

Wellis Co., Ltd.

OZONE TEST REPORT

SCOPE OF WORK

Ozone Emissions Testing of Household Electrostatic Air Cleaners for Model: WADU-02

REPORT NUMBER

103502990CRT-001

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180300086SEL

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TEST REPORT FOR WELLIS CO., LTD.

Report No.:103502990CRT-001

Date: April 30, 2018

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SECTION 1

SUMMARY

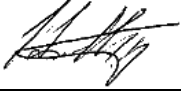
The representative sample(s) have been tested, investigated, and found to comply with the requirements of the following Standard(s):

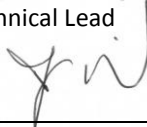
Electrostatic Air Cleaners, UL 867, Section 40, Fifth Edition, August 4, 2011 revision: September 16, 2016.

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 G103502990 which has been authorized by Intertek intercompany agreement. 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]
Operating	No	-	0.012
Night	No	-	0.015
Operating	Yes	-	0.016
Night	Yes	-	0.015

Completed by: Joseph Hartley
Title: Technician III
Signature: 
Date: 4/30/2018

Reviewed by: James Diescher
Title: Technical Lead
Signature: 
Date: 4/30/2018

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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	02-08-2019
Teledyne – Advanced Pollution Instrumentation Ozone Monitor	400E	O202	*
Vaisala – Temperature & Humidity Transducer	HMD-70Y	T1307	06-09-2018
Fluid Components International- Flow meter	ST75V	D713	08-16-2018

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

SECTION 3

UNIT UNDER TEST INFORMATION

MODEL INFORMATION			
Manufacturer:	Wellis Co., Ltd.	Pre-Filter:	No
Model Number:	WADU-02	HEPA Filter:	No
Production/Prototype/ Design	Production	ESP Filter:	No
Fan Speeds:	2	Carbon Filter:	No
O3/Voltage Settings:	-	UV Light:	No
O3 Monitor:	-	Ionizer:	Yes
Model Notes:	Unit uses Hydrogen Peroxide as a filter		

RUN-IN TEST			
FIRST SAMPLE			
Run-in Start:	4/25/2018 3:11 PM	Run-in End:	4/27/2018 3:30 PM
Run-in Temperature:	77 ± 4 degF	Tracking Number:	CRT1804251435-001
Serial Number:	NA	Manufacture Date:	NA
Sample Notes:			
SECOND SAMPLE			
Run-in Start:	NA	Run-in End:	NA
Run-in Temperature:	NA	Tracking Number:	NA
Serial Number:	NA	Manufacture Date:	CRT1804251435-002
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:	4/27/2018
Grill Height:	1.0	Air Periphery Height:	1.0
Grill Width:	5.0	Air Periphery Width:	5.0
Estimated Grill Area:	5 Sq. In	Est. Air Periphery Area:	5 Sq. In.
Notes:	Measurements are in Inches		

PEAK LOCATION			
Loc.	X	Y	
-	[inches]	[inches]	
1	-2.5	1	
2	2.5	1	
3	-2.5	0	
4	0	0	
5	2.5	0	
* Location measurements are coordinates in reference to the center point.			



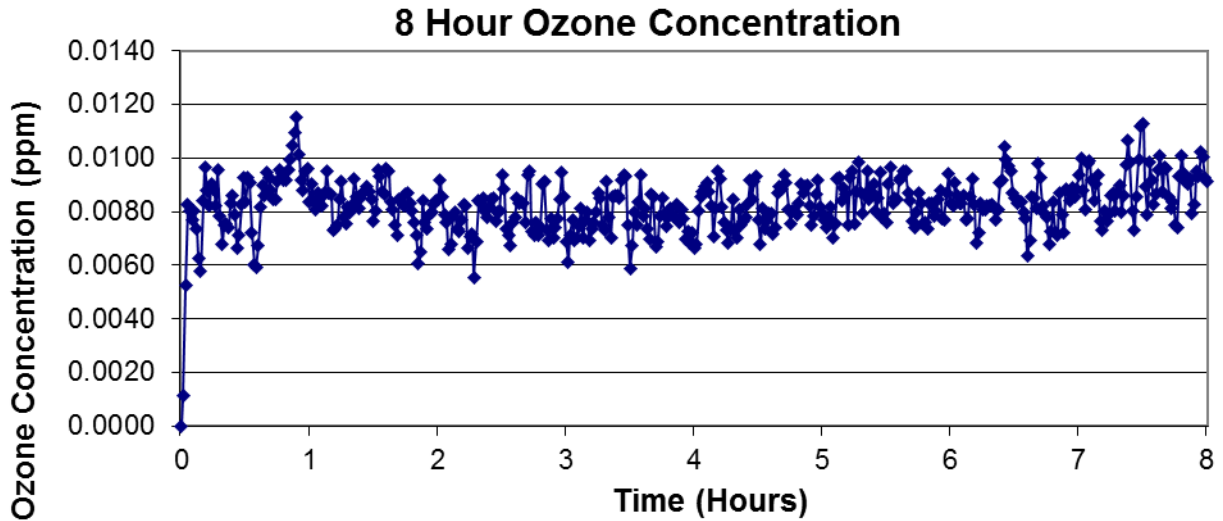
PEAK OZONE CONCENTRATIONS (ppm)				
Location	<i>Without Solution</i>		<i>With Solution</i>	
	<i>Highest</i>	<i>Lowest</i>	<i>Highest</i>	<i>Lowest</i>
1	0.0082	0.0123	0.0113	0.0105
2	0.0102	0.0110	0.0069	0.0085
3	0.0038	0.0031	0.0028	0.0038
4	0.0006	0.0008	0.0005	0.0003
5	0.0008	0.0012	0.0007	0.0011

