

Air Filtration & Total Cost of Ownership

“Destination” Mall Reduces HVAC Labor 68% and Benefits from Substantial Savings in Labor and Landfill Waste

Company Profile:

A multi-story retail shopping mall with more than 400 stores, widely known as one of America’s top visitor attractions.

The Situation:

Facility management was under a directive from corporate owners to reduce operating costs in all areas. Labor and waste disposal were primary areas targeted for reduction.

The mall’s HVAC system is equipped with over 32 built-up “pent-house” air handlers supplying a total of over 3,000,000 CFM. The AHUs employed two-stage filtration with a pleated prefilter and a synthetic media rigid box final filter in a combined filter bank. More than 3000 filters were in service throughout the mall’s rooftop AHUs.

Mall managers explored various air filtration options, looking first at straight “purchase cost.” This presented Camfil the opportunity to demonstrate how the Hi-Flo® ES pocket filter could produce significant bankable savings far beyond what would be realized by simply changing to lower cost filters.

The Action:

Since the mall had prefilters and final filters in the same bank, it was an excellent opportunity to upgrade to the Hi-Flo ES that doesn’t require a prefilter and eliminate the existing prefilters. Camfil performed a Life Cycle Cost analysis (LCC) to compare the total cost of ownership of the existing filter arrangement vs. the Hi-Flo ES.

The LCC modeled both filtration configurations analyzing performance and cost. The data clearly stated that converting to the Hi-Flo ES one-stage filtration not only eliminated cost of a filter, but would eliminate significant labor costs including installation, handling, storage, and disposal. Landfill waste would also reduce substantially.



The Result:

The tested Hi-Flo ES MERV 13 maintained its rated efficiency throughout the analysis and by eliminating the prefilter, the average pressure drop reduced by .09" w.g. The previous rigid box filter, however, had a MERV 13 rating at installation, but because synthetic media decreases in efficiency over its life, the final MERV-A rating was only a MERV 10.

Camfil representatives presented mall management with documentation identifying substantial overall savings in the operation and maintenance of the system using the Hi-Flo ES. The most significant savings was 68% of total labor hours.



“There was 84% less waste, reducing dumpster space by two-thirds.”

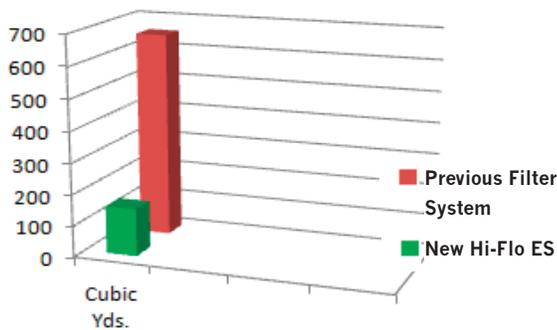
The Proof:

Waste and Disposal

Upgrading the final filters from a rigid metal box style to the plastic frame Hi-Flo ES dramatically reduced waste disposal costs. The existing box filters had to be discarded whole into a dumpster, which used a large volume of space; several dumpsters were required for each change-out. The fully incinerated Hi-Flo ES folded down so the disposal space needed was minimal.

Discarded into dumpsters, 700 Hi-Flo ES filters fit into a 30 cubic yard dumpster. This was a big difference from the 220 rigid box filters in the same space. The Hi-Flo ES required only 31% of the space filled by the box filters. This meant only 1/3 of the number of dumpsters were needed.

Waste/Landfill Reduction



Labor

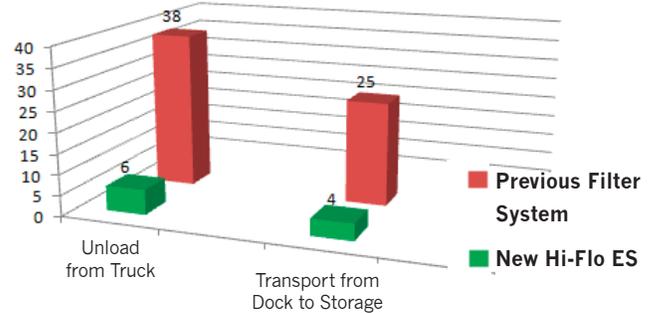
With the previous filters, the labor costs were significant due to the long distances the maintenance staff had to walk within the shopping center and across the expansive roof to deliver new filters AHUs. In addition, workers had to transport the old filters, plus the empty boxes and packing material from the new filters, to the central disposal point outside the building at ground level.

The lightweight Hi-Flo ES was an easier to carry, less bulky solution compared to the heavy rigid box filters. The Hi-Flo ES packaging included two filters per box and a handle. This allowed for one person to carry four boxes simultaneously, for a total of eight filters in one trip. The rigid box filters could only be carried one or two at a time.

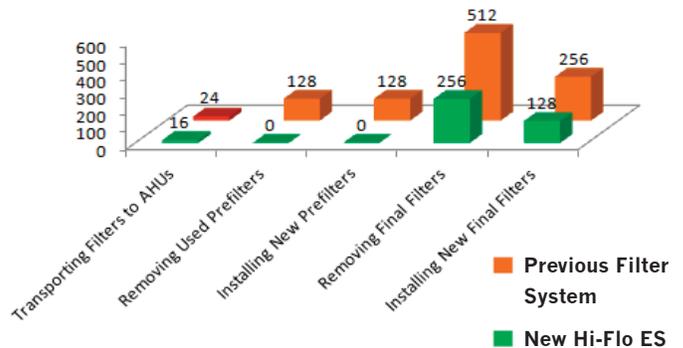
The Hi-Flo ES filters were shipped on pallets (vs. previously the rigid filters in boxes) which reduced unloading time by more than half. The size of the crew was streamlined from twelve to six.

Logs were maintained throughout the test to document the total labor savings realized through elimination of all of the operations involved in using the prefilters and in upgrading to the Hi-Flo ES.

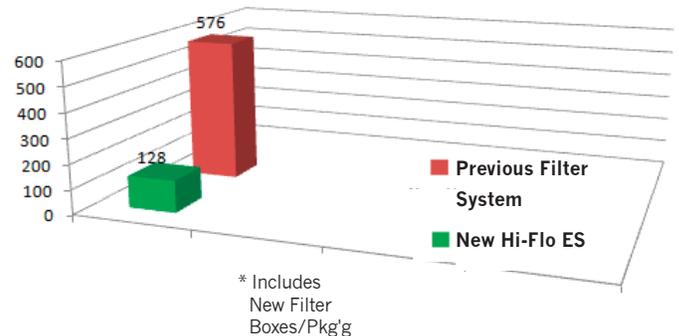
Initial Filter Handling - Labor Hours



Changing Filters - Labor Hours



Transporting Used Filters To Disposal Point - Labor Hours



**Total Labor Hours Saved Over Three Years:
1149 Hours = 68%**