

## CASE STUDY

### Plasma Air's PlasmaSoft™ Helps Atlas Design & Engineering Inc. Reduce Outside Air Intake and Associated Equipment Costs in Client Buildings

- Reduced outside air intake
- PlasmaSoft™ enabled easy calculations for ASHRAE compliance
- Lowered CapEx and OpEx associated with HVAC equipment

“PlasmaSoft™ is a unique program, unlike anything we've seen in the past.”

-John Bruno  
Atlas Design and Engineering



## PlasmaSoft™

### BACKGROUND

Atlas Design & Engineering is a multi-disciplined engineering firm with expertise in structural, mechanical, electrical and plumbing design. Located in Fort Myers, Florida, the award-winning firm specializes in projects ranging from residential additions and remodels to large-scale commercial buildings.

For Atlas, fulfilling customers' engineering and design requests is simple: deliver functional, low-maintenance solutions that lower costs and simplify building management.

When it comes to purifying indoor air, Atlas is constantly on the lookout for innovative solutions that cut costs and provide a healthy, comfortable, and compliant indoor air environment for their customers, while simultaneously minimizing the use of outside air – a highly cumbersome and expensive process.



### THE CHALLENGE

Typical hot and humid Floridian weather is not particularly conducive to creating and sustaining an optimal cool, dry and purified indoor air environment. As Atlas works with clients to develop HVAC solutions that both fit their individual needs and satisfy ASHRAE standards, identifying useful tools and technologies to achieve this type of environment within their buildings is a critical component of the overall process — and precisely what customers are looking for when choosing an engineering partner during the initial stages of facility design.

Outside air intake is necessary to provide proper ventilation for healthy indoor environments. However, too much outside air presents a particularly challenging situation in humid locations, as the outside air must be properly conditioned for indoor use. Such air conditioning can easily burn through energy and equipment resources, and therefore, budgets. With the inability to perform complex Indoor Air Quality Procedure (IAQP) calculations, many Atlas customers were forced to rely on the expensive Ventilation Rate Method, resulting in many of these building owners and operators using more outdoor air than necessary in an attempt to maintain ASHRAE compliance.

### THE SOLUTION

Atlas selected Plasma Air's PlasmaSoft™ IAQP software to help its customers properly reduce outside air intake. PlasmaSoft™ provides a turnkey, easy-to-use solution for the execution of complex calculations required by the IAQP. The first web-based program of its kind, PlasmaSoft™ offers users the ability to calculate and compare contaminant levels to potentially reduce code-required outside air intake, resulting in lower costs to the customer — an outcome that ultimately enhances Atlas' service offerings. The software was

recognized by ASHRAE as a 2016 [AHR EXPO Innovation Award Winner](#) for its ability to perform complex calculations critical to achieving decreased CapEx and OpEx.

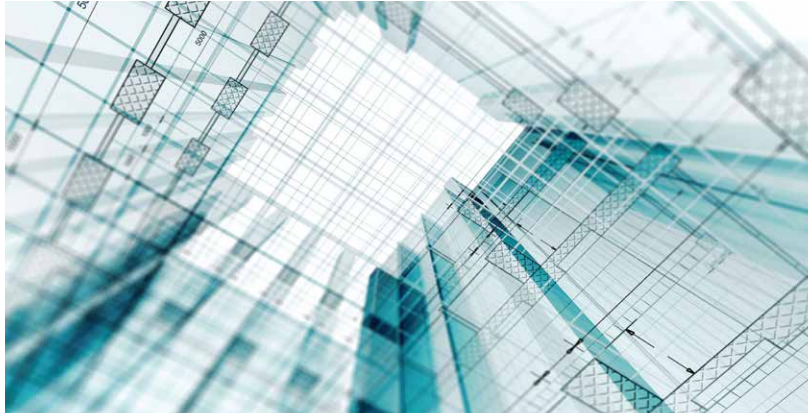
In addition to this innovative approach, Atlas provides an enhanced level of air purification for its customers through the use of Plasma Air's bipolar ionization technology designed to fit any project, regardless of its size or nature.

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## THE RESULTS

Utilizing PlasmaSoft™ software coupled with Plasma Air’s air purification system, Atlas is able to help customers lower capital and operational expenses through a reduction in outside air intake, while simultaneously enhancing energy efficiency and improving indoor air quality. With PlasmaSoft software, Atlas’ commercial, institutional and industrial building developer and owner customers benefit from an easier way to regulate indoor air quality, analyze air contaminant levels and efficiently eliminate airborne pollutants in their buildings.



As Atlas Mechanical Engineer John Bruno explained, “PlasmaSoft is a unique program, unlike anything we’ve seen in the past. It removes all of the guesswork from complex calculations as we attempt to determine system compliance within building architecture, and has been an incredible asset to our company, allowing us yet another way to meet and exceed client expectations.”

“The professionals at Plasma Air are responsive and experienced, offering a comprehensive understanding of industry challenges that has led to the development of a convenient and effective solution for saving money, while generating a healthy and comfortable indoor air environment,” Bruno added.

**Main Street Elementary School - Classroom 123**

ASHRAE 62.1  
Space Contamination Calculations Using Appendix D Equations

**USER INPUT FIELDS**  
Space Contamination Calculations Using Appendix D Equations

Green colored fields need user input. Yellow colored fields are constants provided by Plasma Air.  
Pink fields are auto-calculated based on user selection. Grey values are auto-calculated but also editable.

ASHRAE Equation  
Equation 5 - Filter return air and outside air, Constant Volume Supply Air, Constant Volume Outside Air

Space Type  
Classrooms (age 9 plus)

Ez  
Ceiling supply of warm air 15°F above space Temp and ceiling return: 0.8

Area (Sq.Ft.)  
100

Supply Air (CFM)  
1200

Number of People  
10

Emission Rate / person (µg/min)  
100

Calculation of Space Contaminants Using Ventilation Rate Procedure (VPP) OA

Variable	Description	Value	Units
N	Contaminant Generation Rate	0.320	µg/min
Ez	Zone Air Distribution Effectiveness	0.8	
Vo	Outdoor Air Flow Rate	15,151.20	L/min
Ef	Filter Efficiency	0	
Co	Contaminant Concentration, OA	0.2	µg/m³
R	Recirculation Flow Variable = V/(Vo+V)	0.55	
W	Return Air Flow Rate	18,832.80	L/min
Cbz	Contaminant Concentration, zone	0.969	ppm

Calculation of Space Contaminants Using IAQ Procedure (IAQP) OA

Variable	Description	Value	Units
IAQ Outside Air Rate per Person		0.57	CFM
Space Airflows			
Supply Air		1,200	CFM
Outside Air		178.33	CFM
Return Air		1,021.67	CFM

For constant supply air and constant outside air use:  
 $C_{bz} = \frac{N + E_z V_o C_o (1 - E_f)}{E_z (V_o + R V_r E_f)}$

**PlasmaSoft 2.0®**  
IAQ PROCEDURE SOFTWARE

PlasmaSoft 2.0® calculates and compares contaminant levels using both ASHRAE's VRM and IAQ providing for the reduction of outside air intake enabling commercial institutional and industrial building owners to reduce first cost, lower energy use all while improving IAQ.

- Includes all ASHRAE Standard 62.1 mass-balance equations
- Automatically calculates values for density and outdoor air rates per person and per square foot for all occupancy categories
- Resides in the cloud so users can access their projects at anytime from anywhere
- Password protected to ensure a high level of security



**PLASMA AIR**  
INTERNATIONAL

**Positive Air Quality - Negative Energy Costs**

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