

# Elfi Elektrofiter AB

# OZONE TEST REPORT

**SCOPE OF WORK**

Ozone Emissions Testing of Household Electrostatic Air Cleaners for Model: Elfi 310

**REPORT NUMBER**

103222910CRT-001A

**ISSUE DATE**

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13

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Qu-00818587

**DOCUMENT CONTROL NUMBER**

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## TEST REPORT FOR ELFI ELEKTROFILTER AB

Report No.: 103222910CRT-001A

Date: October 23, 2017

### SECTION 1

#### SUMMARY

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

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

IEC 60335-2-65 Clause 32.101, Household and similar electrical appliances – Safety –Part 2-65: Particular requirements for air-cleaning appliances.

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 G103222910 which has been authorized by Intertek quote number: Qu-00818587. 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 above signed.

OZONE EMISSIONS SUMMARY			
FAN SPEED	FILTER(S)	O3/VOLTAGE SETTING	C(t) <sub>max</sub> [ppm]
High	YES	-	0.002
Low	YES	-	0.004
Low	NO	-	0.003

Completed by:	Joseph Hartley	Reviewed by:	Michael Hudon
Title:	Technician III	Title:	Engineering Team Lead
Signature:		Signature	
Date	10/23/2017	Date:	10/23/2017

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**CHAMBER EQUIPMENT INFORMATION**TEST EQUIPMENT LIST

Instrument	Model	Intertek Ctrl #	Cal Due Date
Teledyne – Advanced Pollution Instrumentation Ozone Calibrator	703E	O204	04-02-2018
Teledyne – Advanced Pollution Instrumentation Ozone Monitor	400E	O201	*
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**

<b>MODEL INFORMATION</b>			
Manufacturer:	Elfi Elektrofilter AB	Pre-Filter:	No
Model Number:	Elfi 310	HEPA Filter:	Yes
Production/Prototype/ Design	Production	ESP Filter:	No
Fan Speeds:	3	Carbon Filter:	No
O3/Voltage Settings:	NA	UV Light:	No
O3 Monitor:	NA	Ionizer:	Yes
Model Notes:	The model for this project, per the customer communication is the ELFI 310. The nameplate on the Model tested is identified 300 but is a representative sample of the 310.		

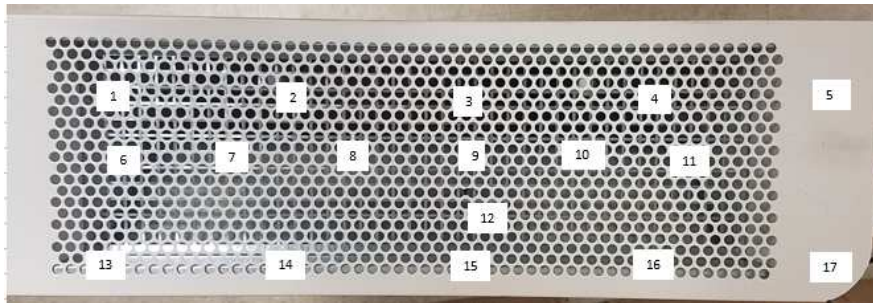
<b>RUN-IN TEST</b>			
<b>FIRST SAMPLE</b>			
Run-in Start:	1:30 PM 10/2/2017	Run-in End:	1:30 PM 10/4/2017
Run-in Temperature:	77 ± 4 degF	Tracking Number	CRT1709281020-005
Serial Number:	2017.09.05-13		
Sample Notes:			
<b>SECOND SAMPLE</b>			
Run-in Start:	NA	Run-in End:	NA
Run-in Temperature:	NA	Tracking Number	CRT1709281020-004
Serial Number	2017.09.05-14		
Sample Notes:			

**SECTION 4**

**PEAK OZONE TEST**

GRILL AND AIR PERIPHERY DIMENSIONS			
		Date of Test:	10/13/2017
Grill Height:	5.375	Air Periphery Height:	6.375
Grill Width:	15.750	Air Periphery Width:	19.875
Estimated Grill Area:	840656	Est. Air Periphery Area:	126.703
Notes:	Measurements are in Inches		

PEAK LOCATION			
Loc.	X	Y	
-	[inches]	[inches]	
1	-8.0	2.0	
2	-4.0	2.0	
3	0.0	2.0	
4	4.0	2.0	
5	8.0	2.0	
6	-5.375	0.0	
7	-3.0	0.0	
8	-0.375	0.0	
9	0.0	0.0	
10	1.875	0.0	
11	4.24	0.0	
12	6.375	0.0	
13	-8.0	-2.0	
14	-4.0	-2.0	
15	0.0	-2.0	
16	4.0	-2.0	
17	8.0	-2.0	
* Location measurements are coordinates in reference to the center point.			



