USC
UNIVERSITY
OF SOUTHERN
CALIFORNIA

FAX COVER SHEET

Date: July 17, 2000

Number of pages including cover sheet:7

TO: Mr. Stan Weinberg

Wein Products inc

Phone:

Fax: 2130749-6250

From: Constantinos Sioutas

USC

Civil Engineering

3620 South Vermont Avenue

Los Angeles, CA 90089

Phone: 213-740-6134

Fax: 213-744-1426

E-mail: sioutas@usc.edu

REMARKS

Dear Stan:

I ma faxing you the ozone results. I will send you a hard copy too.

Bets regards

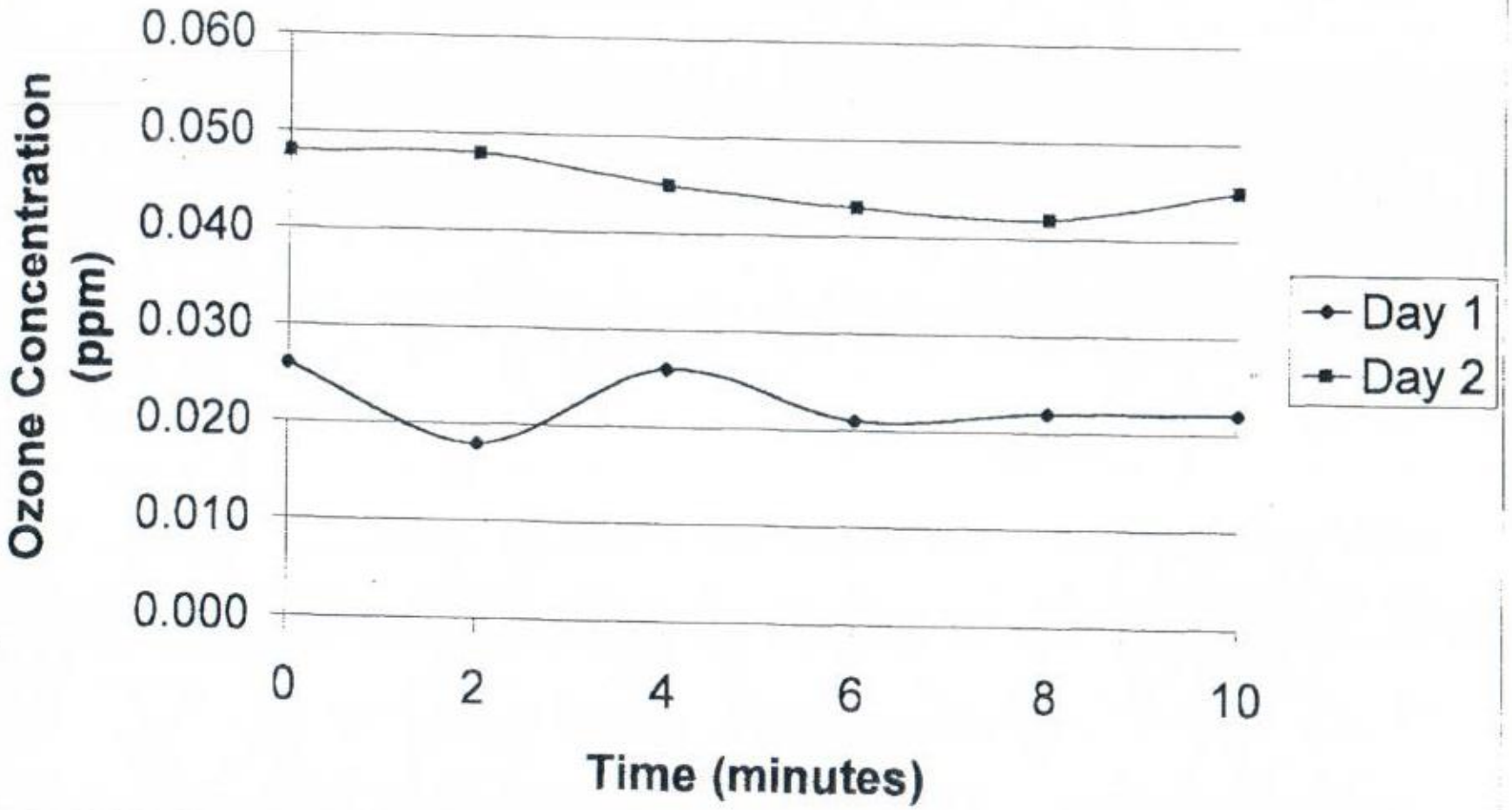
Costas

Ozone concentrations were analyzed for three AS500B and one Sharper Image personal air purifier. A Dasibi Environmental Corp. Model 1003-PC ozone analyzer was used at 3 LPM to analyze the ozone concentration both with and without the presence of a personal air purifier. The purifiers were placed two inches below the analyzers sampling line away from heat sources. The air conditioning was turned off to maintain a stable atmosphere with in the testing area (consisting of a trailer). Temperature and relative humidity were kept at room temperature and 60 % average relative humidity. A room with a relative humidity of 37% was not able to be used.