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

SECTION 5

MAX OZONE TEST

START DATE OF TEST: 4/27/2018
 SAMPLE: First Sample
 FAN SPEED: Operation Mode
 FILTER(S): Ionizer ON, Peroxide Solution not open

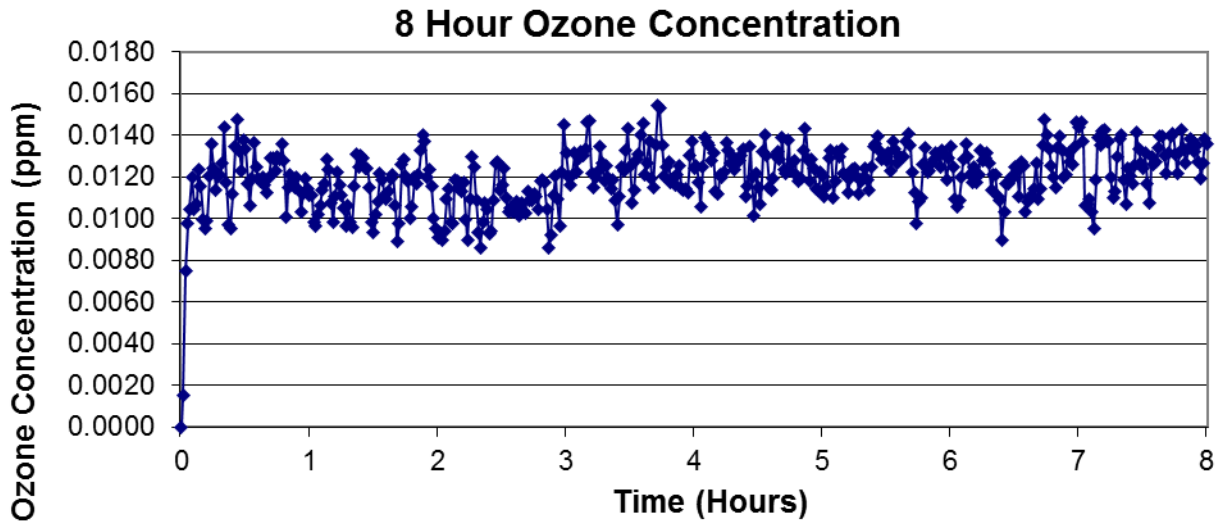


MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.002	0.001	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.008	0.000	0.012	0.012	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.008	0.001	0.011	0.009	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	0	[degF]
Chamber Humidity:	40.4.2	PASS	50	49	51	2	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.03	0.02	["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 2

MAX OZONE TEST

START DATE OF TEST: 4/28/2018
 SAMPLE: First Sample
 FAN SPEED: Night Mode
 FILTER(S): Ionizer ON, Peroxide Solution not open

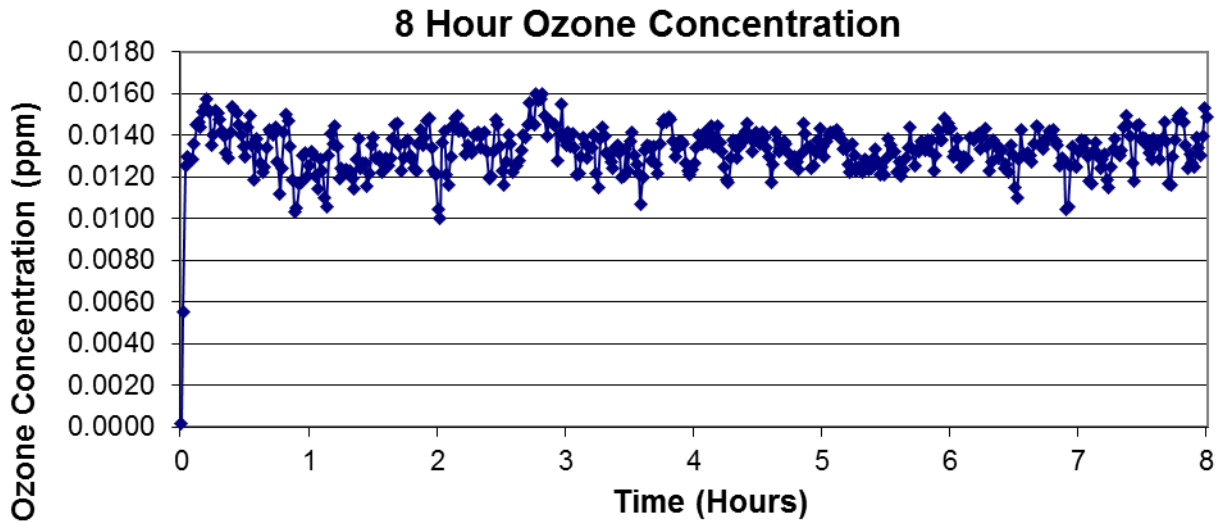


MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.002	0.001	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.012	0.000	0.015	0.015	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.012	0.001	0.014	0.013	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	50	49	50	1	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.03	0.02	["H2O]
Chamber Supply Air Flow:	-	-	20	20	20	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	8 hours					

