



LABORATORY TESTING REPORT

Design experience includes projects with:



PurafideTM H13 HEPA Filter Particle Testing

Summary

HEPA Filter Life Study, 29 July 2021

Quantify the effective life of Purafide’s Extended Life H13 HEPA filters for cleaning the air. We tested an air purifier that had been in constant use for two years. It is clearly effective; its performance is comparable to an air purifier with a new filter.

Next, we loaded a Purafide XP280 Air Purifier HEPA filter with over 29g of dust and the filter performed as well as the trial with a new filter. These experiments indicate that the Purafide Extended Life H13 HEPA filter particle removal effectiveness will last a full two years.

Experimental Procedure

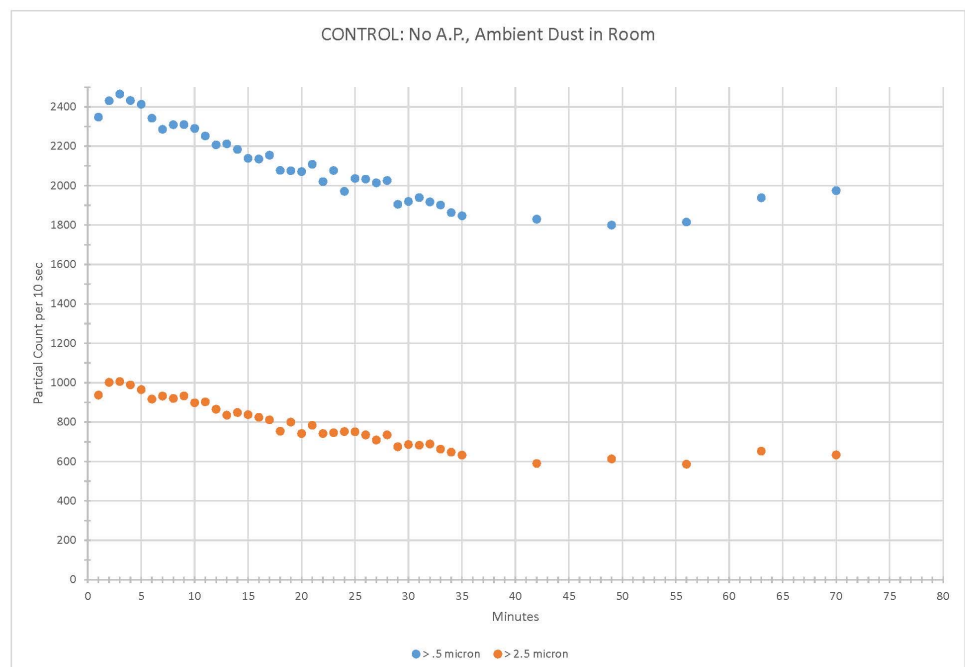
As a control, the lab agitated dust in a room and measured the particles with a Dylos DC 1100 Pro particle reader over a 65-minute period. Then, ran an air purifier with a HEPA filter that had been in constant use over a 2-year period to compare with the control trial.

Next, we ran a Purafide XP280 with a new Extended Life H13 HEPA filter in the room under the same dusty conditions. Finally, to simulate a very dirty filter, we loaded the filter with talcum powder and ran it in the dusty room to compare it with the previous trials.

This graph shows dust levels in a room with no air purifier.

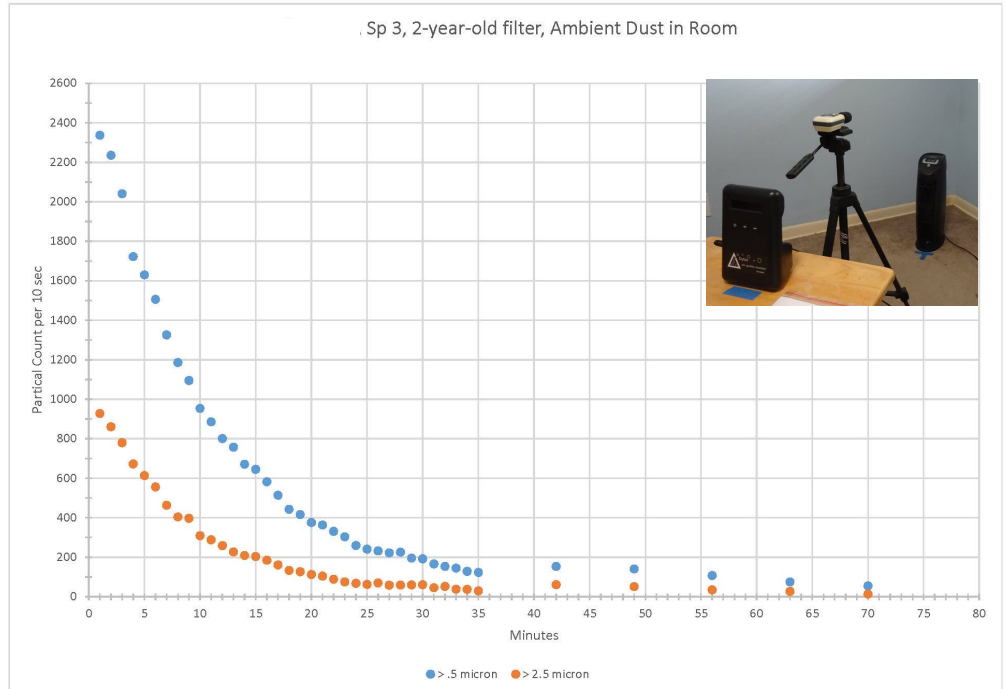
Small particles varied but did not drop below 1800 count. Large particles stayed above 600 count.

