

Machine effective service area with number of Air Change Per Hour (ACH)

Machine effective service area is easy to be understand and assume that the max. area of the machine can serve for. Most of the manufacturer will tell us the recommend, effective, or maximum services area of the machine, then we can choose the suitable machine which can cover our existing area needed to be purified. BUT, most of them will never explain how their area figure come out, at least how many air change per hour of the machine can be provided when under their suggested area?

Air Change Per Hour (ACH), which term is commonly be widely used in most centralize HVAC system to calculate the sufficient fresh air supply, return or exhaust of pollutant air in the system, e.g. 3 – 5 number of ACH is widely applied in most of the HVAC system in office area etc. Then, we can think about if an air purifier can not provide at least 3 – 5 number of ACH in our area, the machine can still fully purify the polluted air before we breathe or exhausted by the HVAC system? Answer is NO. So, 5 number of ACH of the machine provide is the minimum requirement for our consideration. A simple mathematical question e.g. a machine state their effective area up to 500ft.2 with under 3 ACH, then we should use the machine in an area never over 300ft.2 ($500\text{ft.}^2 \times 3/5 = 300\text{ft.}^2$), because the machine use at 300ft.2 will provide 5 ACH bow.

Actually, there is a regulation for centralize HVAC system design, different environment is designed with different minimum number of ACH provide, so we should check out our

existing number of ACH of our HVAC system, then we can estimate the actual capacity of the air purifier we need.

For home case, we're apologize that there is no any regulation or reference that we can follow till now, so we just can suggest we can assume 5 number of ACH should be our consideration.

Note: number of ACH is only can be applied on the machine theory by "Passive Type" or "Filtering Type" means the machine draw a pollutant air pass through their filtration filter inside the machine and blow out the purified air back into the room finally e.g. most common machine with HEPA or Carbon filter, UV Lamp etc..., their filtration process is totally inside the machine. For a machine with theory of "Active Type" E.g. Plasma Ion Generator (+/-) Ion, number of ACH should not be applied on such kind of machines because their air purification process is outside the machine (the ambient air inside the room).

