

AC1500 HEPA/UVC Air Purifier Unit

INTRODUCTION

The Filtrex AC1500 unit has been proved by exhaustive laboratory tests and in numerous applications in the field to provide effective containment of contaminants and create clean room environments. This is achieved by the inclusion of high efficiency filtration, air handling capacity to generate high air purification rates in the area served and a distribution designed to achieve complete disturbance or “scavenging” of the space.

FILTRATION GRADE

The unit incorporates a grade H14 HEPA filter contained in a sealed mounting with facility for field testing of the integrity of the filter and seal. The normal rating of the filter is related to a particle size of 0.3 microns.

The following table shows that, in practice, tests have proved that filtration efficiency is maintained or even enhanced with particle sizes down to 0.06 microns. This ensures that all particles drawn into the unit are removed from the air stream.

Particle size [µm]	Efficiency [%]	Efficiency, 95% min [%]	Penetration [%]	Penetration, 95% [%]
0,060	99,9995	99,9992	0,001	0,001
0,070	99,9988	99,9985	0,001	0,001
0,081	99,9982	99,9979	0,002	0,002
0,093	99,9975	99,9972	0,003	0,003
0,108	99,9968	99,9966	0,003	0,003
0,124	99,9963	99,9960	0,004	0,004
0,143	99,9959	99,9957	0,004	0,004
0,166	99,9961	99,9959	0,004	0,004
0,191	99,9966	99,9964	0,003	0,004
0,221	99,9975	99,9974	0,002	0,003
0,255	99,9987	99,9986	0,001	0,001
0,294	99,9993	99,9991	0,001	0,001

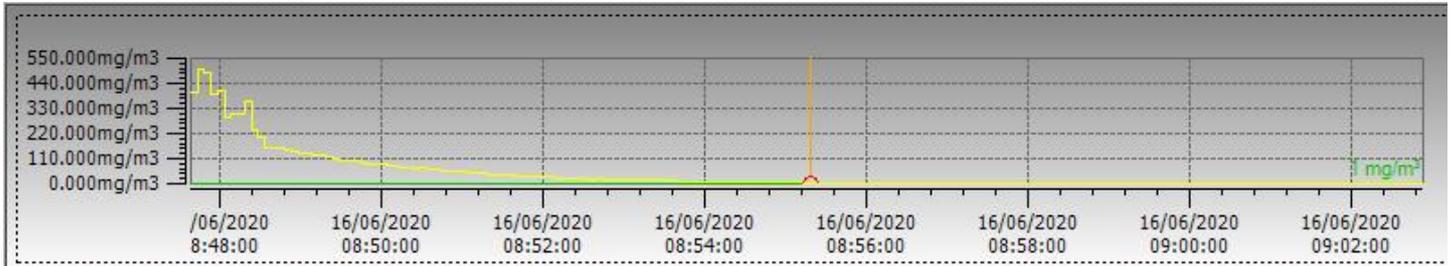
ROOM PURIFICATION RATE

A critical element in the achieving of clean room conditions is the air purification rate created in the space under consideration. Depending on the degree of contamination or the speed at which the purification is to be achieved air purification rates of between 6 per hour and 35 should be established. This can be set to suit the specific room requirements.

The unit handles up to 1500 cubic meters per hour with speed control to reduce as appropriate to the application. An airflow monitor is incorporated which gives continuous and visual display of air volume.

A field test was carried out in a room with a volume of 60m³. Smoke particles were introduced until a particle concentration of 500mg.m³ was indicated on the measuring instrument. The unit was switched on, complete circulation within the space was achieved, after 2 minutes particle concentration fell to 100 mg/m³ and to a negligible level after 6 minutes.

The following trace resulted from the test.

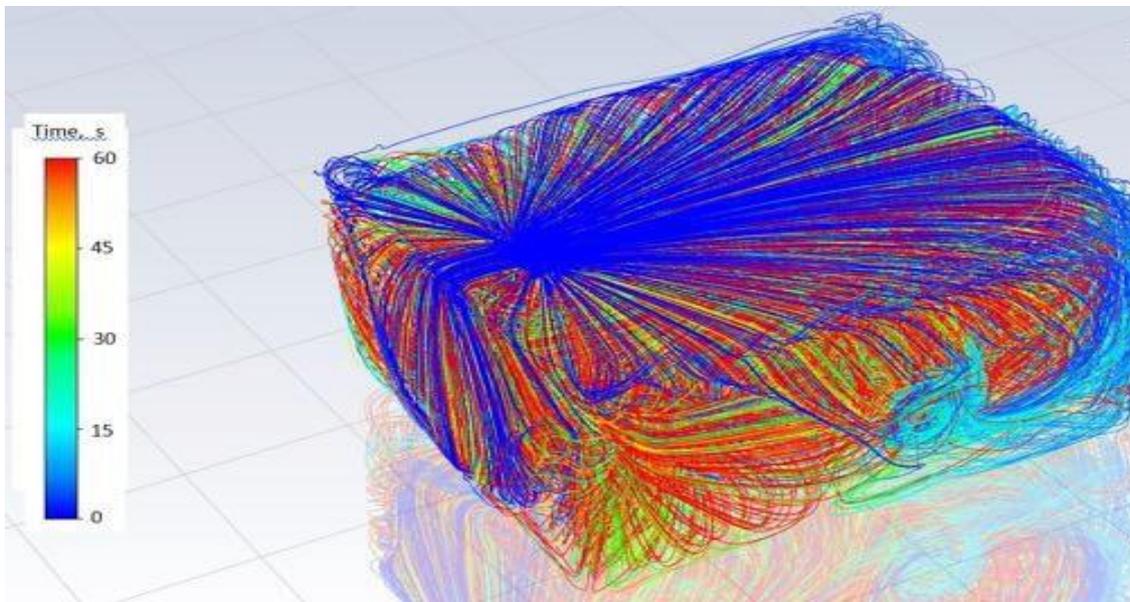


AIR CIRCULATION

It is important that in addition to establishing an appropriate air change rate, supply air discharge and recirculation design is such that rapid disturbance of air throughout the space is achieved.

Full Computational Fluid Dynamics (CFD) tests were carried out with an AC 1500 unit in a room of 50 m³ volume demonstrated that clean air supply reached ceilings and walls within 2 seconds and the whole space within 60 seconds.

A typical image from the test data follows.



CONCLUSION

From the foregoing review it is evident that the combination of high filtration efficiency, high and variable air flow, UVC lamp protection and carefully designed air supply and recirculation arrangement has contributed to achieving a highly effective and compact air purifying unit that lends itself to many applications including clean rooms, ICU's, reduced fallow time in dental and medical surgeries, enhanced protection in general work environments and many others.