For clean air, we would want both large and small particles to be in the double or single digits; much lower than we see here.



In this trial, we ran an air purifier with a two-year-old filter that had been in constant use. In contrast to the previous chart, the dust levels dropped rapidly. Large particles reached a low in the double digits starting at 23 minutes and small particles went below 100 count at around an hour.

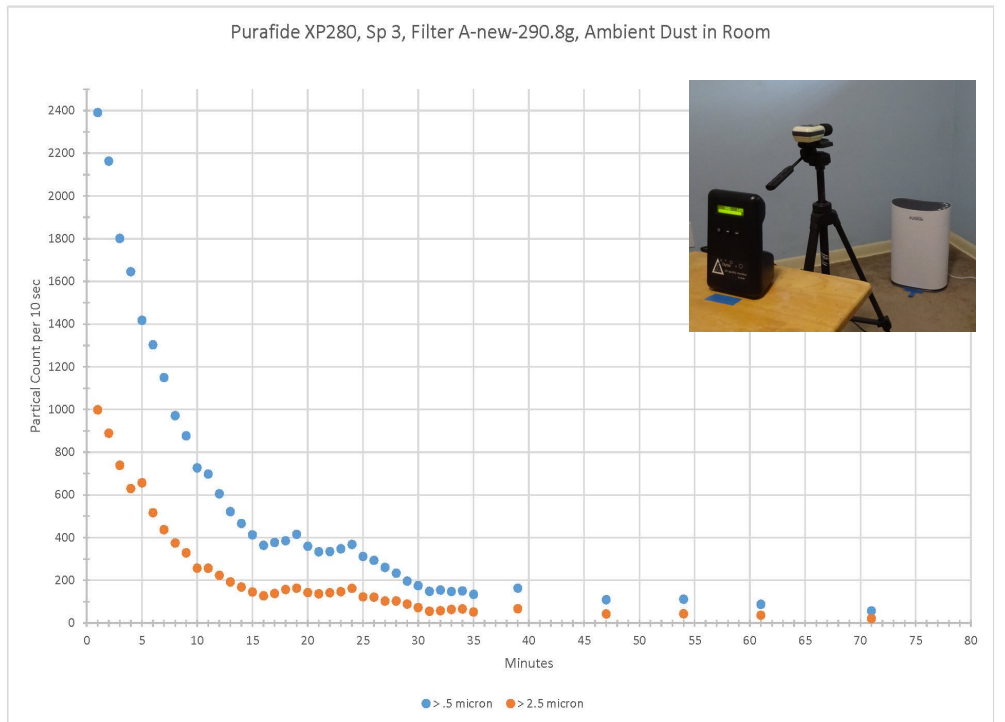
This HEPA filter is still effective at cleaning the air after two years of constant use.