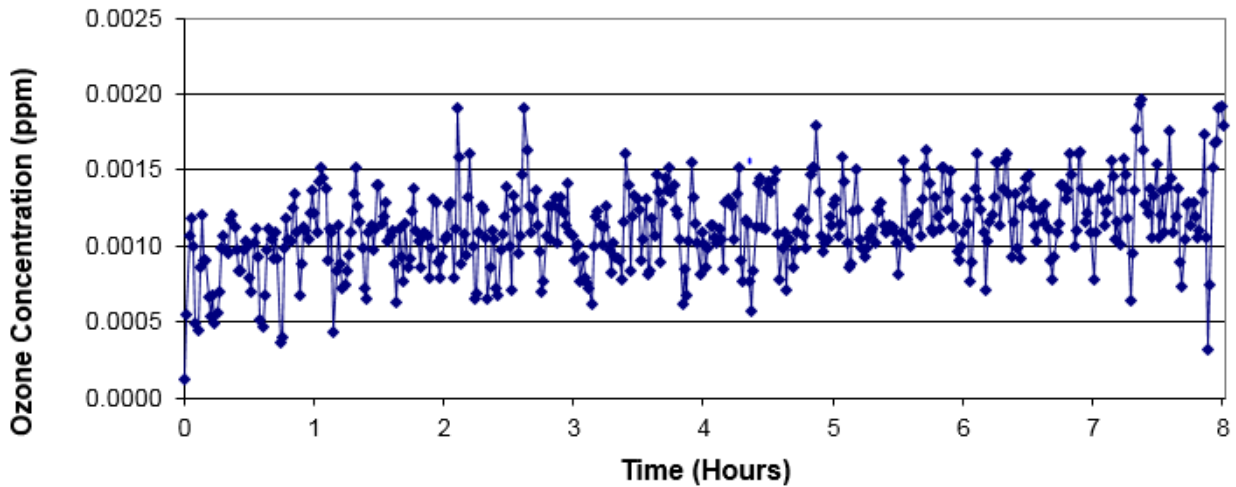
PEAK OZONE CONCENTRATIONS (ppb)				
Location	With Filter(s)		Without Filter(s)	
	Highest	Lowest	Lowest	
1	0.0000	0.0006	0.0010	
2	0.0004	0.0007	0.0011	
3	0.0002	0.0007	0.0012	
4	0.0008	0.0014	0.0011	
5	0.0006	0.0002	0.0001	
6	0.0002	0.0016	<b>0.0020</b>	
7	<b>0.0013</b>	0.0016	0.0010	
8	0.0000	0.0016	0.0014	
9	0.0006	0.0007	0.0009	
10	0.0003	0.0018	0.0015	
11	0.0006	0.0015	0.0013	
12	0.0009	0.0022	0.0006	
13	0.0006	0.0011	0.0019	
14	0.0008	0.0015	0.0006	
15	0.0009	0.0014	0.0012	
16	0.0009	<b>0.0026</b>	0.0019	
17	0.0005	0.0008	0.0001	

SECTION 5

MAX OZONE TEST

START DATE OF TEST: 10/10/2017  
 SAMPLE: First Sample  
 FAN SPEED: High  
 FILTER(S): HEPA Filter Installed

