BIG ASS FANS | EXCEPTIONALLY ENGINEERED

AUTOMOTIVE MANUFACTURER PROTECTS TEAM MEMBERS USING CLEAN AIR SYSTEM (CAS)

*The installation of Big Ass Fans (BAF) CAS ion technology on three 30-inch **AirEye** fans in a dense manufacturing work cell provides an average of more than 85k positive and negative ions respectively, reducing occupant infection risk by 85% and providing peace of mind to an essential workforce.*

BACKGROUND:

During the public health conditions brought forth by the COVID-19 pandemic, manufacturing work environments have seen significant changes to mitigate the risk of disease transmission and increase the quality of the overall work environment. In addition to ubiquitous health screenings and social distancing measures, many facilities have installed plexiglass partitions to decrease the risk of droplet transmission between occupants. Continuing to provide thermal comfort, especially during peak warm months with added PPE measures, has to be taken into account when instituting new protocols and guidelines. Reducing heat stress that can pose acute health risks while enhancing and amplifying a focus on air quality is paramount in manufacturing environments. BAF continues to invest in novel airflow solutions through a commitment to researching and engineering unique systems. By using patented products to distribute ions into the occupant breathing zone, BAF can leverage the ions' ability to deactivate pathogens while simultaneously providing cooling airflow and improving thermal comfort without the generation of harmful by products such as ozone.

PROJECT SCOPE:

BAF engineers installed three 30-inch AirEye fans with **CAS** ion technology in a work cell where approximately 10 team members assemble vehicle components. Relevant measurement locations were determined by examining where occupants were normally working in the cell. Testing at three distinct fan speeds (0%, 50%, 100%), BAF engineers measured both positive and negative ion concentrations at each measurement location as well as ozone concentrations to ensure no ozone was being produced by the ionizing equipment. Measurements were taken for 3 minutes for each polarity and fan speed. The reported values are 3-minute averages.

KEY DATA AND OUTCOMES:

The findings of the testing show the ability of the system to deliver significant ion concentrations of both polarities that will have a meaningful germicidal effect in the space. **Average ion concentrations exceeded 85k for both polarities at 100% fan speed (figure 1). Also noteworthy is the fact that zero ozone was detected at any point in the testing window, confirming CAS products ozone free certifications.**

Observed Ion Concentrations Relative to Baseline				
Measurement Location	Baseline - Fans Off		Fans On - 100% RPM	
	Positive Ions x 1000	Negative Ions x 1000	Positive Ions x 1000	Negative Ions x 1000
A	1.6	1.0	56	144
B	2.0	0.2	40	40
C	2.0	0.2	227	74
D	2.1	0.3	67	145
E	1.8	0.4	76	45
F	1.9	0.3	88	68
Average	**1.90**	**0.38**	**92.37**	**85.82**

Figure 1: *Ion Concentrations at various test conditions*

Ion distribution was also generally even as demonstrated by the concentration gradients shown below (figure 2). The true impact of BAF-CAS implementation is a reduction in the infection risk for occupants. This can be modeled using the Wells-Riley infection model, in this case specifically for SARS-CoV-2 with a baseline of 1 outdoor air change per hour from the existing HVAC equipment or natural ventilation, 480-minute occupancy, and one sick occupant in the facility (figure 3). **The results from this model show an 85% infection risk reduction, which means members are more than 6.5 times less likely to become infected in a space with BAF-CAS than with standard HVAC systems alone.**

