Summary

13-Week GLP Toxicity Study of the Boss Hydroxyl Odor Processor ® Air Cleansing Machine in Rats

Study Number: CB10-5065-R-TX

Testing Facility:

Comparative Biosciences, Inc.
786 Lucerne Drive
Sunnyvale, CA 94085

Sponsor:

HGI Industries Inc.
2055 High Ridge Road
Boynton Beach, FL 33426

Test Article:

Boss Hydroxyl Odor Processor ® air cleansing machine

KEY STUDY PERSONNEL AND DATES

13-Week GLP Toxicity Study of the Boss Hydroxyl Odor Processor ® Air Cleansing Machine in Rats

Study Number: CB10-5065-R-TX

Key Study Personnel:

Study Director:	Robin Dean, PhD
Lead Biologist	Lucy Jawed, BS, BA
Attending Veterinarian:	Carolyn Reed, VMD, DACLAM
Clinical Pathology:	Joan Shewmaker, CLS, MT (ASCP) Quality Veterinary Laboratories (QVL)
Ophthalmologist:	Kristina Burling, DVM, Diplomate, ACVO Animal Eye Specialists of San Jose
Study Pathologist:	Carol Meschter, PhD, DVM, DACVP
Scientific Writer:	Peter Margolis, PhD
Quality Assurance:	Jeanette Jacobs, BS (to 10 June 2011) Matthew Knox, BA (from 10 June 2011)
Boss XL3 Hydroxyl Odor Processor Performance Monitoring	Mark Mino General Manager, HGI Industries, Inc,

Study Dates:

Study Initiation:	1 March 2011
Initiation of Treatment:	2 – 4 March 2011 (Cohorts 1 – 3)
Terminal Bleed and Necropsy:	1 – 3 June 2011 (Cohorts 1 – 3)
End of In-life:	3 June 2011
Report Issued:	January 12, 2012

Sponsor and Sponsor's Representative:

HGI Industries, Inc.
2055 High Ridge Road
Boynton Beach, FL 33426

Sponsor's Representative:	Connie Araps, PhD (561) 498-4986 caraps@bellsouth.net

1. INTRODUCTION

The objective of this study was to evaluate the potential toxicity in rats exposed to hydroxyl radicals and other compounds that may be released into the air as a result of operation of the Boss Hydroxyl Odor Processor ® air cleansing machines. This study was conducted at Comparative Biosciences, Inc. (CBI; Sunnyvale, CA). The study was conducted in compliance with the US Food and Drug Administration's Good Laboratory Practices regulations (21 CFR Part 58), with this protocol as amended, and with Testing Facility Standard Operating Procedures. (Note: The air exchange rate in the room with the HGI machine was decreased slightly below the lower end of the NIH - recommended range.) The study was initiated on 1 March 2011. Treatment was initiated on 2 – 4 March 2011 (for Cohorts 1 – 3, respectively); terminal bleeds and necropsies were performed on 1 – 3 June 2011, respectively. The in-life phase was completed on 3 June 2011; this report is issued on January 12, 2012..

2. EXPERIMENTAL DESIGN

The study consisted of two groups of Sprague-Dawley rats: a treated group (20 males and 20 females) housed for 13 weeks in a room in which two Boss Hydroxyl Odor Processor® air-cleansing machines were operating continuously; and a control group (10 males and 10 females) housed for the same time period in a different room, under similar housing conditions, but not exposed to Boss Hydroxyl Odor Processor® machine operation. Both groups underwent the same evaluations and tests, including the following: Clinical observations were recorded once daily, with special attention to the eyes, nose, and respiratory system. Body weights and food consumption were measured once weekly. Functional observational battery (FOB) tests were conducted four times during the course of the study, including a pre-treatment test and three other times at regular intervals following the start of treatment. The FOBs included a focus on respiration, eyes, neurotoxicity, and mucous membranes. Ophthalmological examinations were performed on all animals by a veterinary ophthalmologist once prior to the start of treatment and again prior to sacrifice. Prior to necropsy, blood was collected for hematology and clinical chemistry analysis. At sacrifice, gross necropsies were performed, including specified organ weights. A complete set of tissues was evaluated histopathologically by a board-certified veterinary pathologist, with special attention to the skin, eyes, nasal turbinates, larynx/pharynx, and respiratory system.