Relative humidity and temperature was kept constant by turning on the air conditioning if conditions became undesirable. The air conditioning increased room ozone to as much as 20 ppb. When desirable conditions were met, the air conditioning was turned off, and the air was allowed to equilibrate to normal standards of approximately 3 to 5 ppb within the trailer.

Sharper Images product had significantly higher ozone levels. The first barrel (near green LED) produced average ozone concentrations of near 200ppb. The other barrel produced concentrations of 100 ppb.

Figure 2: Total Ozone Levels for Wein AS500B Unit 2



Measurement Procedure Ozone concentrations

1. Air Supply is placed on subject with neck cord supplied. Subject is standing or seated.
2. Subject is told to breath normally.
3. Teflon measuring tube is positioned 6 inches from Air Supply grill but monitoring concentrations around mouth.
4. Take 12 readings over 10 minutes and average.
5. Deduct any ambient ozone concentrations.
6. Air Supply rejected if over .04 PPM.
7. Typical values are below .028 PPM

Instrument used.

- Photometric ozone analyzer
- Model 400
- Serial #476
- Manufacture is Advanced Pollution Instrumentation Inc.
- Traceability #EQOA-0992-087
- Resolution .0006 PPM or .6 PPB

Note: This manufacturer has 70% of the ozone analyzer market in the USA.

ADVANCED POLLUTION INSTRUMENTATION, INC.
6565 NANCY RIDGE DRIVE
SAN DIEGO, CA 92121-2251
PHONE: (619) 657-9800 FAX: (619)657-9816

DATE: April 23, 1997 API FAX LOG # CS-2182.dj

TO: Stan Weinberg
Wein Products
FAX# 1-213-749-~~6049~~ 6250

FROM: Clynch Varnadore PAGES: 01

CC: MT, BD, JF

Dear Stan,

I have completed testing of your unit and found the following:

Testing as you described, with the unit around my neck and the sample tube (with a funnel which has about 1.5"diameter opening attached) laying aside my nose, I found that your device (both of them) delivered between 10 and 40 PPB of O3. When I was still and breathing only through my nose, I found concentrations of up to 30 PPB. When I was moving around, (much to my surprise) the concentrations went up as high as 40 PPB. When I breathed through my mouth the concentrations went down to about 10 PPB or so.

Thanks for the opportunity to help you with this. Please don't hesitate to contact me by phone or fax if you have any questions or problems!

Best regards,

Clynch Varnadore

Ambient ozone 8PPB

Instrument used:

- Photometric ozone analyzer
- Model 400
- Serial #476
- Traceability #EQOA-0992-087
- Resolution .0006 PPM or .6PPB

Marubeni

International
Electronics
Corporation

790 Lucerne Drive
Sunnyvale, CA 94086
(408) 727-8447 Ext. 430
(408) 245-4726 (FAX)

FACSIMILE TRANSMITTAL LETTER

FAX NO.:
To: Mr. Weinberg

DATE: July 24, 1997
Company: Wein Products, Inc.

From: Tsuyako Kimura
E-mail: tsuyako@yours.com

Cc: Mr. Abe
*Page(s) including this cover sheet: (2)

SUB: Second Test Result

Dear Mr. Weinberg;

