NQ® PARTICLE REDUCTION TEST

NQ Clarifier Standard (2 UVC lamps) – July 2004

Objective: Air Purification System simulated test to ascertain the actual particulate reduction capability of the NQ Clarifier Standard 2 lamps unit. Two tests were run.

Procedure: Particle loading of 0.3 micron particles to 2.58 x 10^6 ppm (particles per m^3) in the test room, unit turned on and the actual testing commenced at 10:15 AM, particulate counts were taken as shown over a 24 hour period.

Discussion: The meter used was a MET ONE # PCM 228 .3 which measures the number of 0.3 micron particles in the air test sample with an on board air pump, drawing air across an infrared scanning test chamber for accurate counting of sub micron particles.

Test 1 : Non-airtight test room

The simulated room size that the test was conducted for was 3,96 m x 4,57 m with a 2,74 m ceiling (13'x15'x9') – volume of 50 m^3/1755 ft^3, which then relates to 12 air changes per hour for an air volume of 595 m^3/h or 350cfm delivered by the NQ Clarifier at boost speed.

The room air was allowed to exchange via door cracks and normal building construction cracks so as to assure as close to real life as possible. The initial loading was to establish an extreme starting condition so as to assure a complete reduction of all particles in a normal residential or office environment.

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UV-Air Purification Systems

The table below tracks the actual particle counts of 0.3-micron particles.

Time	Particule count	Test duration	Removal rate
10:15	2,580,000 ppm	N/A	N/A
10:20	2,180,000 ppm	5 minutes	80,000 ppm/min
10:25	1,720,000 ppm	10 minutes	92,000 ppm/min
10:30	1,070,000 ppm	15 minutes	130,000 ppm/min
10:45	823,000 ppm	30 minutes	16,000 ppm/min
11:00	740,000 ppm	45 minutes	5,533 ppm/min
11:30	598,000 ppm	1 h 15 min	4,733 ppm/min
12:00	465,000 ppm	1 h 45 min	4,433 ppm/min
1:00	455,000 ppm	2 h 45 min	166 ppm/min
3:00	436,000 ppm	4 h 45 min	158 ppm/min
5:00	420,000 ppm	6 h 45 min	133 ppm/min
10:15	334,500 ppm	24 hours	81 ppm/min

TOTAL: 2,245,500 ppm de REDUCTION after 24 Heures

CONCLUSION: **Particle removal is at the 80% level after just 1.5 hours** and at **87% after 24 hours**, this rate is highly successful because the continual simulated loading equates to a very poor environment. The problem particles for most people are in the over 1 and up to a 10 micron range. The NQ Clarifier is equipped with an HEPA filter H13 (99.97% efficiency at 0.3 micron), we have chosen to do this test on particles of 0.3 micron because a 0.3 micron test is the most stringent of all particle tests. A test on this particle size is more significant than making it on particles of 1 to 10 microns (an HEPA filter is more efficient to filter particles > 0.3 microns).

For information IAQ standards for particulate levels in living spaces are under 450,000 ppm which means that with the use of an NQ Clarifier Standard theses standards can be achieved even in extreme conditions as demonstrated in this test.

Test 2 : Airtight test room

A control chamber was then run in a similar manner except it was closed to any infiltration of particles for the testing period. An 2,44mx 2,44m x 2,13m (8'x8'x7') plastic room was used. The room started at 1,770,000ppm and went to 18,000ppm in 20 min. **Counts went to 100ppm in 45 min. which means a 99.99% reduction.** The meter fluctuated readings between 100ppm and 0 after 1 hour.

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