Table 1. Summary of Study Design

Group	Animal No. (males/females)	Treatment	Sacrifice
1	101-110/151-160	Room without Boss Hydroxyl Odor Processor® Machines (similar housing conditions)	Week 13
2	201-220/251-270	Room with Boss Hydroxyl Odor Processor® Machines running continuously	Week 13

3. MATERIALS AND METHODS

3.1. Test and Control Articles

3.1.1. Test Article

The test article, the Boss Hydroxyl Odor Processor® air-cleansing machine, produces airborne hydroxyl ions/radicals and other compounds (combined oxides) by photolysis of ambient water vapor in the air. These products are designed to cleanse the air and exposed surfaces by reacting with and decomposing organic compounds, bacteria, viruses, mold, and mildew. The equipment was received in good condition at the Testing Facility on the indicated dates.

Table 2. Test Articles/Machines

Item	Serial No.	Logged Usage on Receipt	Date of Receipt	Logged Usage on Return
Boss Hydroxyl Odor Processor	ODHG001293	1.4 hr	14 Feb 2011	2655.2 hr
Boss Hydroxyl Odor Processor	ODHG001295	148.7 hr	14 Feb 2011	2812.3 hr
Back-up	ODHG001266	44.5 hr	14 Feb 2011	44.6 hr
Back-up	ODHG001294	286.7 hr	14 Feb 2011	286.8 hr
Odorox control box with blue modem cable "W3"	n/a	n/a	27 Jan 2011	n/a

Two Boss Hydroxyl Odor Processor® machines were set up on either end of an animal room on the fixed side of the door at either side of the room. The rack of rat cages with two rats per cage was placed in the middle of the room. The air intake for the monitoring machine was taped in place in the middle of the cage rack to sample the level of hydroxyl ions and other active agents being released by the Boss Hydroxyl Odor Processor ® machines. The position of the machines and the rack was specified by the sponsor and marked on the floor to maintain the same positions throughout the study. The Boss Hydroxyl Odor Processor ® machines were adjusted

and set up prior to start of study by Jeff Chalpan, an HGI employee. The back-up machines were not used.

3.1.2. Control Article

There was no formal control article. Control animals (Group 1) were housed in a room similar to the room with the test article, maintained at approximately the same temperature, humidity and air exchange rate as the room in which the test article was operating. Air exchange rates were 10.8 changes/hr in the control room and 7.4 changes/hr in the room with the test article. This small difference was not expected to have any effect on the outcome of the study. Air supplied to both rooms was 100% fresh outdoor air

3.2. Device Preparation/Operation

The test articles were installed and operated according to the Sponsor's instructions. An electronic monitoring unit was also installed to monitor the hydroxyl concentration during the study by sampling the air through a plastic sampling tube taped in place in the middle of the rack that housed the animals in the Boss Hydroxyl Odor Processor* room. The Boss Hydroxyl Odor Processor* machines were adjusted to the desired hydroxyl output and fan level by Jeff Chalpan (from HGI) prior to start of the study. Systems were run at low fan speed and the high optics setting. During the study, the operation of the Boss Hydroxyl Odor Processor®aAir cleansing machines was monitored continuously and remotely by the Sponsor via an Ethernet data line connected to the stand-alone monitoring device. This monitoring provided concurrent verification of the output of the machines. The real-time monitoring was used to demonstrate stable operation (including hydroxyl ion/radical and combined oxide output) over the length of the study. The monitoring report, provided by the Sponsor, is attached to this study report as Appendix C entitled HGI Report - Odorox® Boss™ Hydroxyl Processor Air Cleansing Machine Operation During Comparative Biosciences Toxicology Study CB10-5065-R-TX

3.3. Test System

Thirty-six male (160 – 180 g each) and 36 female (140 – 160 g each) Sprague-Dawley rats (*Rattus norvegicus*), 6 – 7 weeks old on arrival, were purchased from Simonsen Laboratories (Gilroy, CA) for use in the study. Rats were selected for the study since these animals are an accepted species frequently used in pre-clinical evaluation of devices intended for human use.

