Plasma Air Presentation

November 10, 2010

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Agenda

- The positive effects of a higher ion count
- How Plasma Air technology works
- Product performance – laboratory testing
- Products
- Selection guides
- Target markets
- ASHRAE's *IAQ Procedure* (and the IMC Exception)
- Cost analysis of a typical project
- How to design an *IAQ Procedure* project
- CO_2 discussion
- Validation study
- Worldwide references
- Technology summary

The positive effects of a higher ion count

Activated oxygen ions:

- Charge particles causing them to stick together. Larger, heavier particles then fall to the floor or get caught by the system filter.
- Inhibit the growth of mold and bacteria by penetrating the cell's split zone
- Oxidize odorous gases
- Break down VOCs* and chemicals into CO_2 and H_2O
- Balance static electricity
- Neutralize the symptoms of Sick Building Syndrome

***Volatile Organic Compounds**

The positive effects of a higher ion count

Size Distribution of Typical Atmospheric Contaminants*

Range of Particle Size (Micron)	Average Particle Size (Micron)	Number of Particles	Percent by Particle Count	Percent by Weight
10 - 30	20	1,000	0.005	28
5 - 10	7.5	35,000	0.175	53
3 - 5	4	50,000	0.25	11
1 - 3	2	214,000	1.07	5
0 - 1	0.5	19,632,000	98.5	3
		19,932,000	100	100

* University of Minnesota

Conclusion: 99.8% of all airborne particles pass through a typical filter. Agglomerating smaller particles into larger ones using Plasma Air ionization improves filter efficiencies.

The positive effects of a higher ion count

Summary of Frank Chart

Particle Diameter (Microns)	Number of Particles per ft^3 of Air [1]	Settling Rate for Spheres (FPM) [2]	Time Required to Settle 8 Ft.
100	75	59.2	8.1 Sec
10	75×10^3	0.592	13.5 Min
1	75×10^6	0.007	19 Hours
0.1	75×10^9	0.00007	79 Days
0.01	75×10^{12}	0 (Brownian)	Never

1. Based on air containing 0.00006 grains of impurities per ft^3
2. In still air 70º F, density = 1 (S-C factors included)

Conclusion: Particles 1 micron and small (98.5% of all particles) stay airborne. Particles are typically the vehicle that transmit bacteria and virus from person to person. Agglomerating these small particles into larger ones essentially reduces airborne pollutants as they are caught by the filter

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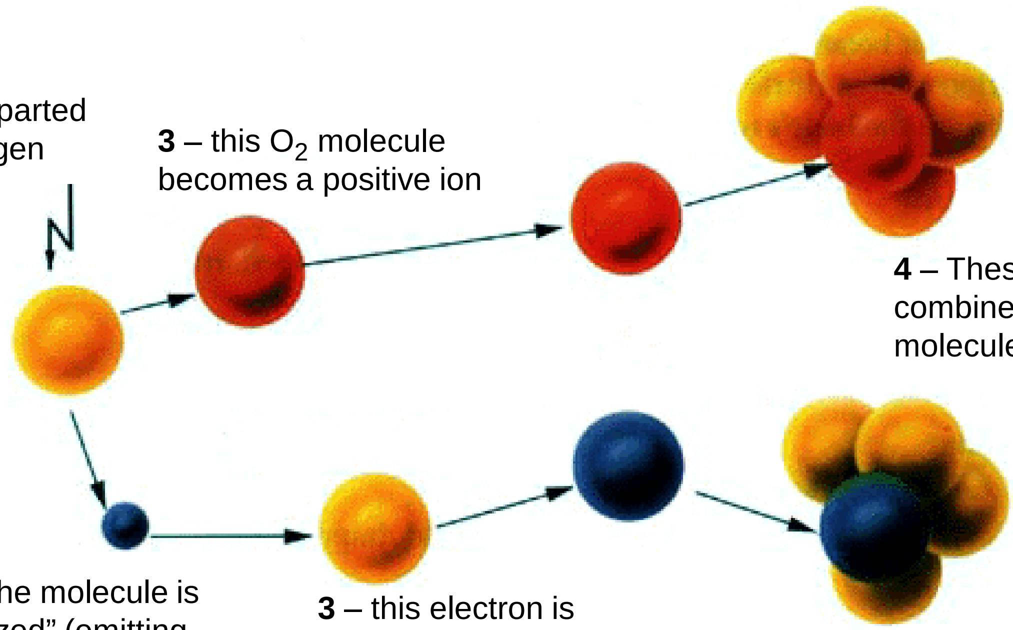
How the Plasma Air technology works

- Molecular activity



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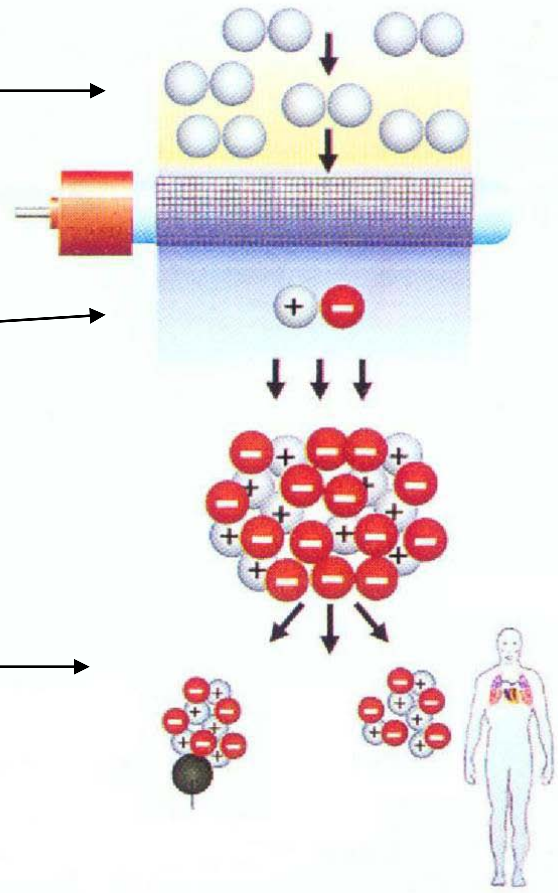
How the Plasma Air technology works

HVAC system airflow carries oxygen molecules over the Plasma Air ionization tube

The ionization tube produces positive and negative oxygen ions

Bi-polar ions are sent through the duct system into the occupied space where they can attack the problem.