8 Hour Ozone Concentration



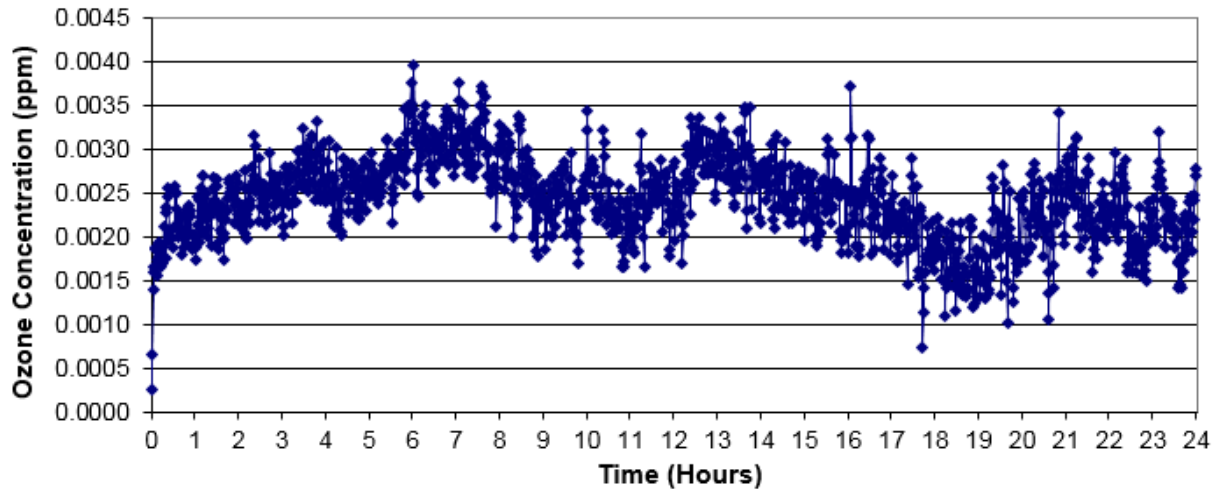
MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.001	0.001	0.001	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.001	0.000	<b>0.002</b>	0.002	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.001	0.001	0.002	0.001	[ppm]
Chamber Temperature:	40.4.2	PASS	77	76	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	47	47	48	1	[%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 7

MAX OZONE TEST

START DATE OF TEST: 10/16/2017  
 SAMPLE: First Sample  
 FAN SPEED: Low  
 FILTER(S): HEPA Filter Installed

**24 Hour Ozone Concentration**



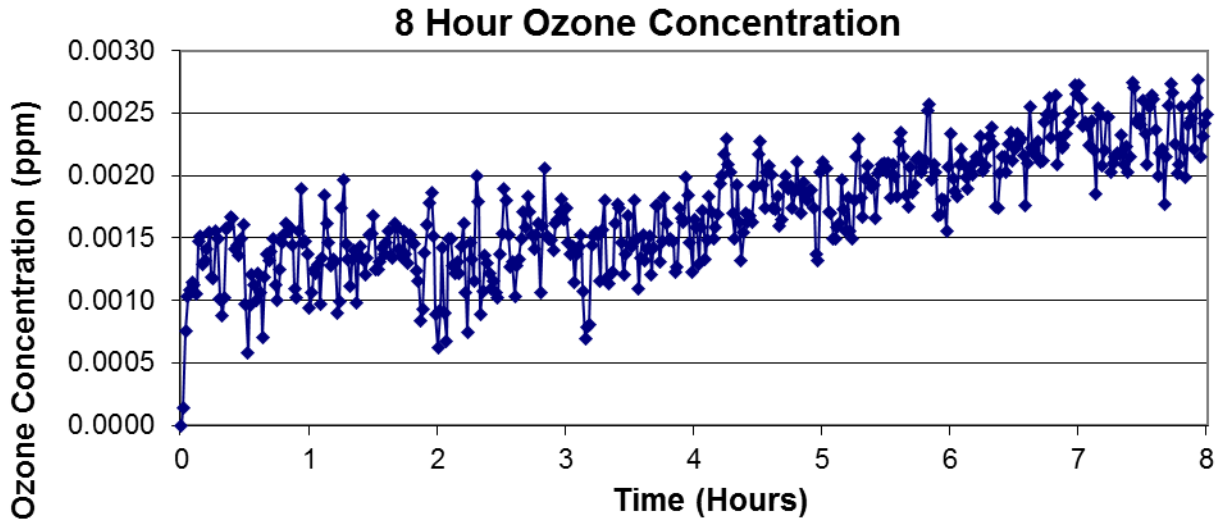
MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.001	0.000	0.002	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.002	0.000	<b>0.004</b>	0.004	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.002	0.001	0.004	0.003	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	49	48	51	3	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.03	0.02	["H2O]
Chamber Supply Air Flow:	-	-	19	19	19	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	24 hours					

