Real-World Particulate load reductions

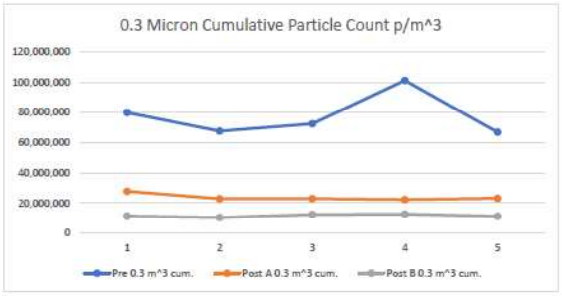
To understand the true effectiveness of an air purifier, you must perform pre and post-installation testing to obtain quantifiable results of the true reduction of the overall particle load. The results below were obtained from three different site locations with installed Halo air purifiers, all within the commercial sector during normal working conditions. The results are for particles between 0.3*µm & 0.5 *µm in diameter (full reports available upon request), which are the particles that pose the greatest health risks as they are not filtered by our bodies naturally and therefore when breathed in, they enter deep into our lungs causing both short term and long-term health effects. These particles could either be viable (contains more than one living microorganism) or non-viable (does not contain a living organism but is a transporter for viable particles). An example of a viable particle would be mold, bacteria, and aerosolized viruses.

Reducing loads of these particles is critical to improving indoor air quality and mitigating our risk of aerosolized viral transmission and general Sick Building Syndrome (SBS). Simply put, the more we can reduce the particle load, the healthier our air will be.

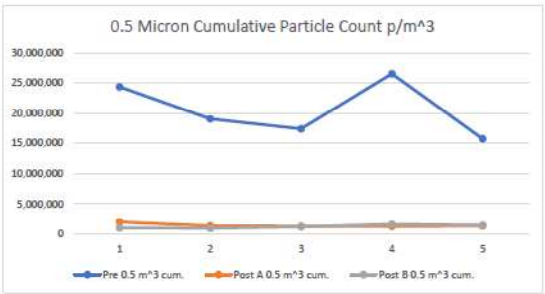
***microns**

Moe's Southwest Grill – 3 Halo's – 10,000 cu' of air volume treated

Spot	Pre 0.3 m^3 cum.	Post A 0.3 m^3 cum.	Post B 0.3 m^3 cum.	Average % Reduction
1	80,089,080	27,822,034	11,288,413	75.58%
2	67,734,192	22,853,316	10,372,009	75.47%
3	72,621,696	22,943,842	12,343,683	75.70%
4	101,146,704	22,335,500	12,657,747	82.70%
5	67,056,672	23,206,992	11,275,507	74.29%

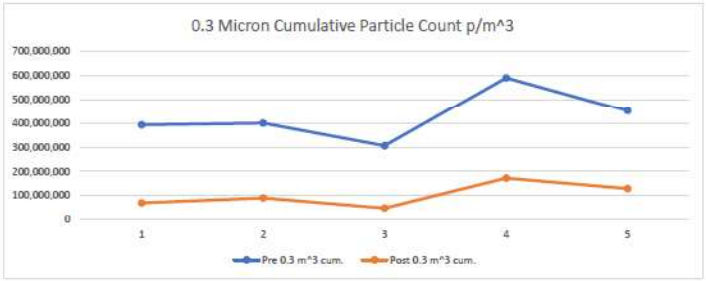


Spot	Pre 0.5 m^3 cum.	Post A 0.5 m^3 cum.	Post B 0.5 m^3 cum.	Average % Reduction
1	24,371,866	2,003,283	1,036,363	93.76%
2	19,064,512	1,355,532	966,218	93.91%
3	17,405,010	1,280,583	1,213,392	92.84%
4	26,546,354	1,271,849	1,617,934	94.56%
5	15,755,978	1,327,436	1,468,415	91.13%

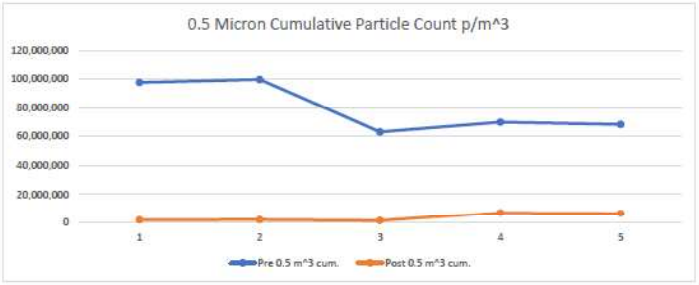


Off the Vine Restaurant – 4 Halo's – 15'000 cu' of air volume treated

Spot	Pre 0.3 m^3 cum.	Post 0.3 m^3 cum.	% Reduction
1	392,789,696	69,686,744	82.26%
2	399,868,608	89,989,168	77.50%
3	306,027,904	47,617,296	84.44%
4	591,211,136	172,218,896	70.87%
5	451,924,928	129,086,648	71.44%