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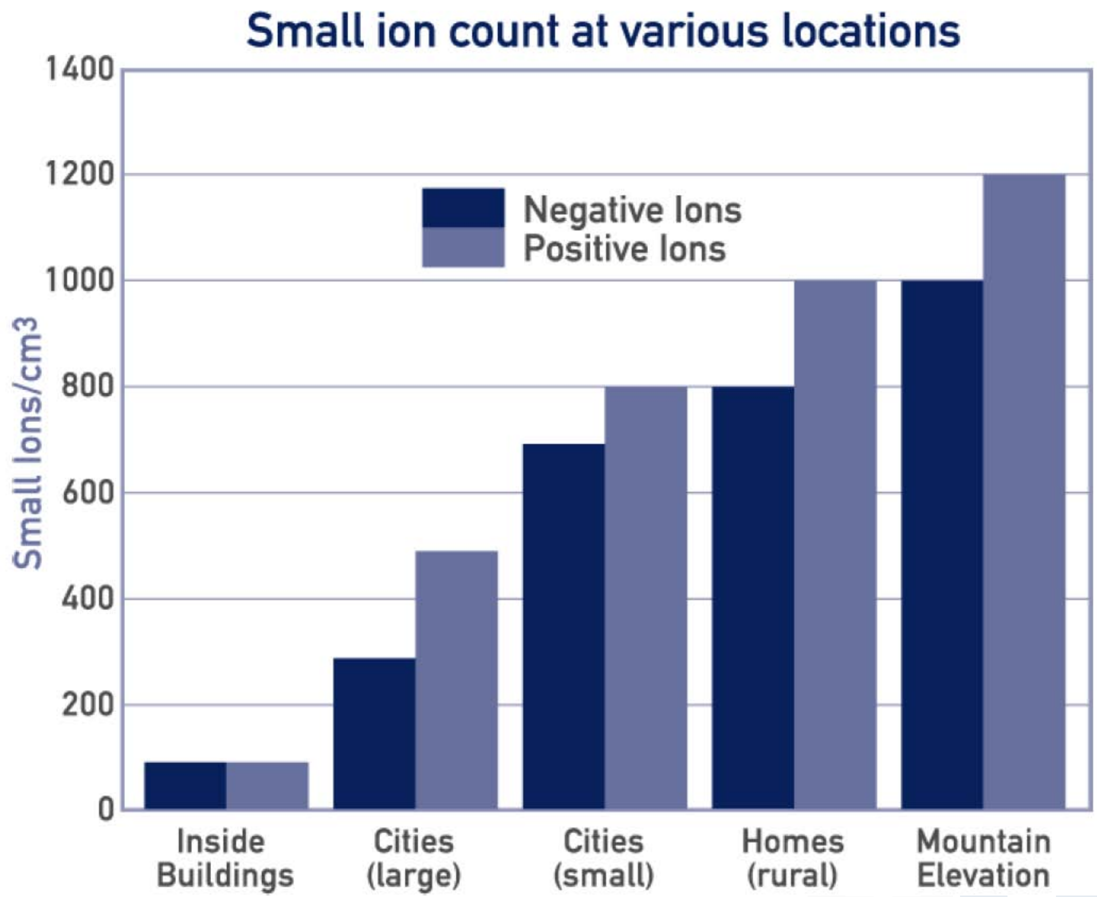
How the Plasma Air technology works

Bipolar technology reproduces mountain elevation ion levels indoors



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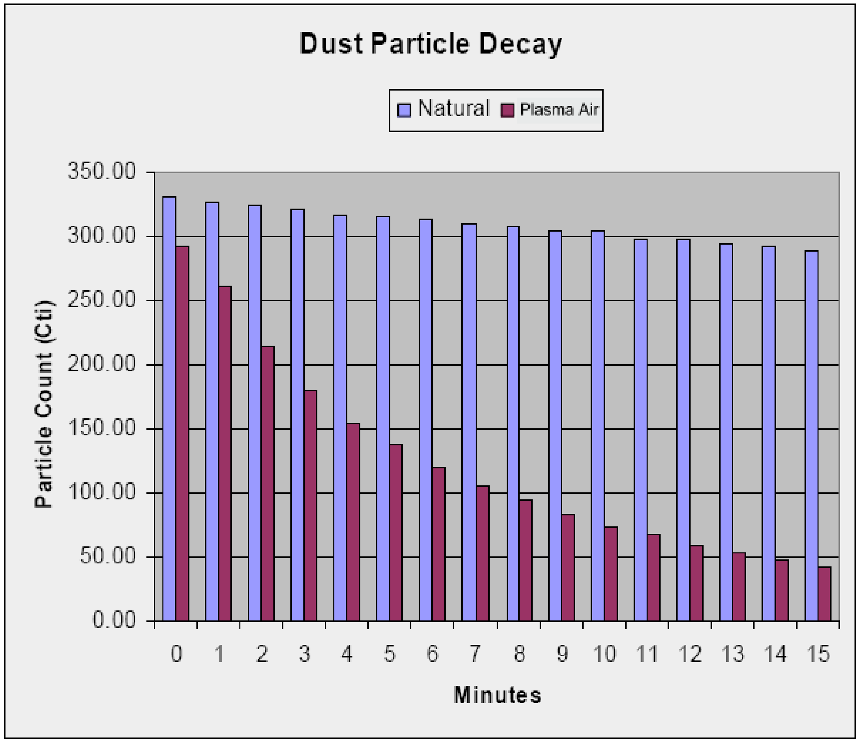
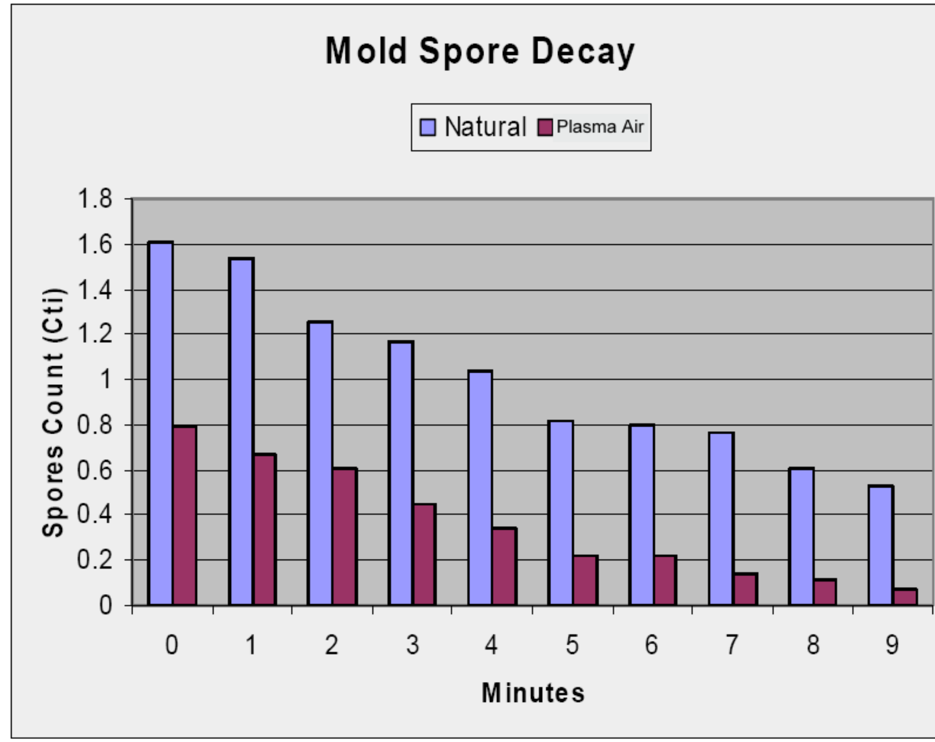
Product Performance – Laboratory Testing