NOTES: Peak Test Location 16  
 Test used for compliance with IEC 60335-2-65 Clause 32.101



MAX OZONE TEST

START DATE OF TEST: 10/17/2017  
 SAMPLE: First Sample  
 FAN SPEED: Low  
 FILTER(S): HEPA Filter Removed



MAXIMUM OZONE TEST RESULTS							
	UL Ref.	Pass/Fail	Mean	Min	Max	Delta	Units
Background C(t) O3:	40.4.3	PASS	0.000	0.000	0.001	0.001	[ppm]
Test 1min C(t) O3:	40.1.2	PASS	0.002	0.000	<b>0.003</b>	0.003	[ppm]
Test 5min C(t) O3:	40.1.2	PASS	0.002	0.000	0.003	0.003	[ppm]
Chamber Temperature:	40.4.2	PASS	77	77	77	1	[degF]
Chamber Humidity:	40.4.2	PASS	49	49	50	2	[%RH]
Chamber Static Pressure:	-	PASS	0.02	0.01	0.02	0.01	["H2O]
Chamber Supply Air Flow:	-	-	19	19	19	0	[SCFM]
Required to Test 2nd Sample:	40.1.1	NO					
Test Duration:	*40.4.6	8 hours					

NOTES: Peak Test Location 6

**SECTION 6**



**APPENDIX**

**DATA FILES**

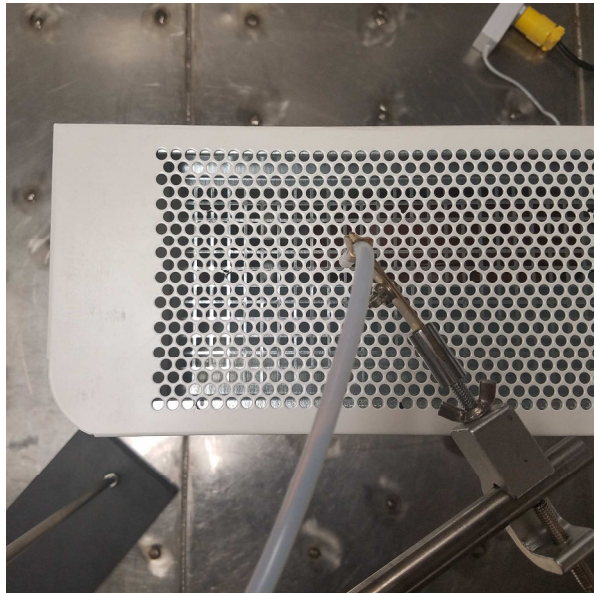
TEST NAME	RAW DATA FILE
Model Half Life	2365 Halflife.xls
Max Ozone: High Speed w/ Filter	2366 Max HIWF.xls
Max Ozone: Low Speed w/ Filter	2369 Max Low with Filter.xls
Max Ozone: Low Speed w/o Filter	2370 Max Low wo Filter.xls

**ATTACHMENT DOCUMENTS**

DOCUMENT	SOFT-COPY FILE NAME
ARB Application	NA
Chain of Custody: Sample 1	COC_CRT1709281020-005,004.pdf
Chain of Custody: Sample 2	COC_CRT1709281020-005,004.pdf

