

## Air Filtration - Total Cost of Ownership

### International Airport Solves Chronic Maintenance Issue and Lowers Total Cost of Ownership

#### Company Profile:

One of the nation's leading international gateways, operating more than 80 airlines and serving over 46 million passengers annually.

#### The Situation:

Inadequate airflow was causing severe maintenance and cost difficulties for the engineering firm operating the major airport. Extremely high dust levels from airplane exhaust required that the firm spend an inordinate amount of time and money changing the pleated air filters in the make-up air intakes. Trials with competitive filter products that offered short-term advantage of low initial cost had failed. Low-cost pleated filters and inferior quality 4V final filters failed prematurely and gained resistance at an unacceptably high rate. Earlier trials resulted in system contamination with no improvement in airflow.

The process of changing filters and constantly adjusting air flow rates was a significant cost burden in terms of material, labor, inventory, and logistics. Faced with rising costs and maintenance personnel demands, it was acknowledged that a long-term solution was needed to reduce air filter lifecycle costs, while achieving consistent, high airflow rates through lower system resistance.

#### The Action:

Camfil Farr was invited to evaluate the situation and offer recommendations. A Life Cycle Cost analysis using Camfil Farr's proprietary LCC Green Software determined converting from two-stage filtration to single-stage using Camfil Farr's Hi-Flo ES bag filters would substantially improve both airflow and filter life. The conversion from the current 2" pleated pre-filter and 12" V-bank final filter combination to a single-stage, 30" unsupported filter would require only minor field modifications using Camfil Farr fasteners.

To document performance, Camfil Farr agreed to a side-by-side in-situ study. Two filter combinations were tested. A 2" Flanders pleated



pre-filter with a 12" V-Bank Yatair was tested against the 30" Hi-Flo ES. Camfil Farr agreed to test sample filters at the Camfil Farr lab per ASHRAE Standard 52.2-1999. The test criteria included contaminant removal efficiency (system cleanliness), contaminant holding capacity (service life), and airflow resistance (pressure drop).

#### The Result:

Hi-Flo ES substantially outlasted the competitive combinations. The test results showed a 50% longer filter life and a greater than 300% improvement in system airflow. The longer filter life translated into less frequent filter changes and a material reduction of two-thirds. The constant manual airflow adjustments were also eliminated which allowed staff to pursue other tasks. In addition, the streamlined Hi-Flo ES design required less storage space, allowed for filter changes to be performed more quickly, and reduced waste significantly.



**“The filter life was extended by 50% and airflow improved by over 300%.”**

**The Proof:**

Side-by-side comparison of material, storage space, and waste: The Hi-Flo ES filter uses less than one-third of the material, requires less than one-third of the storage space, and produces less than one-third of the waste compared to the 2" Flander/12" Yatair V-Bank filter combination.



2" Flanders & 12" Yatair  
after 4 Months Service

2.8" WG



30" Hi-Flo ES  
after 6 Months Service .

0.3" WG

Cost Breakdown:		
TCO Elements	China 4V/PA Pleat	30" ES MV13
Energy Cost	37479 USD	19727 USD
Filter Cost	6900 USD	4200 USD
Labor Cost	1600 USD	700 USD
Waste Cost	0 USD	0 USD
CO <sup>2</sup> Impact	495855.92 lb	260982.82 lb
Landfill Impact	35.35 ft <sup>3</sup>	3.31 ft <sup>3</sup>
Total Cost of Ownership (TCO)	45979USD	24627 USD
Performance Satisfaction Terms		

The total cost of ownership was almost half the cost with the single-stage Hi-Flo ES solution compared to the two-stage Flanders/Yatair filter configuration.

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