← Note dust and build-up on the filter

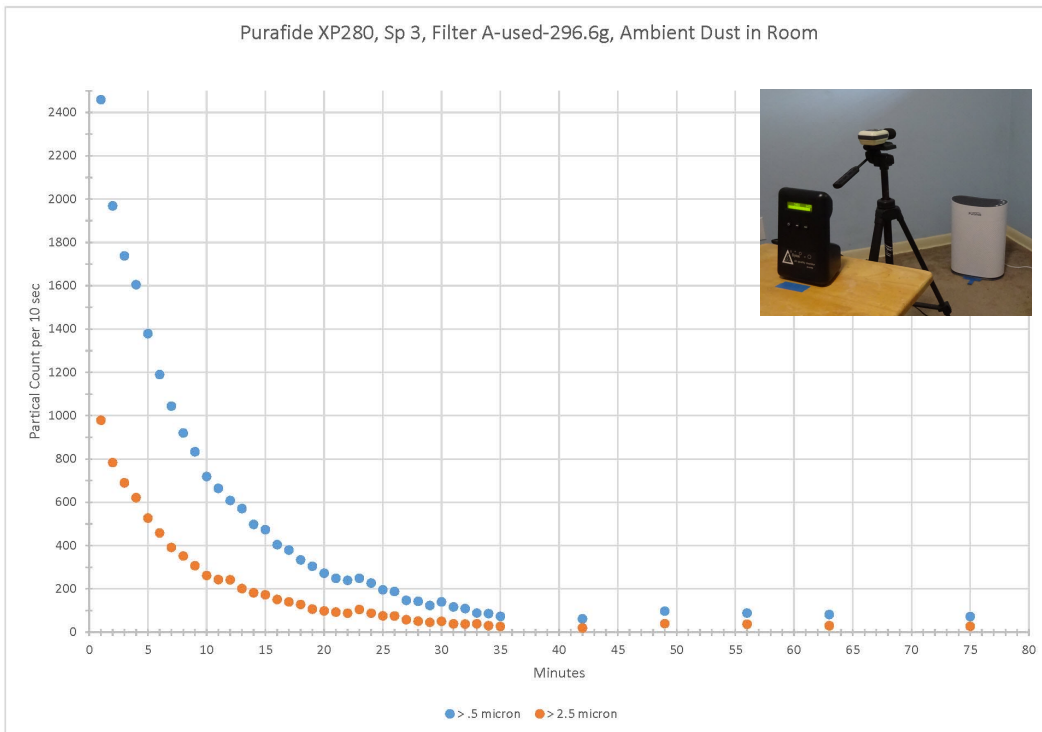
In this trial, we ran a Purafide XP280 air purifier with a new Extended Life H13 HEPA filter in the dusty room. Large particles dropped below 100 at 29 minutes and small particles dropped to double digits at about an hour.

This air purifier with a new HEPA filter is effective at cleaning the air.



In this trial, we loaded the Purafide filter with 5.8g of dust by sifting talcum powder into the filter as it was running. This represents a moderate level of contamination.

This trial reached low levels of dust in the room slightly faster than the previous trial that had a new filter.

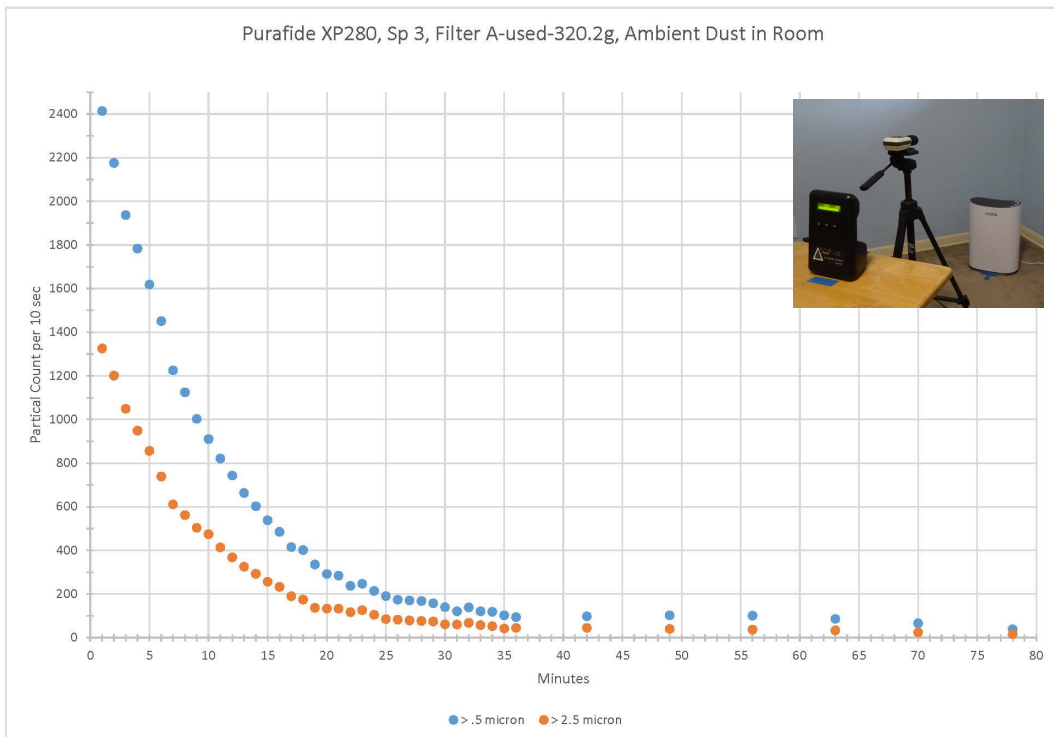


This filter was loaded with 5.8g of dust.