3.3.1. Institutional Animal Care and Use Committee Approval

A research proposal was approved by the Institutional Animal Care and Use Committee of CBI for this study.

3.3.2. Receipt and Acclimation

All 72 rats were received at the Testing Facility on 18 February 2011. Animals were received in good condition. Animals were acclimated for 9 days following arrival. During the acclimation period, the animals were observed at least once daily for clinical signs of abnormality. No signs were observed. On 28 February 2011, the animals were examined by Carol Meschter, PhD, DVM, DACVP. Oral malocclusion was observed in three of the animals; the remaining rats were judged to be in good health and were released for use in the study.

3.3.3. Identification

Animals were arbitrarily assigned sequential temporary identification numbers after receipt at the Testing Facility. The study number and the temporary identification number were displayed on each cage card during the acclimation period. Upon assignment to a study group, animals were assigned "permanent" identification numbers, which were displayed on cage cards and coded on individual animals by tail marks using permanent ink.

3.3.4. Environment and Husbandry

3.3.4.1. Temperature and Relative Humidity

Controls were set to maintain the temperature of the animal rooms at 64° to 79°F and the relative humidity (RH) was generally between 30% to 70%. These environmental parameters were monitored and recorded daily. There were no excursions from the expected temperature range during the acclimation or treatment phases. Following the start of treatment (via test article machine exposure; see Sections 3.1. and 3.2.), the RH fell as low as 22% in the room housing the experimental animals (Group 2) on 21 separate days. In the room housing the control animals (Group 1), RH fell as low as 17% on 28 separate days. While these occasions represented excursions from the 30-70% RH range, these events were not thought to significantly affect the study

The air exchange rate in the study rooms was adjusted down slightly from the NIH-recommended level of 10 -15 air changes per hour because of concern that a high air exchange rate would remove the air modified by the Boss Hydroxyl Odor Processor® Air cleansing machines (hydroxyl ions and other oxides) from the room too rapidly to allow sufficient exposure of the rats. At start of study, the air exchange rate in the Group-2 room was 7.4 changes/hr and in the control room it was 10.8 changes/hr. Rooms were left at this setting for the duration of the study.

3.3.4.2. Light Cycle

Twelve hours of light (fluorescent light) and twelve hours of dark were provided in the animal rooms. Lights were turned on at approximately 0700 hours and turned off at approximately 1900 hours each day.

3.3.4.3. Feed

LabDiet® 5002 Certified Rodent Diet (Purina Mills, Inc., St. Louis, MO) was fed *ad libitum* throughout the acclimation and treatment periods. Records of lot number(s) and Certificate(s) of Analysis are maintained by the Testing Facility. There are no known contaminants that are reasonably expected to be present in the diet that are known to be capable of interfering with the purpose or conduct of the study.

3.3.4.4. Water

Fresh water from Sunnyvale Municipal Water Supply was provided *ad libitum* to the animals via individual bottles. The water supply is periodically monitored by the City of Sunnyvale and by the Testing Facility for chlorine content and bacterial contamination. Results of these analyses are maintained on file at the Testing Facility. There are no known contaminants that are reasonably expected to be present in the water that are known to be capable of interfering with the purpose or conduct of the study.

3.3.4.5. Husbandry

Throughout the study, animals were pair-housed in plastic "shoe-box" static cages with wire tops in rooms dedicated to rats. General procedures for animal housing and husbandry were conducted according to Testing Facility SOPs and met all regulations concerning use of animals in research including the US Department of Agriculture regulations (9 CFR Ch.1) implementing the Animal Welfare Act (7 USC 2131 *et seq.*) and the recommendations of the National Research Council's *Guide for Care and Use of Laboratory Animals* (National Academy Press, 1996).