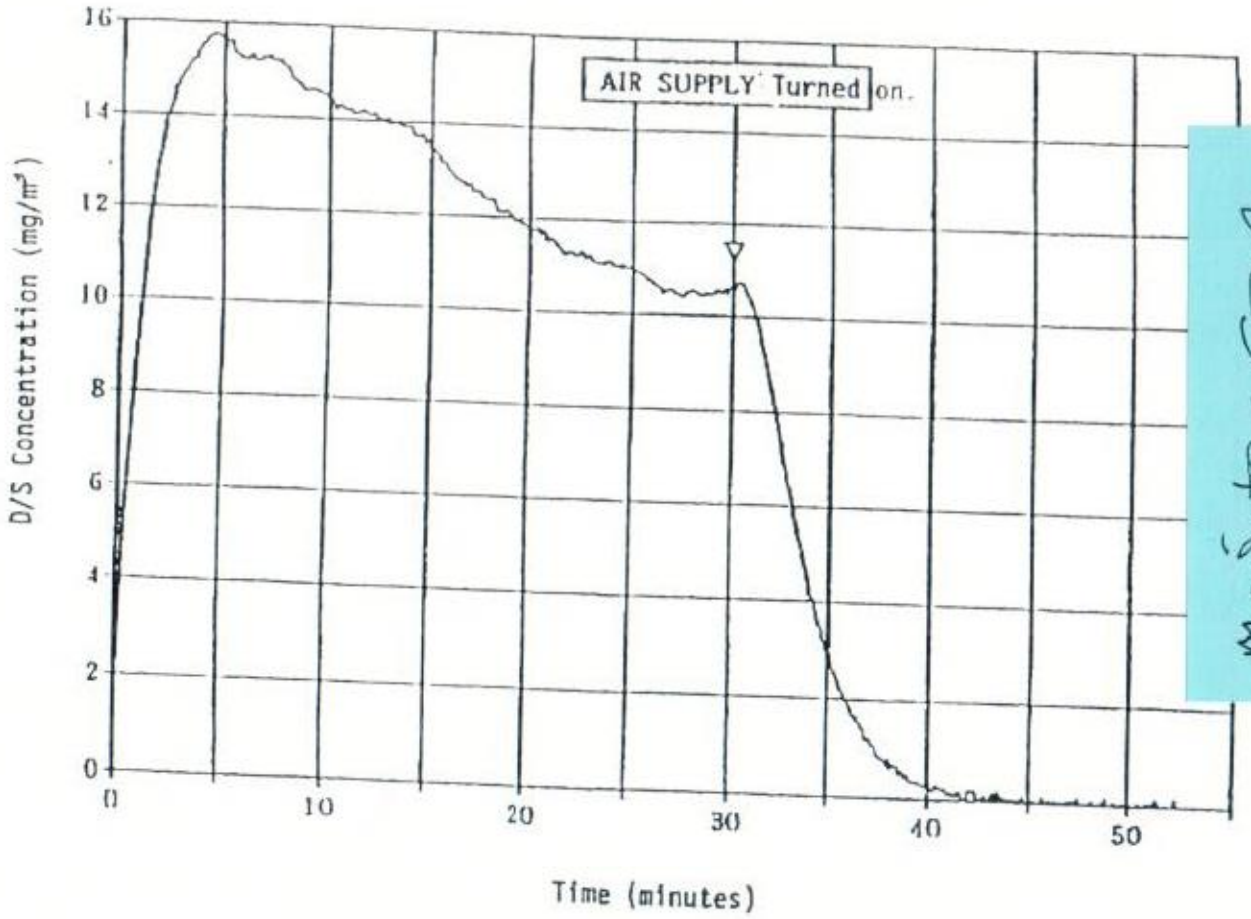
We are pleased to inform you that the second ozone concentration test produced acceptable result. The official test report will be submitted by Fuji TV Product Research Lab to Meditec Corp. by coming Monday (July 28). According to Mr. Tanaka/Meditec, the result was as follow;

Distance between Air Supply & ozone reader machine	ppm	
15 cm (vertical) x 0 cm (horizontal)	= 0.12 ppm	Not acceptable
15 cm (vertical) x 5 cm (horizontal)	= 0.03 ppm	Acceptable
15 cm (vertical) x 10 cm (horizontal)	= 0.012 ppm	Acceptable

Thus, Meditec Corporation bear the cost of the second testing, complying with the agreement.

The official test report will be forwarded to you as soon as it's translated into English.

Change in Dust/Smoke Concentration in the Acrylic Box (25 cm cube) by Time.