Effectiveness on Airborne Particles





Natural Decay 12.8% **Bi-Polar Ionization 85.8%** **Natural Decay 67.1%** **Bi-Polar Ionization 91.1%**

SINCE 1896

REPORT
INTERTEK, ETL SEMKO
3933 US ROUTE 11 CORTLAND, NEW YORK 13045

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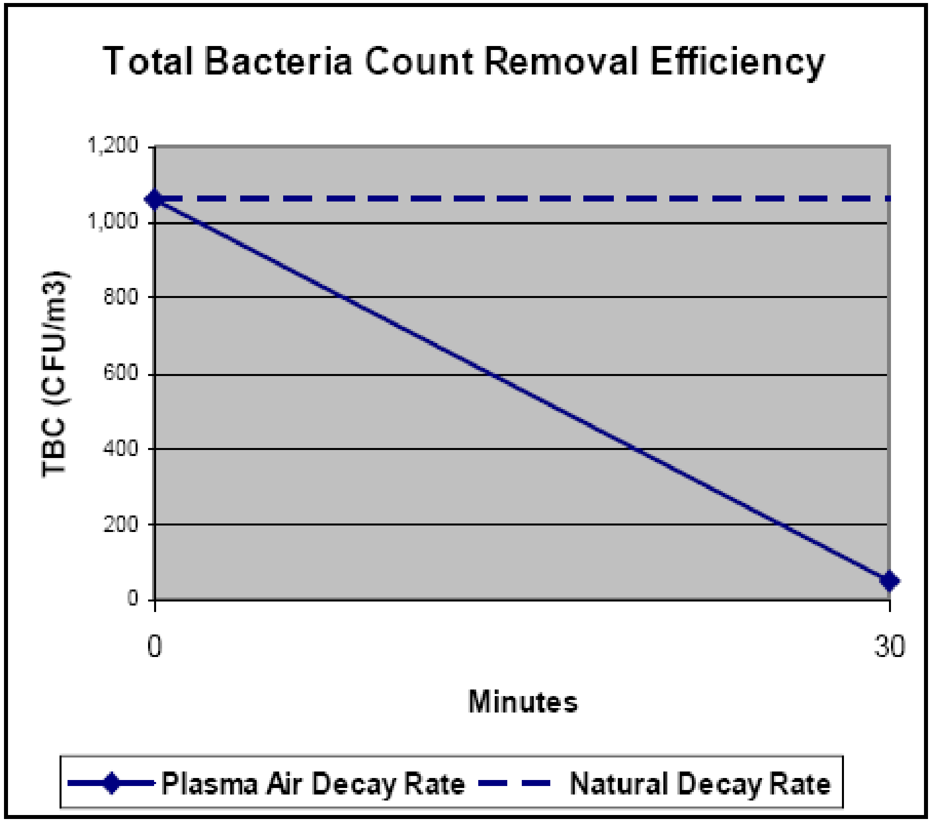
Product Performance – Laboratory Testing

Effectiveness on Airborne Bacteria

Parameters		Airborne Bacteria
Unit		CFU/m^3
Sampling description	Survey Date	
Step 1	31/10/08	1,063
Step 2 (after 15 min)	31/10/08	-
Removal rate at 15 min (%)		
Step 2 (after 30 min)	31/10/08	49
Removal rate at 30 min (%)		95.3%
Step 2 (after 45 min)	31/10/08	-
Removal rate at 45 min (%)		
Step 2 (after 1 hour)	31/10/08	-
Removal rate at 1 hour (%)		**95.3%**