In this trial, we loaded the Purafide filter with 29.4 g of dust. This represents a very high level of filter contamination. With this amount of dust, a significant amount rests on the surface and in the folds of the filter.

About the 20-minute mark, this dirty filter matched or exceeded the performance of the less used filters.

This very dirty Purafide HEPA filter is still effective at cleaning the air in the room.



This very dirty Purafide HEPA filter is still effective at cleaning the air in the room.

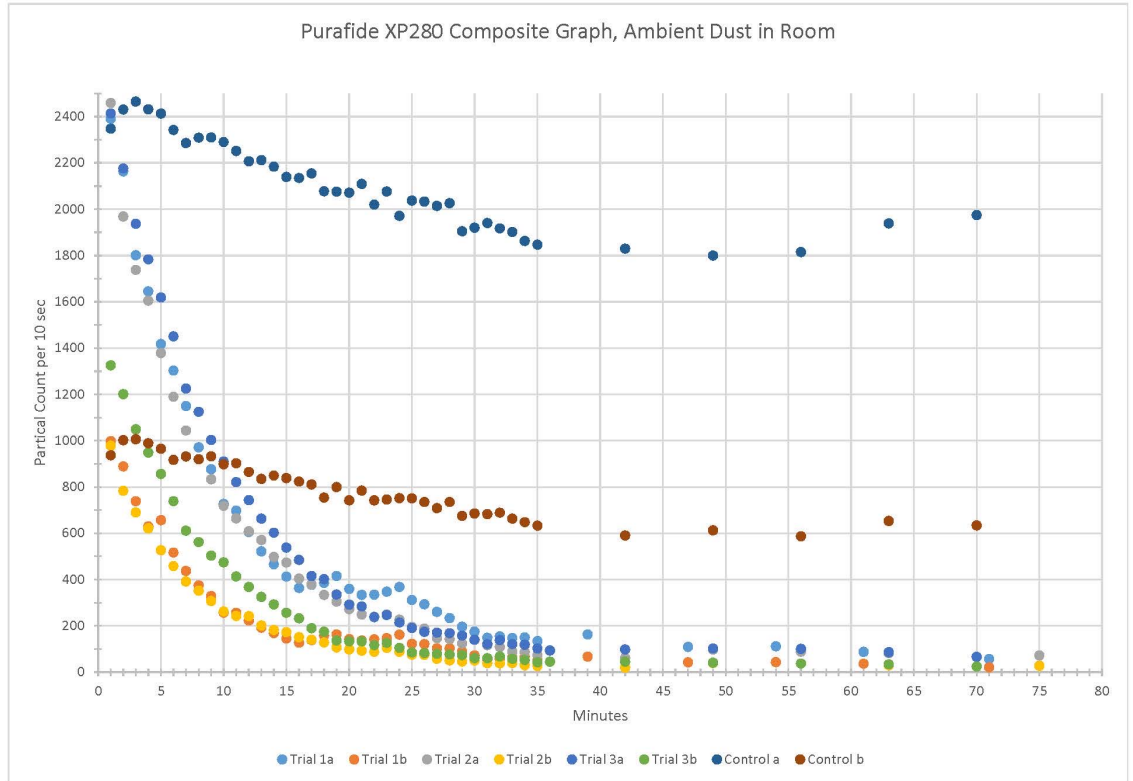
This filter was loaded with 29.4g of dust. This represents a heavy amount of loaded dust. Far exceeding real world conditions.

This graph shows the 3 Purafide trials together with the control data.

The dust levels stayed high when there was no air purifier running as shown by the control data.

The 3 Purafide Extended Life H13 HEPA filters performance remained consistent regardless of how dirty they were.

They reached clean levels at about the same time.



(From 45 minutes on, there are graph markers on top of markers; for that reason, all trial data points are not visible)

a = particles > .5 micron
b = particles > 2.5 micron

Conclusion

The lab testing results indicate a Purafide Extended Life H13 HEPA filter can be effective even after it has collected a heavy amount of dust. In fact, the final trial showed that the HEPA filter continued to be as effective with as much as a 10% weight gain of contaminating dust particles.

Furthermore, the lab testing trials indicates that Purafide Extended Life H13 HEPA filters can still be effective in air particle capturing and containment after 2 years of constant household use.