Meditec Corp
Japan
Ebara Co.
EG-2001
OZONE Monitor
FUJI TEST
LABS - Japan

Change in Dust/Smoke Concentration by Time					
Time (minutes)	D/S concentration (mg/m^3)	Time (minutes)	D/S concentration (mg/m^3)	Time (minutes)	D/S concentration (mg/m^3)
0	1.764	41	0.164	82	
1	9.633	42	0.149	83	
2	13.442	43	0.077	84	
3	14.928	44	0.034	85	
4	15.586	45	0.025	86	
5	15.664	46	0.022	87	
6	15.257	47	0.032	88	
7	15.281	48	0.027	89	
8	15.038	49	0.035	90	
9	14.651	50	0.015	91	
10	14.442	51	0.021	91	
11	14.211	52	0.042	93	
12	14.151	53		94	
13	14.002	54		95	
14	13.826	55		96	
15	13.518	56		97	
16	12.910	57		98	
17	12.622	58		99	
18	12.357	59		100	
19	12.048	60		101	
20	11.797	61		102	
21	11.577	62		103	
22	11.285	63		104	
23	11.168	64		105	
24	11.067	65		106	
25	10.961	66		107	
26	10.693	67		108	
27	10.514	68		109	
28	10.513	69		110	
29	10.491	70		111	
30	10.631	71		112	
31	10.163	72		113	
32	8.465	73		114	
33	6.347	74		115	
34	4.374	75		116	
35	2.946	76		117	
36	1.867	77		118	
37	1.197	78		119	
38	0.735	79		120	
39	0.449	80		121	
40	0.258	81		122	

1: **Purpose of the Test**

The below described product was tested for ozone concentration and neutralization of tobacco smoke.

The name of the product: Portable air purifier Air Supply Model AS-1500

2: **Test Procedure**

Test was conducted according to Meditec Corporation's instruction.

(1) Effectiveness on neutralization of tobacco smoke

Machine: Shibata Kagaku's Digital smoke/dust monitoring machine
Model #: P 5L2

Setting Environment: in an acryl box (25 cm x 25 cm x 25 cm)

The way to generate tobacco smoke: burn 0.05 g of tobacco in the acryl box.

After burning the tobacco in the box, Air Supply, which was set in the box, was turned on.

*The monitoring machine was connected to the small hole which was made on the box.

O_3 → (2) Ozone concentration

Space: 5.5 m x 4.3 m (high: 2.6 m)
Temperature: 25.1 °C
Humidity: 46.3 %
Monitoring Machine: Ebara Co.'s Ozone Monitor EG-2001
(Measures up to 0.001 ppm)

Measured ozone concentration by changing the horizontal position of the machine and Air Supply.

Chart 1: Ozone concentration test result

	A	B	C	D
1		Horizontal Distance		
2	Vertical Distance	0 cm	5 cm	10 cm
3	15 cm	0.124	0.033	0.012
4	10 cm	0.195		
5	5 cm	0.484		
6	0 cm	2.008		

Application Note OS-101

UL Ozone Standard 867

(for the ozone output of certain electrostatic air cleaners)

The following language is quoted from UL Standard No. 867 with respect to the ozone output of cord-powered portable electrostatic air cleaners for household use:

37 Ozone Test

37.1 A portable product for household use shall not produce a concentration of ozone exceeding 0.05 parts per million by volume when tested as described in **37.2-37.7**.

37.2 The test is to be conducted in a room having a volume of 950-1100 cubic feet (26.9-31.1 cubic meters) with a minimum side dimension of 8 feet (2.4 meters) and a maximum height dimension of 10 feet (3.0 meters) without openings. The test room walls and ceiling are to be covered with a sheet of polyethylene or aluminum. The floor is to be of a nonporous material such as vinyl tile or aluminum.

37.3 During the test, the test room is to be maintained at a temperature of 25 plus or minus 2 degrees Centigrade (77 plus or minus 4 degrees Fahrenheit) and a relative humidity of 50 percent plus or minus 5 percent. Prior to the start of and immediately after this test, the ozone background level is to be measured with the product off. The background level average shall be calculated and subtracted from the maximum measurement during the test.

37.4 The product is to be located at the center of the test room floor and about 30 inches (762 mm) above the floor for a table mount product.

37.5 The ozone monitor sampling tube is to be located 2 inches (50 mm) from the air outlet of the product and is to point directly into the air stream.

Measurement Procedure Ozone concentrations
Type B AS1500 with 9 volt battery

1. Air Supply is placed on subject with neck cord supplied. Subject is standing or seated.

2. Subject is told to breath normally.

3. Teflon measuring tube is positioned 6 inches from Air Supply grill but monitoring concentrations around mouth.

4. Take 12 readings over 10 minutes and average.

5. Deduct any ambient ozone concentrations.

6. Air Supply rejected if over .04 PPM.

7. Typical values are below .028 PPM

Instrument used.

- Photometric ozone analyzer
- Model 400
- Serial #476
- Manufacture is Advanced Pollution Instrumentation Inc.
- Traceability #EQOA-0992-087
- Resolution .0006 PPM or .6 PPB

Note: This manufacturer has 70% of the ozone analyzer market in the USA.