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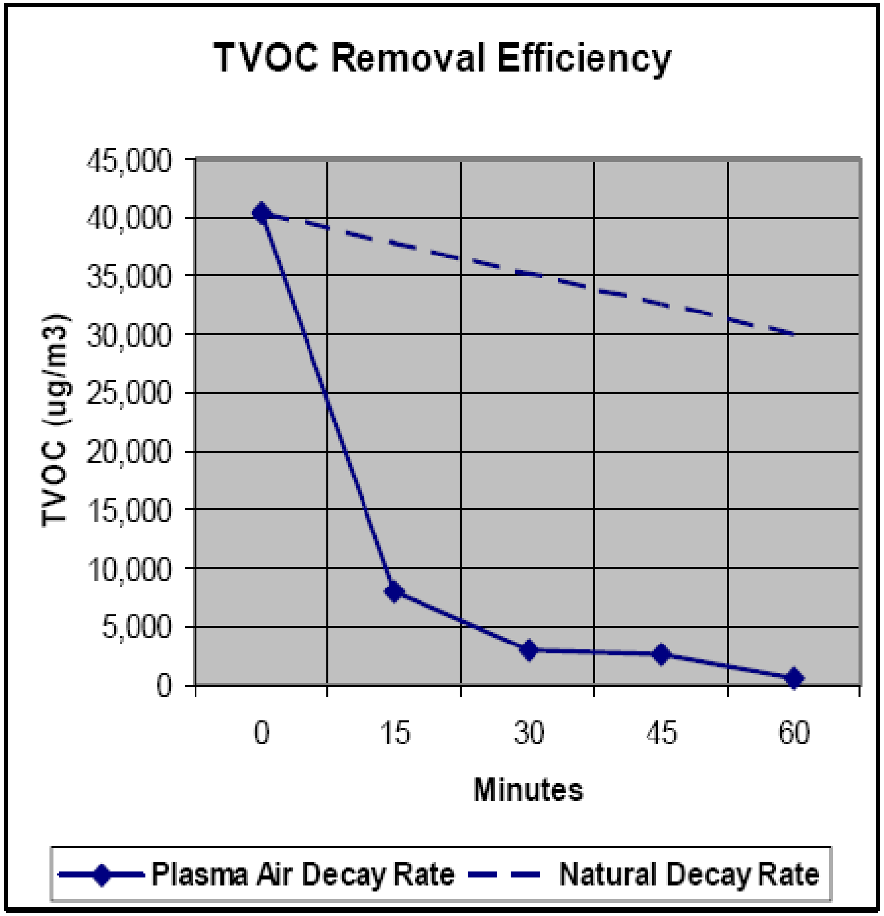
Product Performance – Laboratory Testing

Effectiveness on TVOC

Parameters		TVOC
Unit		µg/m^3
Sampling description	Survey Date	
Step 1	31/10/08	40,400
Step 2 (after 15 min)	31/10/08	7,901
Removal rate at 15 min (%)		80.4%
Step 2 (after 30 min)	31/10/08	3,002
Removal rate at 30 min (%)		92.6%
Step 2 (after 45 min)	31/10/08	2,514
Removal rate at 45 min (%)		93.8%
Step 2 (after 1 hour)	31/10/08	580
Removal rate at 1 hour (%)		**98.6%**



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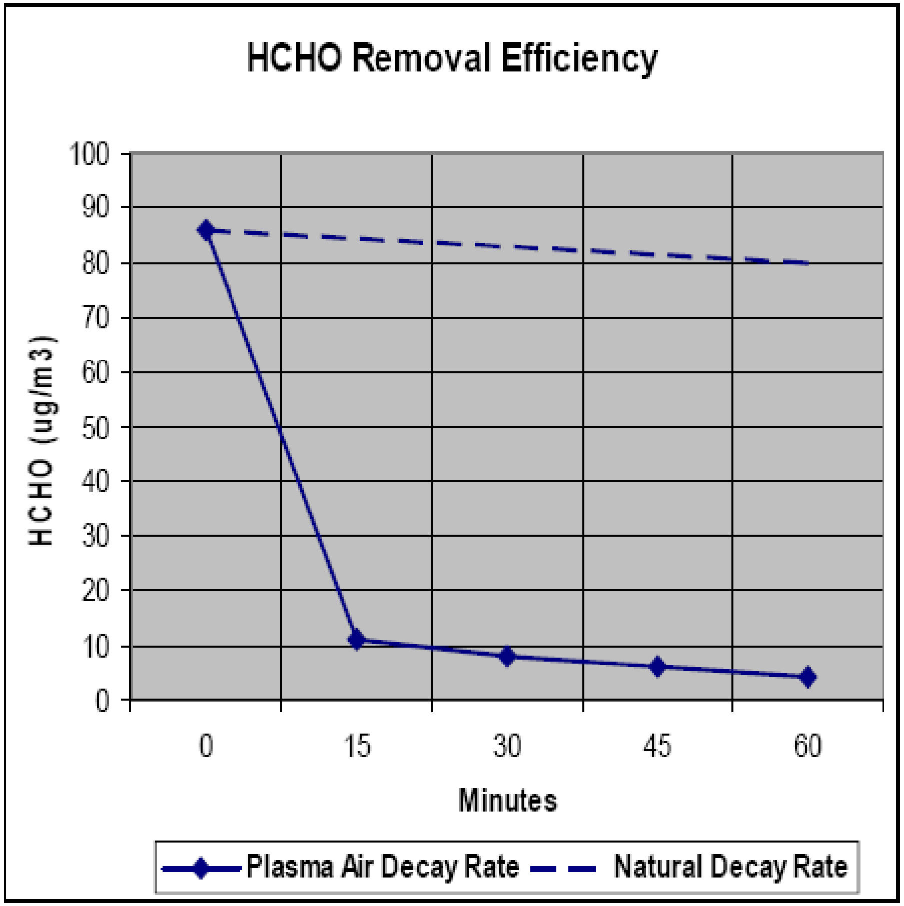
Product Performance – Laboratory Testing

Effectiveness on Formaldehyde

Parameters		HCHO
Unit		µg/m³
Sampling description	Survey Date	
Step 1	31/10/08	86
Step 2 (after 15 min)	31/10/08	11
Removal rate at 15 min (%)		87.2%
Step 2 (after 30 min)	31/10/08	8
Removal rate at 30 min (%)		90.7%
Step 2 (after 45 min)	31/10/08	6
Removal rate at 45 min (%)		93.0%
Step 2 (after 1 hour)	31/10/08	4
Removal rate at 1 hour (%)		**95.3%**



