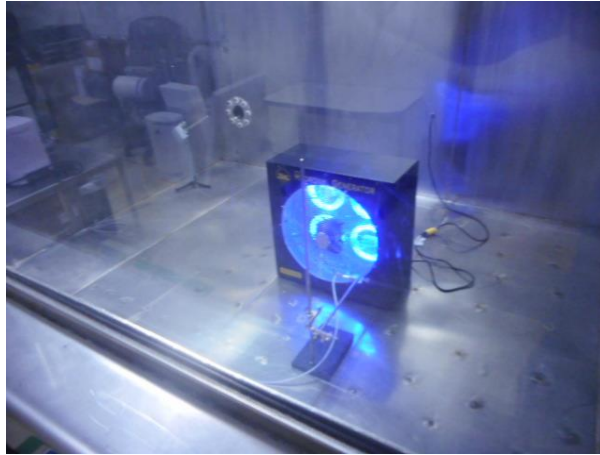
On w/ FILTER



Location 5

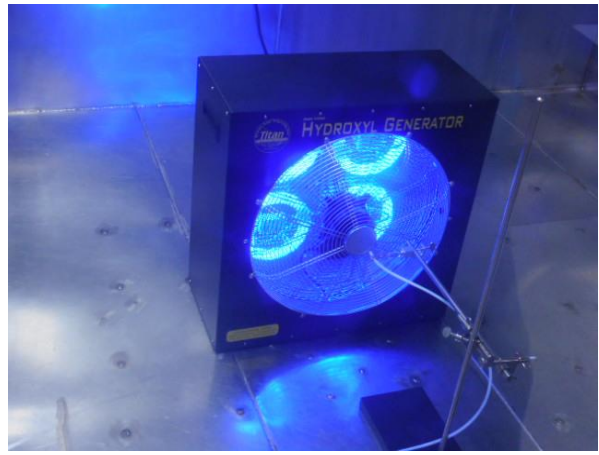
ON w/o FILTER

UUT PHOTOGRAPHS: MAX OZONE TESTS



Location 8

ON w/ FILTER



Location 5

ON w/o FILTER

7.0 REVISION SUMMARY

Date/Proj # Site ID	Project Handler/ Reviewer	Section	Description of Change
			None