

99.97% better than 99.96%? Or 99.999% better than 99.97%?

Most user will concern the efficiency of the air purifier when they go to evaluate and compare with different machines. Of course, the efficiency is one of our consideration point to determine our decision, but we should explain that is not really right, why? Few manufacturer will emphasis their machine efficiency can meet 99.97% or 99.999 % to attract user to use their products, but how many user will know that is really important or suitable for their actual application? When there are two machines with 90% and 99.999%, their air flow delivery capacity is same can provide 5 ACH, then these 2 machines applied into 2 different room with same environment conditions, the purification result may be "Same" after an hour operated. The reason is despite the machine with just 90% efficiency, the final remove efficiency of this machine will be $100 - 100 \times 0.1 \times 0.1 \times 0.1 \times 0.1$

$\times 0.1 = 99.99999\%$ after an hour (5 ACH). Of course, there should be different factors may affect the result under an actual environment, that's a simple but truth calculation that we can as a reference. Remember that we always use an air purifier may over an hour a day, then shall we still need to concern the figure 99.97% is better than 99.96% or looking for any machine with 99.99% should be the best for me?

Many field test has been proof that despite a machine with only 90% or 9x%, if their air flow delivery is larger than a machine with 99.99% or 100% (zero leakage), the final result proof that it may better than the claim 100% (zero leakage) one.

We are not means we should not consider the efficiency, we just want to let user to consider their actual usage and environment, machine

with 99.97% is must for us? If we need to pay a higher and higher cost to buy a machine with zero leakage BUT we know the final result may be same, shall we still consider the machine for our application? We can suggest or conclude that if our application area or room is under control as like as a hospital ICU which needed to prevent any accident of bacteria & virus leakage outside, we may have point to consider to install the filter into the HVAC system for one pass filtration purpose or the machine should have 99.99% efficiency but direct used by the patient close to her face only. Otherwise, it may also meaningless especially for whole room purification purpose.

Also, we should explain that may be most of the manufacturer claim their machine provide 99.97% efficiency for 0.3 micro-meter particles, they just direct put the figure from international standard requirement of HEPA 99.97% of 0.3um, we should go through their actual machine testing report as reference because we are not going to buy the machine filter only, we need to use the whole machine, so the machine filtration efficiency should be the one we need to concern.

Anyway, we need to consider the machine efficiency, but please no need to focus on such few % different especially for our normal application purpose and never be under controlled actual environment conditions.