Product Performance – Laboratory Testing

Effectiveness on Smoke Particulate

Parameters		Cigarette Smoke Particulates / Liter				
Size: µm		**0.3µ**	**0.5µ**	**1.0µ**	**2.0µ**	**5.0µ**
Unit		No.	No.	No.	No.	No.
Sampling description	Survey Date					
Step 1	31/10/08	22,246,740	16,938,360	807,660	87,120	4,230
Step 2 (after 15 min)	31/10/08	21,624,480	4,231,050	119,250	24,750	1,270
Removal rate at 15 min (%)		2.80%	75.0%	85.2%	71.6%	70.0%
Step 2 (after 30 min)	31/10/08	17,363,160	1,908,000	55,170	14,760	720
Removal rate at 30 min (%)		22.0%	88.7%	93.2%	83.0%	83.0%
Step 2 (after 45 min)	31/10/08	9,894,600	723,870	31,590	6,900	360
Removal rate at 45 min (%)		55.5%	95.7%	96.1%	92.1%	91.5%
Step 2 (after 1 hour)	31/10/08	6,008,580	621,270	26,150	4,268	207
Removal rate at 1 hour (%)		**73.0%**	**96.3%**	**96.8%**	**95.1%**	**95.1%**

Products

In ductwork

- Plasma Air 100
  - For use in residential and commercial applications – up to 3,000 CFM
  - Available with C, D, and E length ionization tubes
  - Can be installed in duct systems or inside an AHU
  - 101 →120 Volts
  - 102 →230 Volts

In ductwork

- Plasma Air 200
  - For use in residential and commercial applications – up to 5,000 CFM
  - Available with D and E length ionization tubes
  - Can be installed in duct systems or inside an AHU
  - 201 →120 Volts
  - 202 →230 Volts

In ductwork

- Plasma Air AFS-MF
  - For use in residential or commercial applications
  - Mounting frame is installed onto duct with sheet metal screws
  - Ionizer is mounted to frame with machine screws
  - Any voltage, any tube size
  - Unit includes a pressure differential switch mounted on back

In ductwork

- Plasma Air 50E
  - For use in commercial applications up to 8,000 CFM
  - Equipped with five E tubes
  - 51E → 120 Volts
  - 5 step ionization control knob
  - Low voltage BAS communication

- Plasma Air 50F
  - For use in commercial applications up to 10,000 CFM
  - Equipped with five F tubes
  - 51F → 120 Volts
  - 5 step ionization control knob
  - Low voltage BAS communication

Other Products

- Plasma Air Mini-ionizer
  - For use in residential or commercial applications up to 400 CFM
  - Designed to be mounted in supply grille of PTAC, FCU or mini-split.
  - Small size: 2”X1.5”X0.5”
  - Transformer from 120V, 230V or 24V will be provided
  - Can be OEM or retrofit

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Residential Selection Guide

Step 1) To determine the Pollutant Load Factor of the home, total the points based on the following criteria:

_____ 2 points for each smoker in the home

_____ 1 point for each pet in the home

_____ 1 point for each asthma or allergy sufferer in the home

_____ 1 point if there is heavy cooking performed on a regular basis in the home

_____ 2 points if ceiling heights are greater than 9 feet in significant areas of the home

_____ **TOTAL NUMBER OF POINTS – this is your Pollutant Load Factor**

Step 2) Using the Pollutant Load Factor and knowing the approximate square footage being served by the air handler, look up the tube size and setting from the chart below. If there are two or more air handlers serving the home, consider each air handler separately.

SQUARE FOOTAGE SERVED BY AIR HANDLER

POLLUTANT LOAD FACTOR	400	800	1200	1600	2000	2400	2800	3200
0-4	C @1	C @1	C @3 or D @1	C @4 or D @2	D @4 or E @1	D @5	E @3	E @4
5-8	C @1	C @2	C @4 or D @2	D @4 or E @2	E @3	E @4	E @5	E @5
9-12	C @1	C @3 or D @1	D @4	E @3	E @4	E @5	200D @3	200D @5
13-16	C @1	C @4 or D @2	D @5	E @4	E @5	200D @3	200D @5	200E @3
>16	C @2	C @5 or D @3	E @3	E @5	200D @3	200D @5	200E @3	200E @5

Notes:
1. Letter indicates tube length and number indicates ionization level setting on front of unit.
2. Unshaded area of chart requires the use of a Model 100 unit. Shaded area requires the use of a Model 200 unit.

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Commercial Selection Guide

	POLLUTANT LOAD FACTOR
A	Office, classroom, gymnasium, arena - low pollutant levels
B	Casino, day care center, nursing home, locker room, health club, restaurant - medium pollutant levels
C	Animal hospital, light manufacturing, smoking areas, nail/beauty salons - heavy pollutant levels
D	Industrial facility, heavy manufacturing, or garbage room - very heavy pollutant levels
E	Heavy pollution or odors typical of a waste water treatment facility

AIRFLOW (CFM) OF AIR HANDLER

POLUTANT LOAD FACTOR

	CFM/Sq Ft	1,000	2,000	3,000	5,000	10,000	20,000
A1	>2.0	100C @5	100D @5	100E @5	200E @3	50E @5	50F @5
A2	1.5 - 2.0	100D @3	100E @3	200D @3	50E @1	50F @3	(2) 50F @3
A3	<1.5	100D @5	100E @5	200D @5	50E @3	50F @5	(2) 50F @5
B	N/A	100D	100E	200E	50E	(2) 50E	(3) 50F
C	N/A	100E	200E	50E	(2) 50E	(3) 50F	(6) 50F
D*	N/A	200E	50E	50F	(2) 50F	(4) 50F	(8) 50F
E*	N/A	*Consult Plasma Air Engineering Department for Engineering Support					

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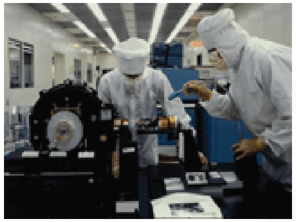
Target markets

	Typical Contaminant						
Application	Mold	Bacteria	Viruses	Odors	VOCs	Smoke	Chemicals
Homes	X	X	X	X	X	X	X
Schools	X	X	X	X	X		
Hospitals	X	X	X	X	X		
Nursing Homes	X	X	X	X	X		
Daycare Centers	X	X	X	X			
Office Buildings	X	X	X		X		
Casinos		X		X			X
Restaurants	X	X		X		X	
Hotels/Motels	X			X	X		X
Nail/Beauty Salons				X	X		X
Airport Terminals	X	X	X	X	X		X
Sewage Treatment Plants		X		X			X
Water Treatment Facilities	X	X		X			X
Fire Houses				X		X	
Airplanes, Boats, RVs	X	X	X	X			





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ASHRAE's *IAQ Procedure* (and the IMC Exception)

- ASHRAE and the IMC both allow for the reduction of outside air intake by utilizing the *IAQ Procedure*

ASHRAE

based on space type/application, occupancy level, and floor area. **Note:** The Ventilation Rate Procedure minimum rates are based on contaminant sources and source strengths that are typical for the listed space types.