3.3.4.6. Sanitation

All animal enclosures and equipment were cleaned and sanitized according to Testing Facility SOP.

3.3.5. Final Selection and Group Assignment

On 28 February 2011 (study Day -2, -3, or -4, depending on cohort), all animals were weighed, subjected to veterinary check (see Section 3.3.2.), and assessed by FOB (see Section 3.9.). On the following day (1 March 2011), animals were subjected to ophthalmological examination (see

Section 3.8.), and a total of sixty animals (30 males, 30 females) were selected for use in the study. Animals were selected based on moderate body weight and normal clinical, behavioral, and ophthalmological presentation. Two males and one female were excluded at the veterinary check, two males were excluded for ophthalmological reasons, and two males and one female were excluded for possible behavioral (FOB) abnormalities. Animals that were approved to be on study were randomized using an Excel function and assigned to the two study groups.

3.4. Treatment

3.4.1. Dose Administration

Formally speaking, there was no dose administration, but animals were maintained in rooms lacking (Group 1) or containing (Group 2) operating test article devices (Boss Hydroxyl Odor Processor® air cleansing machines) from the start of the treatment phase to the end of in-life.

3.4.2. Treatment Cohorts

To facilitate assays and necropsies, animals were entered into the treatment phase as three separate cohorts at one day intervals, starting on 2 - 4 March 2011 for Cohorts 1 -3, respectively. Cohorts were composed as follows: Cohort 1, Rats 201 - 210 and 251 – 260; Cohort 2, Rats 211 – 220 and 261 – 270; Cohort 3, all animals of Group 1 (Rats 101 – 110 and 151 – 160).

Note that, because of cohort assignment, data collected on a single calendar date actually may correspond to one of three sequential study days, depending on the respective cohort. For clarity in data analysis and presentation, data for a single calendar date are pooled and presented (e.g., plotted) as for the animals of Cohort 2 (i.e., actual study day may be ± 1 day from that shown).

3.5. Clinical Observations

Clinical observations, including overt signs of toxic or pharmacologic effect(s), were conducted at least once daily for each animal during the acclimation and treatment periods. All abnormal clinical signs were recorded. Some clinical observations (primarily for control animals) were lost from the study binder (See Deviation number 3)

3.6. Body Weights

The animals were weighed within two days prior to start of treatment, once weekly thereafter, and at sacrifice. Due to error in the carcass weight measurement of one cohort at necropsy, the carcass weights were not used in body weight analysis. There were weekly body weights before the start of the study and weekly for 13 weeks during treatment. These weights were used for analysis and

statistical comparisons. The final week-13 body weight (Day 88) was used in the normalization of organ weights to body weights. (see Deviation No. 2).

3.7. Food Consumption

Food consumption (FC) was measured once weekly beginning at the start of treatment. FC was calculated as grams (g) per animal per day for each interval. Data were expressed as a mean for the pair-housed animals.

3.8. Ophthalmology

All animals received an ophthalmological examination by a board-certified veterinary ophthalmologist during the acclimation period (within three days prior to the start of treatment) and again within three days prior to sacrifice. Two males were excluded from inclusion into the study based on the pre-treatment ophthalmological examination.

3.9. Functional Observational Battery (FOB) Behavioral Testing

Functional observation battery (FOB) testing was performed on all animals four times during the 13-week study. The first test occurred within two days prior to start of treatment; the remaining tests were performed at approximately regular intervals throughout the treatment phase. The individual tests that comprise the FOB test were described in an appendix to the protocol (see Appendix A of this report). Two males and one female were excluded from use in the study based on possible abnormal behavior in the pre-treatment FOB assessment.

3.10.Clinical Pathology

Immediately prior to sacrifice, terminal cardiocentesis was performed on each animal according to Testing Facility SOP. The resulting whole blood and serum samples were submitted to Qaulity Veterinary Laboratories (QVL, Davis, CA) for assessment of hematology and clinical chemistry parameters. The parameters to be evaluated were presented as an appendix to the protocol (see Appendix A of this report).