1.1.1 Low Voltage

www.arb.ca.gov

Underwriters Laboratories Inc.

Research Triangle Park Division
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P.O. Box 13995
Research Triangle Park, NC 27709-3995 USA
www.ul.com
tel: 1 919 549 1400
fax: 1 919 547 6000
Customer service: 1 877 854 3577

Subject 867

March 20, 2007

To: Subscribers to UL's Standards Service for Electrostatic Air Cleaners

Subscribers to UL's Listing and Recognition Services for Electrostatic Air Cleaners and Ionizers

Subject: Clarification for Ozone Testing of Electrostatic Air Cleaners and Ionizers

UL announces a clarification for repeatability and reproducibility (R&R) of ozone test requirements for Electrostatic Air Cleaners and Ionizers covered by UL 867. Attached as Appendix A is an expanded rendition of Section 37 (including new 37A) of the standard in which test criteria are more fully explained and "best practices" are identified. Note that this document is not a Standard and has not gone through the standards development process.

As currently described, the UL 867 ozone test method lacks specificity with regard to the test chamber and conditions of operation. The test R&R clarifications included herein have been developed from feedback provided by members of the Ozone Working Group of UL's Standards Technical Panel (STP) responsible for UL 867 and supporting documents.[1]

Ozone test R&R depends upon many factors, the most critical of which include: stability of temperature and humidity conditions within the defined range, uniformity of conditions within the test environment and chamber half-life.

As cited in the clarification of requirements, the chamber half life of 16 ± 1 minutes is specified based upon nominal chamber half-life calculated from variables defined within "Technical Assessment for CPSC – Part II: Ozone Devices Modeling Considerations," Shaughnessy, R; Krause, D; Ball, L. When calculating the half life using the equation $C_t = C_0 e^{-kt}$, the following assumptions were made:

- A ventilation rate of 0.35 h^{-1} is specified by the International Mechanical Code (2003), and the International Residential Code (2003) as the minimum that should be provided by windows or mechanical means within a home. This therefore is the maximum air exchange rate allowed within the test chamber.
- A deposition velocity of 1.76 ± 0.612 m/h was calculated from a study of 43 homes by Lee et al (1999). A rate of 1.15 m/h (1.76 – 0.612 m/h) was therefore chosen as the appropriate deposition velocity.
- The nominal chamber surface area to volume ratio is 2.

---

[1] *BS EN ISO 16000-9:2006 - Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method*
ECMA-328 – Determination of Chemical Emission Rates from Electronic Equipment
Blauer Engel's Basic Criteria for the Award of the Environmental Label for Printers RAL-UZ 85 – Test Method for the Determination of Emissions of Hardcopy Devices

Underwriters Laboratories Inc.

Research Triangle Park Division

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ECMA-328 – Determination of Chemical Emission Rates from Electronic Equipment

Blauer Engel's Basic Criteria for the Award of the Environmental Label for Printers RAL-UZ 85 – Test Method for the Determination of Emissions of Hardcopy Devices

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September 25, 2003

Ms. Stan Weinberg
Wein Products
115 West 25th St.
Los Angeles, CA 90007

Phone: (213) 749-6049
Fax: (213) 749-6250

Project No. 3049001-108
Report No. 3049001-001

Subject: Ozone off-gas test of your Ionic Air Purifier, Model AS150MM

Dear Mr. Weinberg;

We have completed our testing of the above referenced equipment and this letter will serve as our report. The unit was tested in accordance with the section 32.1 of the standard for Safety of Household and Similar Electrical Appliances Part 2-65: Particular Requirements for Air-Cleaning Appliances (IEC 60335-2-65, 1st ed. 06/01/93). Per your instruction and the requirements of the standard, the unit was tested in the center of the room. The ambient room ozone was measured at 0.023 ppm and after 24 hours of continuous operation, the ozone measured was 0.055 ppm. Per the requirements of the standard, the ambient measured ozone is to be subtracted from the largest measurement during the 24 hours. The unit tested generated a maximum of 0.032 ppm.

We are happy to inform you that the equipment does comply with the requirements of section 32.1, which requires that it shall not exceed the limit of 0.05 ppm.

This letter completes the evaluation phase of the original work anticipated by our Project No. 3049001-108. Please review our comments and send a letter describing the method of correcting each item listed above to our office. In order for our office to complete your Project, a copy of this letter, along with the aforementioned letter and any other information that would be pertinent, should be provided. All correspondence should be addressed to Sherry Tello, Customer Operations Specialist. If there are any other questions or issues, please feel free to contact this office.

