

Engineering Dynamics LTD

OZONE TEST REPORT

SCOPE OF WORK

Ozone Emissions Testing of Household Electrostatic Air Cleaners for Model: P 2000

REPORT NUMBER

105067170CRT-001

ISSUE DATE

5/31/2022

PAGES

11

QUOTE NUMBER

Qu-01268618-0-1

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TEST REPORT FOR ENGINEERING DYNAMICS LTD

Report No.: 105067170CRT-001

Date: May 31, 2022

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SECTION 1

SUMMARY

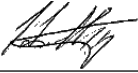

The representative sample(s) have been tested, investigated, and found to comply with the requirements of the following Standard(s):

Electrostatic Air Cleaners, UL 867, Section 40, Fifth Edition, August 4, 2011 revision: August 16, 2021

CSA C22.2#187:2020 Ed.5, Section 7, February 2015, January 2020 Revision

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 G105067170 which has been authorized by Intertek quote number: Qu-01268618-0-1. 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			
UNIT POWER	FILTER(S)	O3/VOLTAGE SETTING	C(t) _{max} [ppm]
ON	YES	24v AC	0.001
ON	NO	24v AC	0.001
Highest 8-hour time weighted average: 0.000[ppmv]			
Completed by:	Joseph Hartley	Reviewed by:	Michael Hudon
Title:	Technician I	Title:	Staff Engineer
Signature:		Signature:	
Date:	5/31/2022	Date:	31 May 2022

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SECTION 2

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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	08-24-2022
Teledyne – Advanced Pollution Instrumentation Ozone Monitor	T400	D804	*
Rotronic Log-HC2	HC2	309-T1538-2/T1538-1	03-02-2023
Vaisala – Temperature & Humidity Transducer	HMD-70Y	T1307	05-24-2022 (Indication Only)
Fluid Components International- Flow meter	ST75V	D713	10-13-2022

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

SECTION 3

UNIT UNDER TEST INFORMATION

MODEL INFORMATION			
Manufacturer:	Engineering Dynamics LTD	Pre-Filter:	Yes
Model Number:	P 2000	HEPA Type Filter:	Yes
Production/Prototype/Design	Production	ESP Filter:	No
Fan Speeds:	NA	Carbon Filter:	Yes
O3/Voltage Settings:	24v AC	UV Light:	No
O3 Monitor:	-	Ionizer:	Yes
Model Notes:	Unit has no Fans. Unit is in-duct. Power was supplied to sample by class 2 power supply with an output value of 24v AC. Pre-filter screen will remain installed during no filter testing as it is part of the chassis. Unit was tested in a horizontal position to represent a worst case scenario.		

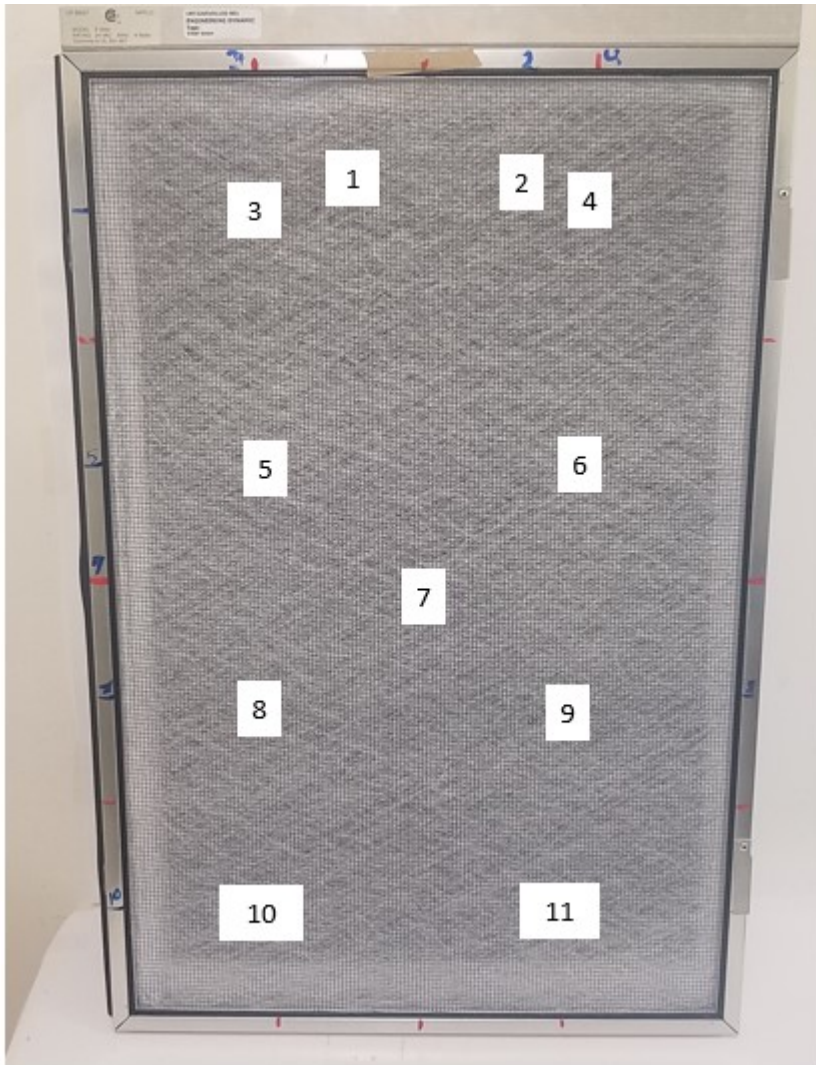
RUN-IN TEST			
FIRST SAMPLE			
Run-in Start:	5/19/2022 12:48 AM	Run-in End:	5/23/2022 8:45 AM
Run-in Temperature:	77 +/-4	Tracking Number:	CRT2205191130-001
Serial Number:	NA	Manufacture Date:	05/11/2022
Sample Notes:			
SECOND SAMPLE			
Run-in Start:	NA	Run-in End:	NA
Run-in Temperature:	NA	Tracking Number:	CRT2205191130-002
Serial Number:	NA	Manufacture Date:	05/11/2022
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:	05/25/2022
Grill Height:	27.125	Air Periphery Height:	27.125
Grill Width:	17.625	Air Periphery Width:	17.625
Estimated Grill Area:	478.078	Est. Air Periphery Area:	478.078
Notes:	Measurements are in Inches		