3.11.Necropsy

The animals were euthanized on the respective Study Day 91, according to Testing Facility SOP. Specified organs were weighed, and tissues were collected for histopathological evaluation (Appendix B). The specified organs and tissues were listed as an appendix to the protocol (see Appendix A of this report). Tissues were fixed in 10% neutral buffered formalin, NBF, (except eyes and testes, which were fixed in modified Davidson's solution for approximately 24 hours, then transferred to 10% NBF).

3.12.Histopathology

Fixed tissues were dehydrated, embedded in paraffin, sectioned at 3- to 5-µm thicknesses, and stained with hematoxylin and eosin. Tissue slides were evaluated histopathologically via light microscopy by a board-certified veterinary pathologist.

3.13.Statistical Analysis

Calculations and descriptive statistics (means, standard deviations) were performed using Excel® (Office 2007; Microsoft, Redmond, WA). Where appropriate, inferential statistical analysis was performed using Excel® or Prism 5 (GraphPad; San Diego, CA). Continuous normal data were analyzed using the Student t-test (with Welch's correction in case of non-homogeneous variance as determined by an F-test). Categorical (non-continuous) data (e.g., FOB scores, histopathology severity scores) were analyzed using non-parametric tests. P values of ≤0.05 were considered statistically significant. Summary tables, graphic displays, and other appropriate techniques were employed as deemed necessary. Clinical observation data are presented as text or in tabular form.

3.14.Storage Locations

The following records, together with any other records deemed necessary by the Study Director and study monitor(s), were retained at the Testing Facility in accordance with 21 CFR Part 58.195:

Personnel records, approved and dated study protocol and associated documentation, test/control article records, pretest animal records, in-life animal records, feed and water analysis documentation, post-mortem animal records, and relevant formal correspondence with the Sponsor.

Following completion of the study treatment phase, all equipment was returned to the Sponsor by a shipment leaving the Testing Facility on 15 June 2011. The fate of the remaining biological samples (including histology specimens) will be determined per agreement with or consultation with the **Spon**sor. Original raw data, or exact copies, will be stored at the Testing Facility for at least ten

SUMMARY OF RESULTS

Summary of In-Life Study Results:

No mortality or unscheduled deaths occurred during the study. No abnormal clinical observations were seen in animals exposed to the operation of the Boss Hydroxyl Odor Processor ® machines. Rough coat, a mild form of piloerection, was the only clinical observation that may have been related to treatment. It was also noted that treated animals appeared to be more alert during the day-light hours than untreated animals after about a week or two of treatment. No changes in food consumption or weight gain were noted. There were no treatment-related changes in ophthalmology, neurological or behavioral changes as evaluated by the functional observational battery tests. Some statistically significant differences were found in some hematological and clinical chemistry parameters, which were not considered to have toxicological significance. Males exposed to the test article exhibited a decrease in pituitary weight and an increase in testes/epididymis weight. Histological evaluation found no evidence of abnormalities in the pituitary or testes/eididymides. Thus, during the 13 week in-life phase of the study, operation of the Boss Hydroxyl Odor Processor ® machines appeared to be well tolerated by the animals under the conditions used in this study.

Summary of Pathology Results:

In general, there were no histopathologic differences between the control rats and the rats exposed to Boss Hydroxyl Odor Processor® machines. Special attention was paid to the skin, eyes, nasal turbinates, larynx/pharynx, and respiratory system. There were no changes in these organs and they appeared to be within normal limits in both the control and treated animals. There were, however, a number of neoplasms. There was a hepatobiliary carcinoma in one control male and a renal carcinoma, a hemagiosarcoma and a thymic epithelioma each in one female in the Boss Hydroxyl Odor Processor®-exposed group. The incidences were 1/20 and 3/40, which is statistically indistinguishable. This suggests that the tumors were spontaneously occurring and not related to exposure to air processed by the Boss Hydroxyl Odor Processor® Air Cleansing Machine.