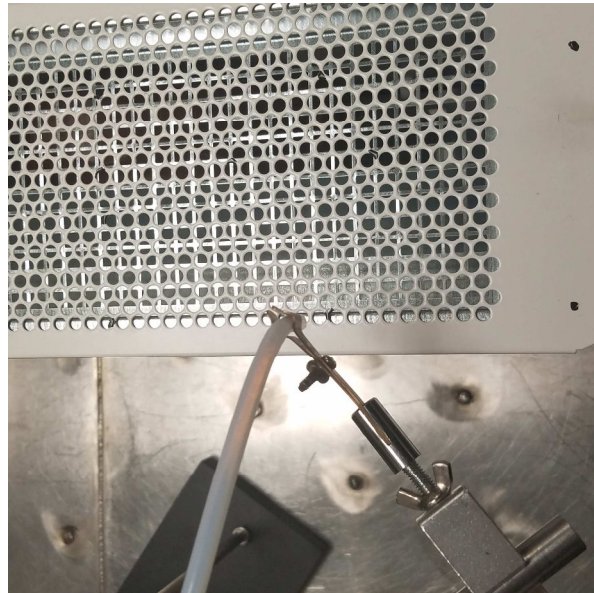
<b><u>UUT PHOTOGRAPHS</u></b>		
		<p><b>Wood's ELFI 310 SAMPLE</b></p> <p>Sample nr: 2017.10.06 - 20</p> <p>Model: ELFI 310                      Input Voltage: 12V DC                      Power Consumption Aircleaner: 4-23W                      Power Consumption Adapter: 2W</p> <p>ELFI Elektrofilter AB                      +46 322 63 30 60                      www.elfi.se</p> <p>CAUTION HIGH VOLTAGE</p> <p>Made in Sweden</p>
<b>UUT</b>	<b>Nameplate – Unit Tested</b>	<b>Nameplate - Production</b>

UUT PHOTOGRAPHS: PEAK TEST



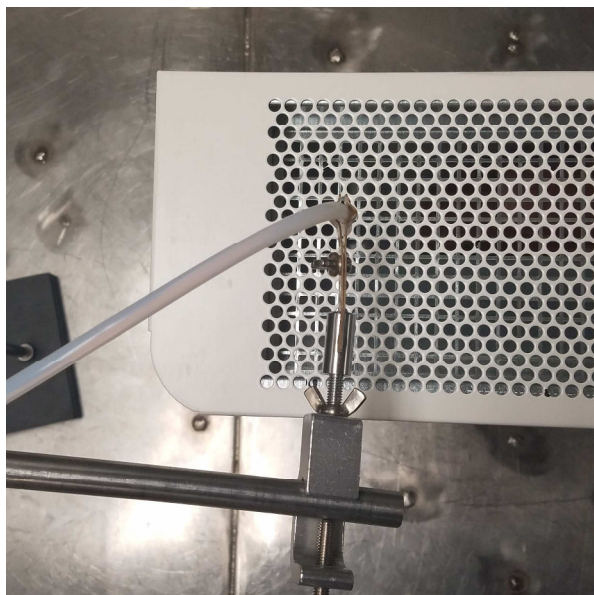
Location 7

HIGH SPEED w/ FILTER



Location 16

LOW SPEED w/ FILTER



Location 6

LOW SPEED w/o FILTER

UUT PHOTOGRAPHS: MAX OZONE TESTS



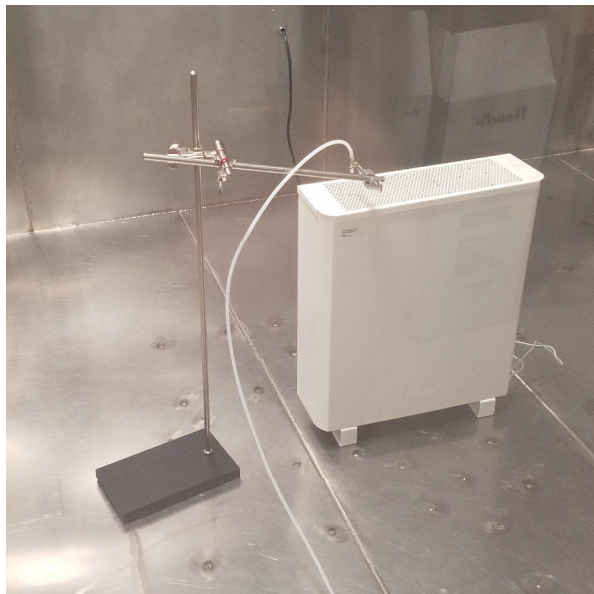
Location 7

HIGH SPEED w/ FILTER



Location 16

LOW SPEED w/ FILTER



Location 6

LOW SPEED w/o FILTER