6.1.2 IAQ Procedure. This is a design procedure in which outdoor air intake rates and other system design parameters are based on an analysis of contaminant sources, contaminant concentration targets, and perceived acceptability targets. The IAQ Procedure allows credit to be taken for controls that remove contaminants (for example, air cleaning devices) or for other design techniques (for example, selection of materials with lower source strengths) that can be reliably demonstrated to result in indoor contaminant concentrations equal to or lower than those achieved using the Ventilation Rate Procedure. The IAQ Procedure may also be used where the design is intended to attain specific target contaminant concentrations or levels of acceptability of perceived indoor air quality.

6.2 Ventilation Rate Procedure

The design *outdoor air intake flow* (V_{ot}) for a ventilation system shall be determined in accordance with Sections 6.2.1 through 6.2.9.

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International Mechanical Code

and 24 inches (610 mm) from the enclosing walls.

403.2 Outdoor air required. The minimum ventilation rate of outdoor air shall be determined in accordance with Section 403.3.

Exception: Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces,

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Outside Air Reduction

Cost Analysis of a Typical Project – Ventilation Rate Method vs. IAQ Procedure

St. Andrews School, Silver Spring, MD

	Ventilation Rate (without Ionization)	IAQ Procedure (with Ionization)
Square Footage	54,300 Sq Ft	54,300 Sq Ft
Total Supply Air	56,600 CFM	50,800 CFM
Total Outside Air	25,850 CFM (45%)	10,300 CFM (20%)
Total Cooling Required	222 Tons	158 Tons

Reduction in cooling requirements → 64 Tons

Cost savings due to reduction in cooling → $128,000

Cost to provide ionization to this school → $26,300

Net first cost savings to the owner → **$101,700**

Ongoing annual savings to the end user → $16,080 – $3,800 (annual tube replacement) = **$12,280**

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How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

1. Identify Contaminants of Concern (COC)
2. Set target concentration for COCs
3. Specify design level of acceptability
4. Select design approach – one or more of the following:
    - Mass balance analysis
    - Similar buildings
    - Monitoring
    - Combination of IAQ and VRP
5. Design documentation
    - Maintain records of 1-4 above

How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

Step 1: Identify Contaminants Of Concern (COCs)

In schools, office buildings, and places of assembly, the contaminants of concern are those contaminants emitted by people. The 2003 ASHRAE Applications handbook lists some gaseous contaminants emitted by humans in chapter 45 as:

Contaminant	Generation Rate Per Person (ug/hr)
Ammonia	15,600
Carbon Monoxide	10,000
Hydrogen Sulfide	15
Methane	1710
Propane	1.3

Notes:

1. Because of the relatively high level of ammonia and because it is easily measured, it can be used as an indicator of system efficiency.
2. There are other gaseous contaminants emitted by humans, but their levels are immeasurable with commercial grade detection devices.

How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

Step 2: Set target concentration limits

The target concentration levels for these contaminants would result if the Ventilation Rate Procedure were used. These concentrations can be determined using the equation in ASHRAE 62.1-2007 Appendix C. $Cs - Co = N / Vo$

Where:
Cs = Concentration in space (liters/liter of air)
Co = Concentration in outside air (liters/liter of air) – for most indoor pollutants = 0
N = Generation rate per person (liters/min)
Vo = Outside air flow rate per person (liters/min)

Example: Ammonia is emitted at the rate of 15,600 µg/hr per person; this is equivalent to 0.00373 liters per minute. For an outside air flow rate of 13.4 CFM, the steady state concentration in parts per million would be 0.928.

For a typical classroom with an outside air flow rate of 13.4 CFM per person, the target concentrations are:

Contaminant	Concentration (ppm)
Ammonia	0.928
Carbon Monoxide	0.361
Hydrogen Sulfide	0.0005
Methane	0.098
Propane	0.00003

How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

Step 3: Specify design level of acceptability

Per the International Mechanical Code, the design level of acceptability is "equal to or less than" the concentration which would result using the Ventilation Rate Procedure. For a typical classroom with an outside air flow rate of 13.4 CFM per person, these levels are:

Contaminant	Concentration (ppm)
Ammonia	0.928
Carbon Monoxide	0.361
Hydrogen Sulfide	0.0005
Methane	0.098
Propane	0.00003

How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

Step 4: Select a design approach

The mass balance method using ASHRAE 62.1 Appendix D equations follows:

Appendix D - The Mass Balance Method Example

TABLE D-1 Required Outdoor Air or Space Contaminant Concentration with Recirculation and Filtration