Study Toxicology Summary:

The in-life phase of the study failed to reveal any significant changes in: observable behavior or health, appetite or weight gain, ophthalmology, neurological measures or other behaviors (as measured by FOB test), or biologically relevant changes in hematology or clinical chemistry. In males, small testes are not an uncommon finding in some rats. The significant pituitary weight differences between the two groups in males probably are within the normal range of variability and are not considered biologically significant. No histopathological differences were found between the control rats and those that were housed in a room with two Boss Hydroxyl Odor Processor® Air Cleansing Machines running continuously for 13 weeks. There were some tumors found in both the treated and control rats at roughly the same frequency of occurrence. The tumors were thought to arise spontaneously or be idiosyncratic in etiology, and

therefore, not thought to be related to exposure to air processed by the Boss Hydroxyl Odor Processor® Air Cleansing Machines. Thus, the results of this study indicate that the Boss Hydroxyl Odor Processor® Air Cleansing Machine was well tolerated by SD rats and did not induce any detectable toxicity under the conditions used in this experiment.

Appendix C

HGI Report - Odorox® Boss™ Hydroxyl Processor Air Cleansing Machine Operation During Comparative Biosciences Toxicology Study CB10-5065-R-TX

January 7, 2012

Section 1 - Purpose:

The purpose of the studies described herein was to measure the concentrations of hydroxyl radicals and ozone produced by the two Odorox® Boss™ Hydroxyl Processor Air Cleansing Machines used in toxicology study CB10-5065-R-TX and to confirm that the machines were operating according to their specifications.

Section 2 - Introduction:

The Odorox® Boss™ Hydroxyl Processor Air Cleansing Machines are used in indoor environments to cleanse the air of volatile organic compounds that produce odors and to kill bacteria, viruses, mold and mildew. They do this by circulating ambient air through a photolysis chamber where quartz optics generate a range of ultra violet (UV) radiation that interacts with the water vapor, oxygen and trace gases present in ambient air to produce hydroxyl radicals and ozone. These oxidants react with the volatile organic compounds in ambient air to decompose them through a series of oxidation steps which create oxidized organic by-products. The purpose of the toxicology study is to determine if the chemicals and by-products produced by the test article have adverse health effects.

Section 3 - Participants:

Laboratory studies to measure the primary chemical oxidants – hydroxyl radicals and ozone - produced by the Odorox® Boss™ Hydroxyl Processor air cleansing machines were conducted at the Lovelace Respiratory Research Institute (LRRI) by Dr. Jacob MacDonald and his team. The data produced was analyzed and reported by both Dr. MacDonald and an independent expert in the field of atmospheric physical chemistry and hydroxyl radical formation and reaction, Dr. David Crosley and Dr. Connie Araps a chemist with expertise in organic free radical chemistry. Mr. Mark Mino and Mr. Jeff Chalpan, HGI employees, provided expertise in the areas of equipment engineering, data acquisition and analysis for the purpose of validating machine performance during the toxicology studies.