PEAK LOCATION			
Loc.	X	Y	
-	[inches]	[inches]	
1	-1.88	10.75	
2	1.88	10.75	
3	-4.30	10.13	
4	4.30	10.13	
5	-4.30	3.25	
6	4.30	3.25	
7	0.00	0.00	
8	-4.30	-3.25	
9	4.30	-3.25	
10	-4.30	-10.13	
11	4.30	-10.13	
* Location measurements are coordinates in reference to the center point.			



PEAK OZONE CONCENTRATIONS (ppm)				
Location	<i>With Filter(s)</i>		<i>Without Filter(s)</i>	
	<i>ON</i>		<i>ON</i>	
1	0.0000		0.0004	
2	0.0006		0.0006	
3	0.0001		0.0001	
4	0.0009		0.0009	
5	0.0000		0.0008	
6	0.0005		0.0008	
7	0.0002		0.0005	
8	0.0004		0.0003	
9	0.0000		0.0005	
10	0.0004		0.0006	
11	0.0001		0.0001	

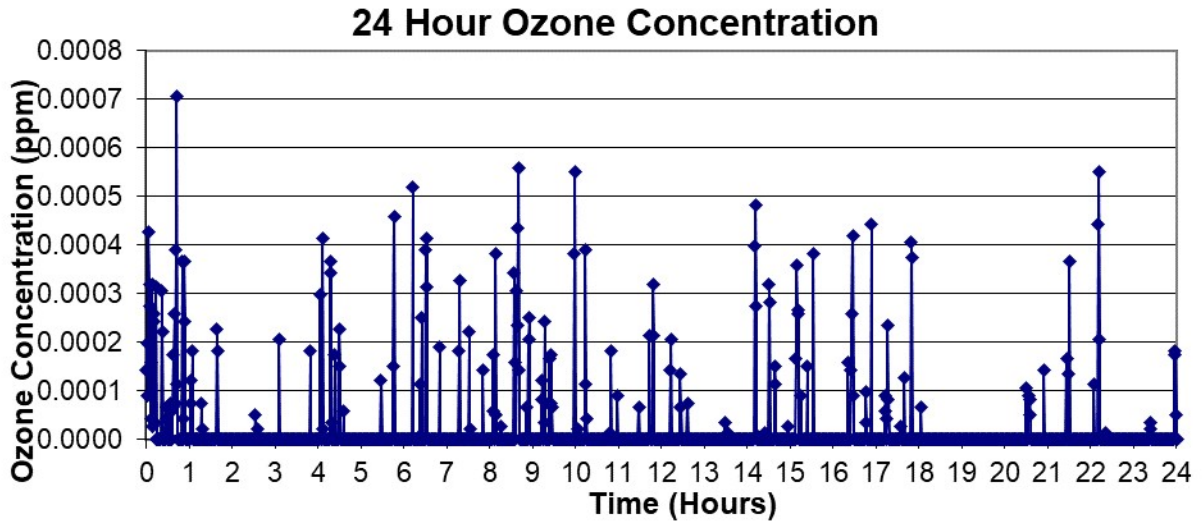
shown with background subtracted.