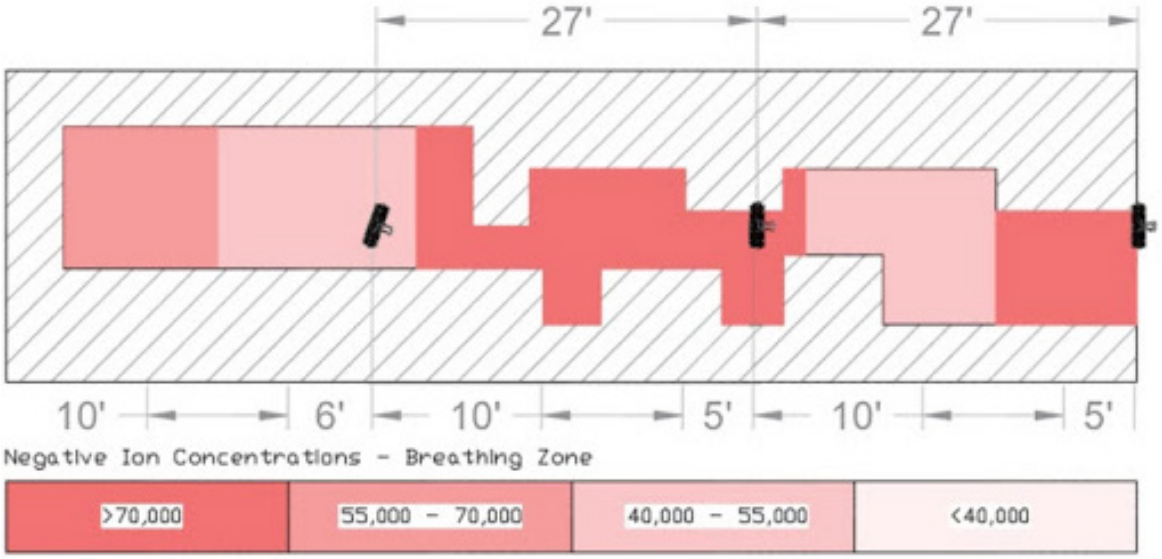

Figure 2: *Negative Ion concentration gradient at 100% RPM*

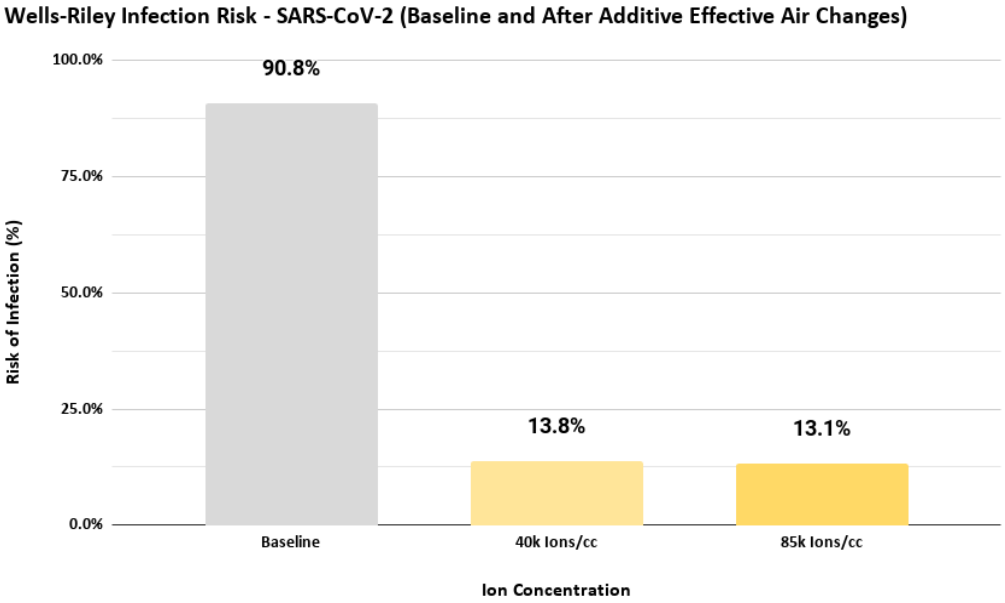

Figure 3: *Wells-Riley Risk Reduction Estimate for 40k and 85k avg. ion concentration compared to baseline*

FURTHER ACTIONS:

The success of the AirEye CAS with ion technology in delivering a high concentration of ions to the entirety of a manufacturing work cell showcases the capabilities of the system and demonstrates to employees the company is both providing a means of safety and comfort. The skilled manufacturing labor market remains tight and competitive between companies in many areas of the world. Demonstrating investment in team member safety and comfort is invaluable in both attracting and retaining your organization's most valuable asset: essential skilled labor employees.