Section 4 – Study Design

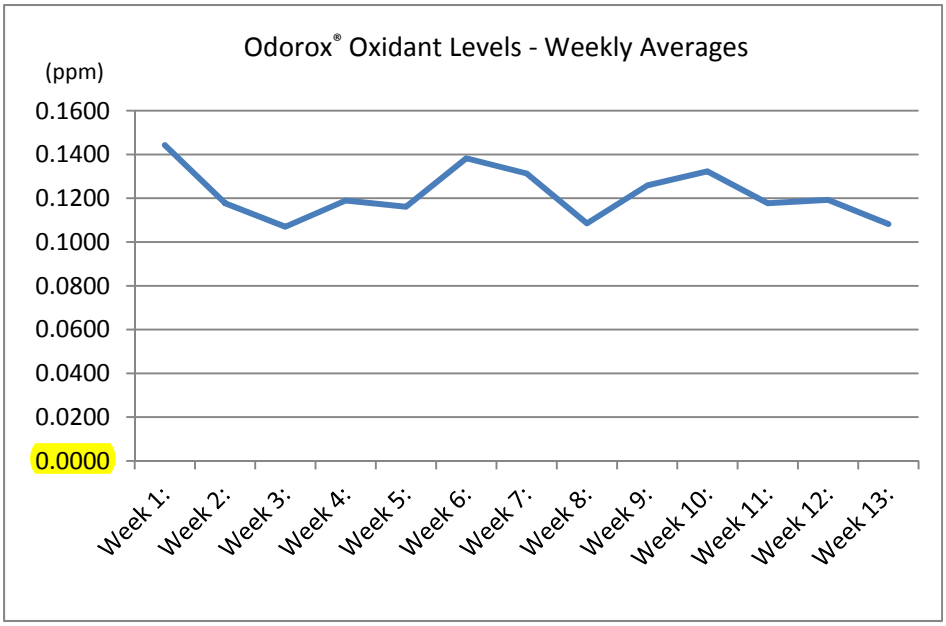
In order to measure the Odorox® Boss™ Hydroxyl Processor Air Cleansing Machines' hydroxyl radical and ozone output an ultra-clean room and special analytical equipment is required, as hydroxyl radicals are too short lived to measure in a normal laboratory environment. These studies were conducted at the

Lovelace Respiratory Research Institute and are described herein in Appendix 1. From these results, the correlation between hydroxyl radical and oxidant formation was determined. Since the ratio of hydroxyl radical to ozone formation remains constant during machine operation, measured ozone concentration is a valid means of confirming that the test article is running to specifications.

Section 5 - Materials and Methods:

The amount of Odorox® oxidants produced during animal testing was monitored continuously using a direct reading instrument, a model Polytron 7000 Series Controller and Pump module with an OV-1 (P/N 63 10 290) DrägerSensor® manufactured by Dräger. The inlet of the sampling device was placed at a height of approximately 30 inches, in the center of the rack of rat cages, which was in the center of the test room. Mr. Jeff Chalpan installed the testing equipment and monitored the output remotely via electronic data transmission. This device is an industry standard ozone meter.

The sensor ozone/oxidant data stream was sampled every thirty (30) seconds and the sampled ozone/oxidant level measurements were recorded. The total Odorox® oxidants were plotted for each 24 hour period (EST). The data is summarized below as weekly averages.



	Average Oxidant Levels (ppm)
Week 1:	0.1443 ppm
Week 2:	0.1177 ppm
Week 3:	0.1070 ppm
Week 4:	0.1189 ppm
Week 5:	0.1161 ppm
Week 6:	0.1383 ppm
Week 7:	0.1313 ppm
Week 8:	0.1085 ppm
Week 9:	0.1258 ppm
Week 10:	0.1323 ppm
Week 11:	0.1178 ppm
Week 12:	0.1193 ppm
Week 13:	0.1082 ppm

Over the testing period (13 weeks), the average Odorox® oxidant level was 0.1236 parts per million (ppm), with a median of 0.1213 ppm and a Standard Deviation of 0.01829 ppm. These measurements correspond to a steady state Odorox® hydroxyl radical formation by each machine of ~2 x 10^6 molecules/cm^3 if distributed uniformly within the treatment space) based on studies conducted by Dr. J. MacDonald at LRRI and analysis provided by Dr. David Crosley; both individuals being independent, third party experts in the field of atmospheric hydroxyl radical measurements and chemistry. These studies are summarized in Appendix 1. Normal operating oxidant levels are 0.03 to 0.1 ppm, as the OSHA guidelines for continuous 8-hour exposure is 0.1ppm. It was our goal to expose the test animals to slightly higher than normal test article operating conditions which are always below the OSHA limit. .

Section 6 - Conclusion

The oxidant levels measured confirmed that hydroxyl radicals were being formed by the Odorox® Boss™ Hydroxyl Processor air cleansing machines during the toxicology study and that the machines were operating within specifications. The amount of oxidants and by-products produced were set to be greater than what would be expected in actual occupied spaces such as a hospital, school or office setting where the machine might be used and thus provides a valid test of the possible toxicity of the output of the machine.