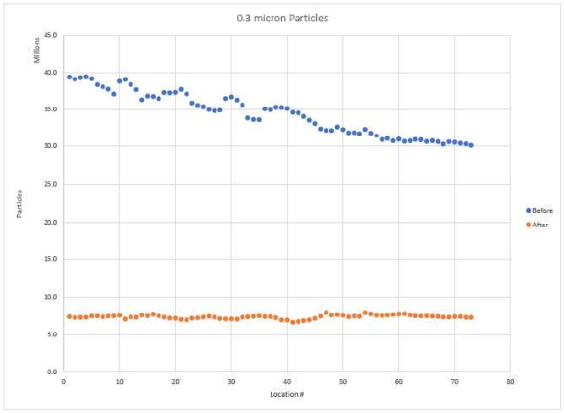


Spot	Pre 0.5 m^3 cum.	Post 0.5 m^3 cum.	% Reduction
1	97,898,832	1,796,365	98.17%
2	99,914,448	1,904,174	98.09%
3	63,259,952	1,354,662	97.86%
4	70,090,904	7,086,075	89.89%
5	68,507,760	6,736,390	90.17%

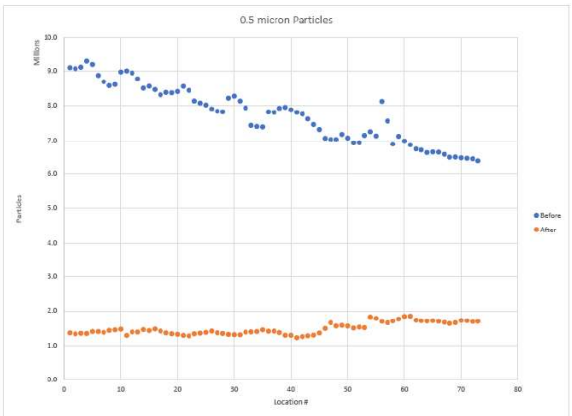


WSS (shoe warehouse/store) – 8 Halo's – 186,000 cu' of air volume treated

PARTICLE COUNT CHART: 0.3 MICRONS



PARTICLE COUNT CHART: 0.5 MICRONS



Understanding how room cleanliness is determined

Room cleanliness is monitored by Pharmaceutical, medical device, and semiconductor companies to ensure the integrity of their products is not compromised during manufacturing. These manufacturing areas are classified by what is known as cleanroom or controlled environments and start with ISO 1 (sterile) up to ISO 8 (controlled). The classification depends upon the total particles detected during air sampling procedures. The goal in these environments is to remove or reduce viable and transporter (non-viable) particles, reducing the risk of product fallout or cross-contamination. What is very impressive here is that based on the particle counts presented in the results of the above tests, we have achieved ISO 8 cleanliness in all three scenarios. Again, by reducing the particle load, we are mitigating the risk of harmful exposure to pollutants unseen to the human eye, dramatically improving the air we breathe.

Class	Maximum particles/m³ [a]						FED STD 209E equivalent
	≥0.1 µm	≥0.2 µm	≥0.3 µm	≥0.5 µm	≥1 µm	≥5 µm	
ISO 1	10[b]	d	d	d	d	e	
ISO 2	100	24[b]	10[b]	d	d	e	
ISO 3	1,000	237	102	35[b]	d	e	Class 1
ISO 4	10,000	2,370	1,020	352	83[b]	e	Class 10
ISO 5	100,000	23,700	10,200	3,520	832	d,e,f	Class 100
ISO 6	1,000,000	237,000	102,000	35,200	8,320	293	Class 1,000
ISO 7	c	c	c	352,000	83,200	2,930	Class 10,000
ISO 8	c	c	c	3,520,000	832,000	29,300	Class 100,000
ISO 9	c	c	c	35,200,000	8,320,000	293,000	Room air

[a] All concentrations in the table are cumulative, e.g. for ISO Class 5, the 10 200 particles shown at 0,3 µm include all particles equal to and greater than this size.

[b] These concentrations will lead to large air sample volumes for classification. Sequential sampling procedure may be applied; see Annex D.

[c] Concentration limits are not applicable in this region of the table due to very high particle concentration.

[d] Sampling and statistical limitations for particles in low concentrations make classification inappropriate.

[e] Sample collection limitations for both particles in low concentrations and sizes greater than 1 µm make classification at this particle size inappropriate, due to potential particle losses in the sampling system.

[f] In order to specify this particle size in association with ISO Class 5, the macroparticle descriptor M may be adapted and used in conjunction with at least one other particle size. (See C.7.)