Note: Peak Ozone Test concentrations are

SECTION 5

MAX OZONE TEST

START DATE OF TEST: 5/25/2022
 SAMPLE: First Sample
 FAN SPEED: NA
 FILTER(S): Pre-filter, Carbon and HEPA filters installed, Ionizer ON

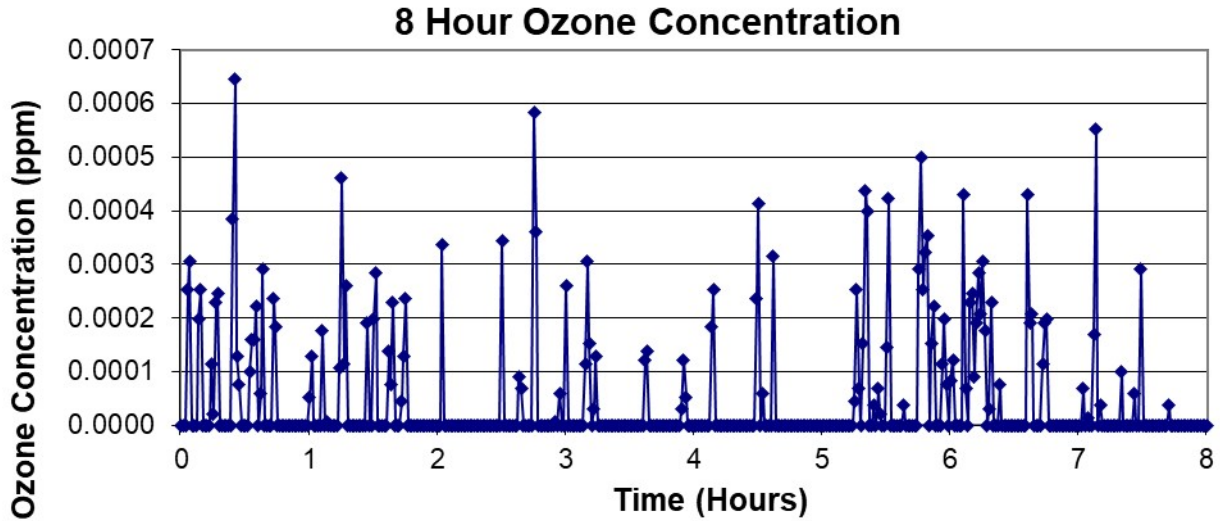


MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.001	0.001	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.000	0.000	0.001	0.001	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.000	0.000	0.001	0.001	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	78	1	[degF]
Chamber Humidity:	40.4.2	OK*	45	42	46	4	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.00	0.03	0.04	["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 4 Highest 8-hour time-weighted average: 0.000 [ppmv]
 All 8-hour time-weighted averages:
 0h-8h: 0.000 [ppmv]
 8h-16h: 0.000 [ppmv]
 16h-24h: 0.000 [ppmv]
 * Humidity will not impact the pass/fail result

MAX OZONE TEST

START DATE OF TEST: 5/26/2022
 SAMPLE: First Sample
 FAN SPEED: NA
 FILTER(S): Pre-filter installed, Carbon and HEPA filters removed, Ionizer 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	0.001	0.001	[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	77	77	78	1	[degF]
Chamber Humidity:	40.4.2	OK*	45	42	46	4	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.00	0.03	0.04	["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 4 * Humidity will not impact the pass/fail result

SECTION 6

APPENDIX

DATA FILES

TEST NAME	RAW DATA FILE
Model Half Life	4951 Halflife ozonelog.csv
Max Ozone: ON w/ Filter	4952 Max ONWIF ozonelog.csv
Max Ozone: ON w/o Filter	4953 Max ONWOF ozonelog.csv

ATTACHMENT DOCUMENTS

DOCUMENT	SOFT-COPY FILE NAME
ARB Application	NA
Chain of Custody: Sample 1	COC_CRT2205191130-001.pdf
Chain of Custody: Sample 2	COC_CRT2205191130-001.pdf

UUT PHOTOGRAPHS



UUT



Nameplate

UUT PHOTOGRAPHS: PEAK TEST



Location 4
ON w/ FILTER



Location 4

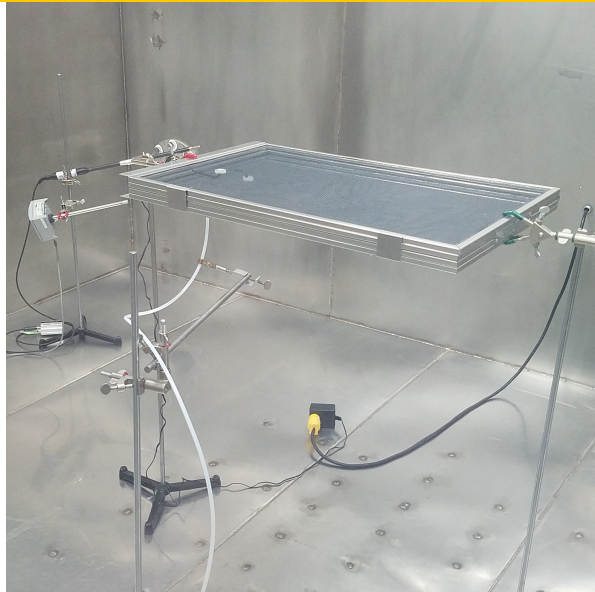
ON w/o FILTER

UUT PHOTOGRAPHS: MAX OZONE TESTS



Location 4

ON w/ FILTER



Location 4

ON w/o FILTER

7.0 REVISION SUMMARY

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