NOTES: Peak Test Location 2

MAX OZONE TEST

START DATE OF TEST: 4/28/2018
 SAMPLE: First Sample
 FAN SPEED: Operating Mode
 FILTER(S): Ionizer ON, Peroxide solution open



MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.002	0.001	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.013	0.000	0.016	0.016	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.013	0.001	0.016	0.014	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	50	49	51	2	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.03	0.01	["H2O]
Chamber Supply Air Flow:	-	-	20	20	20	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	8 hours					

NOTES: Peak Test Location 1

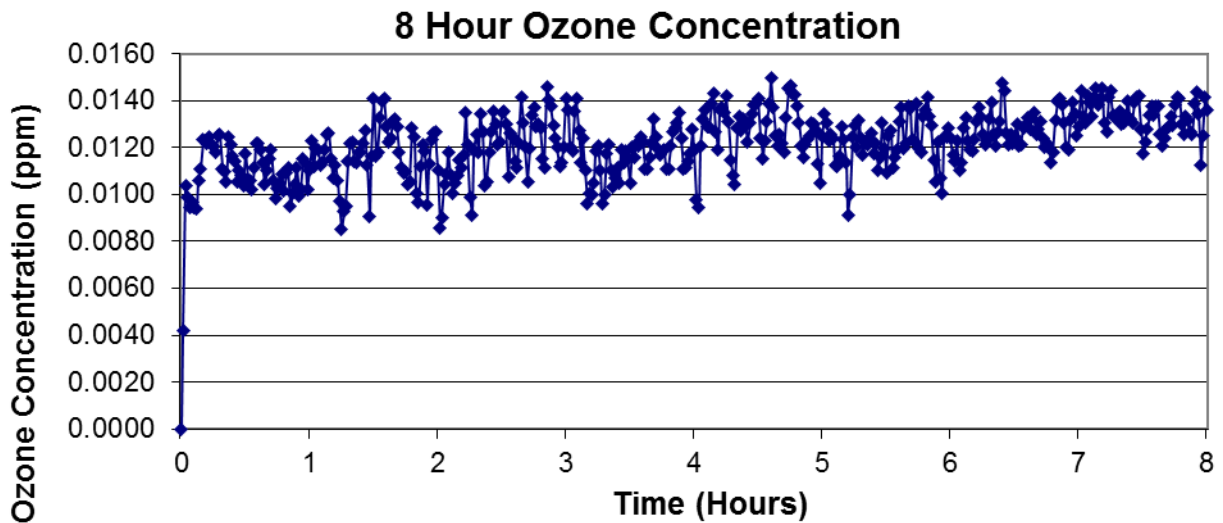
MAX OZONE TEST

START DATE OF TEST: 4/29/2018

SAMPLE: First Sample

FAN SPEED: Night Mode

FILTER(S): Ionizer ON, Peroxide solution open



MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.002	0.001	0.003	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.012	0.000	0.015	0.015	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.012	0.002	0.014	0.013	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	50	48	51	3	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.03	0.02	["H2O]
Chamber Supply Air Flow:	-	-	20	20	20	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	8 hours					

NOTES: Peak Test Location 1

SECTION 6
APPENDIX

DATA FILES

TEST NAME	RAW DATA FILE
Model Half Life	3494 Halflife Ozonelog.csv
Max Ozone: Operating Mode without solution	3495 Max High without solution ozonelog.csv
Max Ozone: Night Mode without solution	3496 Max Low without solution ozonelog.csv
Max Ozone: Operating Mode with solution	3497 Max high with solution ozonelog.csv
Max Ozone: Night Mode with Solution	3498 Max Low with Solution ozonelog.csv

ATTACHMENT DOCUMENTS

DOCUMENT	SOFT-COPY FILE NAME
ARB Application	NA
Chain of Custody: Sample 1	COC_CRT1804251435-001,002.pdf
Chain of Custody: Sample 2	COC_CRT1804251435-001,002.pdf

UUT PHOTOGRAPHS



No Namplate

UUT

Nameplate

UUT PHOTOGRAPHS: PEAK TEST



Location 2

Operating Mode without solution



Location 1

Night Mode without solution



Location 1

Operating Mode with solution



Location 1

Night mode with solution

UUT PHOTOGRAPHS: MAX OZONE TESTS



Location 2

Operating Mode without solution



Location 1

Night Mode without solution



Location 1

Operating Mode with Solution



Location 1

Night Mode with solution

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