Tested By:
David N. Woodcock
Daniel N. Woodcock
Engineering Manager

Approved By:
Jim Cheng
Jim Cheng
Engineering Team Leader

Intertek ETL SEMKO

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DATA SHEETS

Company:	Wein Products	Project Engineer:	Daniel N. Woodcock
Product:	Portable Ionic Air Purifier	Tested By:	Daniel N. Woodcock
Models No.:	AS150MM	Sample Condition:	Production Line
Sample Cond.	Production		
Standard:	IEC 60335-2-65 (06-01-1993)		

TEST PERFORMED	Section	PASS	FAIL
Ozone Test	32.1	✔	

Tested By: **Daniel N. Woodcock** Initials:

Reviewed By: Jim Abernathy Initials:

DATA SHEETS

Company:	Wein Products	Project Engineer:	Daniel N. Woodcock
Product:	Portable Ionic Air Purifier	Tested By:	Daniel N. Woodcock
Models No.:	AS150MM	Sample Condition:	Production Line
Sample Cond.	Production		
Standard:	IEC 60335-2-65 (06-01-1993)		

TEST EQUIPMENT LIST

Item	Equipment Type	Make	Model No.	Serial No.	Cal. Date
1	Ozone Meter	API	450	117	2/28/03
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

DATA SHEETS

Company:	Wein Products	Project Engineer:	Daniel N. Woodcock
Product:	Portable Ionic Air Purifier	Tested By:	Daniel N. Woodcock
Models No.:	AS150MM	Sample Condition:	Production Line
Sample Cond.	Production		
Standard:	IEC 60335-2-65 (06-01-1993)		

Ozone (Section 32.1):

Method

The test shall be performed while in a room without openings, having dimensions of 2.5m x 3.5m x 3.0m, the walls being covered with polyethylene sheet. The appliance is positioned in accordance with the instructions. Appliances used on a table are placed in the center of the room approximately 750 mm above the floor.

The room is maintained at approximately 25°C and 50% relative humidity. The appliance is supplied at rated voltage for 24 h, removable filters being removed if this is more unfavorable.

The ozone sampling tube is located in the air stream 50 mm from the air outlet of the appliance. The background ozone concentration measured prior to the test is subtracted from the maximum concentration measured during the test.

The concentration of ozone shall not exceed 0.05 ppm.

Results:

The equipment was tested in a room approximately 8 by 12 by 10 feet (2.4 by 3.7 by 3.0 m). The dimensions were determined to not be significant enough to impact the results of the test. Also, the sample was placed 4ft (1.2 m) above ground level (roughly center to the overall room).

The test was allowed to continue for 24 hours.

0.023	Ambient
0.055	After 24 Hours
0.032	Calculated Ozone

The equipment does not exceed the maximum allowed value of 0.05 ppm.

TESTED BY:		REVIEWED BY:	
		DATE PERFORMED:	9/24/03 - 9/25/03
		PASS X	FAIL

EQUIPMENT USED (1) 2 3 4 5 6 7 8 9 10 11 12 13 14 15 or N/A

Underwriters Laboratories Inc.®

1655 Scott Boulevard
Santa Clara, California 95050-4169
(408) 985-2400
FAX No. (408) 296-3256
Cable ULINC SANTA CLARA, CA

E81456, 99SC43870 April 23, 1999

Wein Products Inc
Los Angeles, CA

Fax No: 1-213-749-6250

Attention: Stanely Weinberg

Subject: Preliminary investigation - ozone test per UL867, Sec. 37, for air cleaner Model AS1500B.

Dear Mr. Weinberg:

We have completed the subject test and found the sample tested to be in compliance with Section 37 (Ozone test) of UL867. The maximum ozone concentration noted during the first 24 hours was 0.026 ppm. A UL Listed direct plug-in power supply with 12V dc output was used to power the sample tested. The scope of this project is for the ozone test for your reference purposes only.

This fax completes all work anticipated under this project and we are closing this project. We are instructing our Accounting Department to invoice you for the charges accrued under this project. We are keeping the sample here for reference

Regards,

Gary Liu (Ext. 32015)
Senior Project Engineer
Engineering Services
Section 3016G
Email: liug@ul.com

Reviewed by:

Anil N. Patel (Ext. 32610)
Associate Managing Engineer
Engineering Services
Section 3016G
Email: patelani@ul.com