

Report Summary – Excerpted from an article originally published in *Filtration & Separation Magazine*, April 1999

THE EFFECT OF PREFILTERS ON THE PERFORMANCE OF HEPA FILTERS

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Purpose

The purpose of the study was to determine the amount of particulate reaching the HEPA filter with and without a prefilter and the effect on pressure drop, filter cost and volume of waste disposal.

Filters

Prefilter - 25 – 30% Pleated Panel Filter
HEPA Filter – 99.97% on 0.3 Microns

Methodology

A series of four (4) tests were conducted by feeding dust particles of a known size at a constant flow rate into the HEPA filter without a prefilter and repeating the process with a prefilter / HEPA filter combination.

HEPA Only Test – Dust was fed until resistance reached 3.0” W.G.

Prefilter / HEPA Filter Combination – Dust was fed until the pressure drop across the prefilter / HEPA filter combination reached 3.0” W.G. At that point a clean prefilter was installed and the test resumed. This procedure was continued until the insertion of a clean prefilter did not reduce pressure drop below 3.0” W.G.

Findings

In all tests it was concluded that the life of the HEPA filter was extended by the use of a prefilter.

In general, four (4) prefilters were used before the HEPA filter reached the final resistance of 3.0” W.G.

Analysis of the dirt collected on the filters showed the prefilter removed the larger, coarser particles causing a smaller average particle size to reach the HEPA filter and a reduction in the amount of dirt loading deposited on the HEPA filter.

Conclusions

Average Life Extension of HEPA	Average Cost Savings (Filter Cost Only)	Reduction in Waste Volume to be Disposed
72%	26%	30%