Required Recirculation Rate			Required Outdoor Airflow	Space Contaminant Concentration
Filter Location	Flow	Outdoor Airflow		
None	VAV	100%	$V_o = \frac{N}{E_v F_r (C_s - C_o)}$	$C_s = C_o + \frac{N}{E_v F_r V_o}$
A	Constant	Constant	$V_o = \frac{N - E_v R V_r E_f C_s}{E_v (C_s - C_o)}$	$C_s = \frac{N + E_v V_o C_o}{E_v (V_o + R V_r E_f)}$
A	VAV	Constant	$V_o = \frac{N - E_v F_r R V_r E_f C_s}{E_v (C_s - C_o)}$	$C_s = \frac{N + E_v V_o C_o}{E_v (V_o + F_r R V_r E_f)}$
A	VAV	Proportional*	$V_o = \frac{N - E_v F_r R V_r E_f C_s}{E_v F_r (C_s - C_o)}$	$C_s = \frac{N + E_v F_r V_o C_o}{F_r E_v (V_o + R V_r E_f)}$
B	Constant	Constant	$V_o = \frac{N - E_v R V_r E_f C_s}{E_v [C_s - (1 - E_f) C_o]}$	$C_s = \frac{N + E_v V_o (1 - E_f) C_o}{E_v (V_o + R V_r E_f)}$
B	VAV	100%	$V_o = \frac{N}{e F_r [C_s - (1 - E_f) C_o]}$	$C_s = \frac{N + e F_r V_o (1 - E_f) C_o}{e F_r V_o}$
B	VAV	Constant	$V_o = \frac{N - E_v F_r R V_r E_f C_s}{E_v [C_s - (1 - E_f) C_o]}$	$C_s = \frac{N + E_v V_o (1 - E_f) C_o}{E_v (V_o + F_r R V_r E_f)}$
B	VAV	Proportional	$V_o = \frac{N - E_v F_r R V_r E_f C_s}{E_v F_r [C_s - (1 - E_f)(C_o)]}$	$C_s = \frac{N + E_v F_r V_o (1 - E_f) C_o}{E_v F_r (V_o + R V_r E_f)}$

* Proportional indicates that the outdoor airflow varies with the supply airflow, such that the outdoor airflow is equal to the design value times the flow reduction factor F_r.

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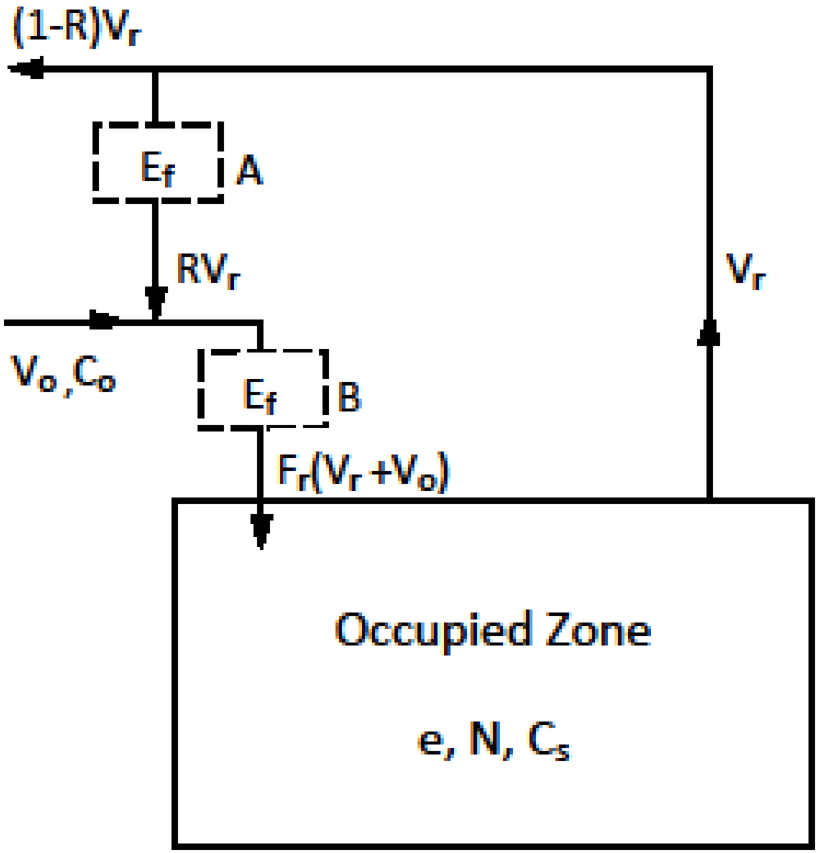
Appendix D - The Mass Balance Method Example

$$Cs = \frac{N + Ev\ Vo\ Co(1 - Ef)}{Ev\ (Vo + R\ Vr\ Ef)}$$



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Appendix D - The Mass Balance Method Example

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ASHRAE 62.1: IAQ Procedure

Space Contamination Calculations Using Appendix D Equations

11/13/2009

Project Information

Project Name	ABC School	Number of People	25	Plasma Air Model	101 D
Classroom No.	123	Emmission Rate/Person (L/min)	0.00037	Ionization Setting	3
Area (Sq. Ft.)	1000	Ionization Efficiency (E_f)	0.680	Space Contaminant	Ammonia
Ceiling Ht (Ft)	9.25				
Volume (Ft^3)	9,250				

Calculation of Space Contaminant Using Ventilation Rate OA

Outside Airflow Rate per Person 14.8 CFM

Classroom Airflows	CFM	L/min
Supply Air	1080	30586
Outside Air	370	10478
Return Air	710	20107

For constant supply air and constant outside air, use:

$$Cs = \frac{N+Ev\ Vo\ Co(1 - Ef)}{Ev\ (Vo+R\ Vr\ Ef)}$$

Where:

Factor	Description	Value	Units
N	Contaminant Generation Rate	0.00925	L/min
Ev	System Ventilation Efficiency	0.8	
Vo	Outdoor Air Flow Rate	10478	L/min
Ef	Filter Efficiency	0.000	
Co	Contaminant Concentration, OA	0	ppm
R	Recirculation Flow Factor =Vr/(Vo+Vr)	0.66	
Vr	Return Air Flow Rate	20107	L/min
Cs	Contaminant Concentration, space	1.103	ppm

Calculation of Space Contaminant Using IAQ Procedure OA

Specified Outside Airflow Rate per Person 7.4 CFM

Classroom Airflows	CFM	L/min
Total Supply Air	1080	30586
Outside Air	185	5239
Return Air Flow Rate	895	25346

For constant supply air and constant outside air, use:

$$Cs = \frac{N+Ev\ Vo\ Co(1 - Ef)}{Ev\ (Vo+R\ Vr\ Ef)}$$

Where:

Factor	Description	Value	Units
N	Contaminant Generation Rate	0.00925	L/min
Ev	System Ventilation Efficiency	0.9	
Vo	Outdoor Air Flow Rate	5239	L/min
Ef	Filter Efficiency	0.680	
Co	Contaminant Concentration, OA	0	ppm
R	Recirculation Flow Factor =Vr/(Vo+Vr)	0.83	
Vr	Return Air Flow Rate	25346	L/min
Cs	Contaminant Concentration, space	0.526	ppm

How to Design an IAQ Procedure Project

ASHRAE 62.1 2007 IAQ Procedure Design Compliance

Step 5: Documentation

Maintain records of documents and calculations used in steps 1 thru 4.

