Greetings!

Air Ionization: Outdoor Air Reduction Makes Lots of (Dollars and) Sense!

During another of my recent presentations of the Aerisa air purification technology, a client asked, **"If I clean the air within a facility's admin area, can't I reduce outdoor air and save on heating and cooling?"**

ABSOLUTELY!

Through use of the IAQ Procedure in ASHRAE Standard 62.1, "Ventilation for Acceptable Indoor Air Quality [IAQ]," outdoor air (OA) intake may be significantly reduced **up to 66%** when utilizing Aerisa's ionization technology. Facilities such as administrative offices, schools, churches, gyms, and auditoriums are all candidates - any place with lots of people. By ionizing (cleaning) the air within the facility, OA required to dilute emitted pollutants may be greatly reduced.

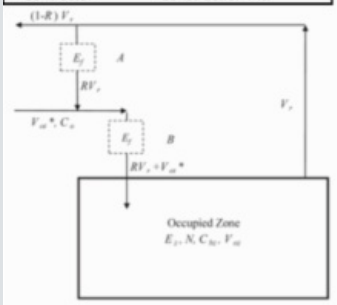
When OA is reduced, the following compelling benefits are realized on new construction projects:

- Lower capital costs for heating and cooling equipment
- Smaller ductwork, electrical service, roof penetrations and structural supports
- Reduced installation costs
- Reduced ongoing energy costs
- Reduced project financing costs

For existing AC systems or replacements, the ongoing energy savings will offset the cost of Aerisa ionization equipment **in only a few years.**

Provided with some basic design information, Aerisa will return a full set of ASHRAE 62.1-2013 IAQ Procedure calculations documenting that resulting pollutant concentrations remain lower than acceptable levels. A calculation example is shown below:

PROJECT INFORMATION	
Date	12/01/14
Project Name	Facility
Project Location	Anyplace USA
Engineer	Engineering Inc.
Rep Firm	Representative Inc.
Rep Contact	Joe Smith
Contractor	Construction Inc.



Ventilation System Schematic

ZONE INFORMATION	
Name (ID)	Auditorium
Floor Area (Az), ft²	3,830
Height (ft)	13
Max Occupancy (Pz)	438
Supply Air (cfm)	6,400
Category	Public Assembly Spaces
Subcategory	Auditorium Seating Area
Activity Level	Filling, seated: Met = 1.2
CONFIGURATION INFORMATION	
Filter Location	B
Flow	Constant
Outdoor Airflow	Constant
Design Flow Reduction Factor (Fr)	N/A

$$C_{bz} = \frac{N + E_z V_{oz}(1 - E_f)C_o}{E_z(V_{oz} + RV_r E_f)}$$

Table D-1 Applicable Contaminant Concentration Formula

VENTILATION RATE PROCEDURE	
OA/Person (Rp) [Table 6.2.2.1], cfm	5.0
OA/Floor Area (Ra) [Table 6.2.2.1], cfm/ft²	0.06
OA Breathing Zone (Vbz)	Rp * Pz + Ra * Az
Vbz, cfm	2,420
Zone Outdoor Airflow (Voz)	Vbz/Ez
Ez [Table 6.2.2.2]	1.0
Voz, cfm	2,420
Voz, L/min	68,529
Return Air (Vr), cfm	3,980
Vr, L/min	112,719
Voz/Person, cfm/person	5.52
Air Exchanges/Hour	7.71

IAQ PROCEDURE	
Recommended OA (Voz), cfm	1,314
Voz, L/min	37,212
Voz/Person, cfm/person	3.00
Return Air (Vr), cfm	5,086
Vr, L/min	144,036