CO_2 Discussion

- Bipolar ionization does not have an effect on carbon dioxide. Therefore, reducing outside air will result in an increase in the carbon dioxide level in the space.
- CO_2 levels are calculated to be:
  - 996 PPM at 15 CFM outside air
  - 1592 PPM at 7.5 CFM outside air
  - 2188 PPM at 5 CFM outside air
- ASHRAE does not consider CO_2 a COC
- CO_2 is an indicator of occupancy
- 5,000 PPM is OSHA's 8-hour maximum

TABLE B-1 Comparison of Regulations and Guidelines Pertinent to Indoor Environments[a]

(The user of any value in this table should take into account the purpose for which it was adopted and the means by which it was developed.)

	Enforceable and/or Regulatory Levels			Non-Enforced Guidelines and Reference Levels			
	NAAQS/EPA (Ref. B-4)	OSHA (Ref. B-5)	MAK (Ref. B-2)	Canadian (Ref. B-8)	WHO/Europe (Ref. B-11)	NIOSH (Ref. B-13)	ACGIH (Ref. B-1)
Carbon dioxide		5000 ppm	5000 ppm 10,000 ppm [1 h]	3500 ppm [L]		5000 ppm 30,000 ppm [15 min]	5000 ppm 30,000 ppm [15 min]
Carbon monoxide[c]	9 ppm[g] 35 ppm [1 h][g]	50 ppm	30 ppm 60 ppm [30 min]	11 ppm [8 h] 25 ppm [1 h]	90 ppm [15 min] 50 ppm [30 min] 25 ppm [1 h] 10 ppm [8 h]	35 ppm 200 ppm [C]	25 ppm

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Validation Study

A study was performed at a completed installation designed using the IAQ Procedure. Contaminant levels were independently validated to verify accuracy of the IAQ Procedure calculations and conformance with Standard 62.1.

-001 1 (ROOM 237) Samp Date: 10/02/08 Silica Gel Tube Trtd with Sulfuric Acid

-	NH3 Front		< 2.5 ug	2.5 ug		10/08/08
-	NH3 Rear		ND	2.5 ug		10/08/08
-	NH3 Total	19.4 L	< 2.5 ug	2.5 ug	< 0.185 ppm	10/08/08

-002 1 (ROOM 227) Samp Date: 10/02/08 Silica Gel Tube Trtd with Sulfuric Acid

-	NH3 Front		< 2.5 ug	2.5 ug		10/08/08
-	NH3 Rear		ND	2.5 ug		10/08/08
-	NH3 Total	19.8 L	< 2.5 ug	2.5 ug	< 0.181 ppm	10/08/08

-003 3 (ROOM 218) Samp Date: 10/02/08 Silica Gel Tube Trtd with Sulfuric Acid

-	NH3 Front		< 2.5 ug	2.5 ug		10/08/08
-	NH3 Rear		ND	2.5 ug		10/08/08
-	NH3 Total	18.5 L	< 2.5 ug	2.5 ug	< 0.194 ppm	10/08/08

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Summary

Why use the IAQ Procedure?

- Reduces exposure to polluted OA
- Avoids excessive latent heat load of OA
- Provides equipment capacity reduction
- Reduces energy requirements
- Enhances building life cycle cost
- Enhances IAQ and sustainability
- Improves system cleanliness
- Improves moisture and humidity control
- Meets EPACT Requirements

Worldwide reference projects

- Goverment
  - 911 Call Center – Los Angeles, CA
  - Army Barracks – Fort Benning, GA
- Schools
  - Indian Creek School - Crownsville, MD
  - Patrick Henry College – Purcellville, VA
  - St. Andrews School - Silver Spring, MD
  - Cass High School – White, GA
  - Faith Christian School - Grapevine, TX
  - Georgetown Middle School - KY
  - Annapolis Area School - Annapolis, MD
  - Nampa Christian School - Nampa, ID
  - Winterville Elementary School – Atlanta
  - Orangewood School – Maitland, FL
  - Kincaid Elementary School – Marietta Ga
- Churches
  - Rejoice Lutheran Church – Frisco, TX
  - Cornerstone Church of Ames – Ames, IA
  - Community Baptist – Chantilly, VA
  - Immanuel Lutheran – Wentzville, MO
- Casinos
  - Chukchansi Hotel and Casino, CA
  - McDowell Mountain Casino, AZ
  - San Manuel Casino – Highland, CA
- Waste Water Treatment
  - Sanitary Sewers – Lexington, KY
  - Carmel WWTP – Carmel, IN
  - City of Three Rivers – Michigan
- Airports
  - LAX Airport – Los Angeles, CA
  - LAX Fire Station – Los Angeles, CA
  - Kloten Airport, Zurich, Switzerland
  - Frankfurt Airport – Germany
- Offices
  - Mountain America Credit Union - UT
  - UBS Childcare Ctr – Stamford CT
  - Vornado 640 5th Ave – New York, NY
  - SL Green Graybar Bldg – New York
  - L&L Holdings 142 West 57th – NYC
  - Trinity Real Estate – 75 Varick St

PLASMA AIR INTERNATIONAL

Technology Summary

- Bi-polar technology produces both positive and negative oxygen ions which agglomerate airborne particles and reduce odors, VOCs, bacteria and mold.
- Product reproduces mountain-elevation air quality indoors
- Technology addresses problem at the source of contaminants – in the occupied space. Other products rely on return air bringing contaminants back to air handler.
- Strength of ions allows unit to be installed in central duct system providing for a whole system solution.
- Efficacy of technology has been verified by ETL (Intertek-SEMKO)
- Plasma Air's technology is UL listed. See listing at www.ul.com