OUTSIDE AIR SAVINGS, cfm	1,106

INDOOR CONTAMINANTS OF CONCERN

Contaminant Compound (CAS#)	Max Allowable Conc. Limit (ppm)	Max Allowable Conc. Limit (µg/m³)	VRP - Steady State Without Ionization (µg/m³)	IAQP - Steady State With Ionization (µg/m³)	Conc. Change Using IAQP	IAQP Conc. As % of Max	Less Than Max with Reduced OA?
Acetaldehyde 75-07-0	7.7725E-02	1.4000E+02	7.1284E+00	3.6034E+00	-49.45%	2.574%	TRUE
Acetone 67-64-1	2.4837E+00	5.9000E+03	5.9199E+01	3.6055E+01	-39.10%	0.611%	TRUE
Ammonia 7664-41-7	2.5000E+00	1.7382E+03	1.6630E+03	1.2360E+03	-25.68%	71.106%	TRUE
Benzene 71-43-2	1.8781E-02	6.0000E+01	4.7044E+00	1.4211E+00	-69.79%	2.369%	TRUE
Carbon Dioxide 124-38-9	5.0000E+03	9.0000E+06	4.4010E+06	7.5744E+06	72.11%	84.160%	TRUE
Carbon Monoxide 630-08-0	9.0000E+00	1.0310E+04	3.0652E+03	3.9617E+03	29.25%	38.424%	TRUE
Chloroform 67-66-3	6.1437E-02	3.0000E+02	1.3196E+00	6.8631E-01	-47.99%	0.229%	TRUE
Dioxane [1,4-] 123-91-1	8.3248E-01	3.0000E+03	4.2610E-02	2.6162E-02	-38.60%	0.001%	TRUE
Hydrogen Sulfide 7783-06-4	2.8697E-02	4.0000E+01	2.0979E+00	1.4104E+00	-32.77%	3.526%	TRUE
Methane 74-82-8	1.0000E+02	6.5603E+04	1.2822E+03	8.9572E+02	-30.14%	1.365%	TRUE
Methanol 67-56-1	1.1447E+00	1.5000E+03	6.3915E-01	5.5854E-01	-12.61%	0.037%	TRUE
Methyl Chloroform (1,1,1-Trichloroethane) 71-55-6	1.8327E-01	1.0000E+03	5.3540E+00	4.5284E+00	-15.42%	0.453%	TRUE
Methyl Ethyl Ketone (2-Butanone) 78-93-3	1.0000E+01	2.9493E+04	1.0347E+03	6.8370E+02	-33.92%	2.318%	TRUE
Methylene chloride 75-09-2	1.1514E-01	4.0000E+02	1.1774E+01	1.0025E+01	-14.86%	2.506%	TRUE
Phenol 108-95-2	5.1960E-02	2.0000E+02	4.3766E+01	2.2530E+01	-48.52%	11.265%	TRUE
Propane 74-98-6	1.0000E+02	1.8037E+05	1.8138E+01	5.7571E+00	-68.26%	0.003%	TRUE
Tetrachloroethane 79-34-5	1.0197E-03	7.0000E+00	1.4913E-01	1.5260E-01	2.32%	2.180%	TRUE
Tetrachloroethylene 127-18-4	5.1604E-03	3.5000E+01	2.6065E+00	3.9427E-01	-84.87%	1.126%	TRUE
Toluene 108-88-3	7.9607E-02	3.0000E+02	7.5501E+00	1.8478E+00	-75.53%	0.616%	TRUE
Vinyl Chloride Monomer (Chloroethene) 75-01-4	1.0000E+00	2.5562E+03	3.8770E+00	7.8632E-01	-79.72%	0.031%	TRUE
Xylenes 1330-20-7, 95-47-6	1.6120E-01	7.0000E+02	4.4003E+00	2.3961E-01	-94.55%	0.034%	TRUE

Click on the graphic for a larger view

Aerisa's ionization technology for commercial applications is based on ions produced by an ion generator, configured either with needlepoint brush electrodes or tubes. These ion generators are mounted either inside a building's air handler or on the supply ductwork. Highly ionized air with millions of ions (O_2^+ and O_2^-) are delivered in each cubic foot of air. Because of their charge, these ions **proactively oxidize the contaminants** and **agglomerate airborne particulate** to vastly improve indoor air quality. As a result, OA intake may be significantly reduced saving lots of money - it's a no brainer!

Please visit Aerisa.com or contact me with any questions you may have.

Happy Holidays,

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