

Air Filtration - Lifetime Efficiency

Office Building Saves \$17,000 with Filter Efficiency Upgrade

Company Profile:

A 242,000-square-foot office building in the downtown area of one of the three largest cities in the U.S. The office tower was built in 1931 and features a 13,000-square-foot marble lobby area.

The Situation:

The facility is serviced by two large air handling units supplying a total of 271,000 cfm, operating 12 hours per day. The building was using 4-ply synthetic (charged coarse fiber) filters as their high efficiency filters which were inexpensive but not providing the rated air filtration efficiency the user expected.

The Action:

Camfil Farr met with the Chief Building Engineer and presented information on fine fiber vs. coarse fiber media performance to indicate that the filters being used were probably operating at a much lower efficiency during use than indicated in initial ASHRAE test reports. Camfil Farr also introduced our Mobile Media Tester (MMT) which can be used on site to accurately test actual media efficiency from filters in use. The office facility removed an existing Tri-Dim[®] synthetic cube filter and an MMT test was performed indicating that the Tri-Dek[®] XL cube filter, rated at MERV 11, was actually operating at a MERV 7 efficiency. Camfil Farr fine fiber Hi-Flo[®] bag filters (MERV 11) featuring controlled media spacing to provide low energy usage along with good filtration efficiency were installed in a test bank.

The Result:

After three months, the Camfil Farr product was removed from the air handling unit test bank and an MMT test performed. The Camfil Farr



product performed at a MERV 10 efficiency, significantly better performance than the charged media. Camfil Farr then ran Life Cycle Costing (LCC) modeling software to optimize filter selection for a Total Cost of Ownership (TCO) comparison to the existing product being used. At a much higher cost per unit, the facility switched to Camfil Farr for total cost savings versus up front filter price.



“After installation, the facility had filters with 73% more media area per filter for longer life and met their particle removal efficiency requirements.”

The Proof:

Particle removal efficiency in real use improved by 42%. The building now met the standard of care as published by cognizant authorities for filtration efficiency in office buildings.

After additional consultation, pre-filters were eliminated to save energy as Camfil Farr advised that they were unnecessary in this application due to the contaminant loading and improved performance of the final filter.

Life Cycle Costing (LCC) analysis indicated Hi-Flo® 8-pocket bag filters as the optimized solution and projected a savings of \$17,008.06 per year in material and energy costs.

Even without the pre-filters, the Hi-Flo filters only needed replacing once a year. The controlled media spacing of the Hi-Flo promotes uniform airflow for full media area usage resulting in a long filter life.

	Tri-Dim® Tri-Dek® XL Cube	Camfil Farr Hi-Flo 24x24x22 8-Pocket
Pockets	1	8
Media Area	16 sq. ft.	58 sq. ft.
Media Type	Coarse Fiber	Fine Fiber
Flow Rate	1970 cfm	1970 cfm
Test Velocity	137.8	34.0 fpm
Rated Efficiency	MERV 11	MERV 11
Actual Efficiency	MERV 7	MERV 10
Efficiency @ 0.4µ	1%	21%

The Camfil Farr Hi-Flo will provide the critical removal efficiency on respirable size particles protecting the health of the building's occupants.

Filter Cost Comparison

CUSTOMER: Downtown Properties		Date: 1-Apr-06		ENERGY COST PER KWH		\$ 0.110							
ADDRESS:				FAN EFFICIENCY		60%							
ATTENTION:		FILTER COST COMPARISON TAKES INTO ACCOUNT LABOR, MATERIAL, ENERGY COST & PRESSURE DROP.		SYSTEM CFM		271,000							
PROJECT LOCATION:				SYSTEM HOURS OF OPERATION		12							
FAN SYSTEM #:													
FILTER DESCRIPTION	Qty	Cost Each (\$)	Changes per year	Labor per Filter	Annual Filter Cost	CFM per Filter	Initial DP	Final DP	Avg. DP	HP per Filter	Energy \$ per Filter	Annual Energy Cost	Annual Total Cost
Camfil Farr 1-Stage System (increased media area, lower DP)													
24x24x22 8-pocket Hi-Flo	200	\$24.00	1	0	\$4,800.00	1,355	0.20	1.00	0.60	0.2135	\$76.74	\$15,348.44	\$20,148.44
TOTAL CAMFIL FARR 1- STAGE SYSTEM					\$4,800.00	1,355	0.20	1.00	0.60	0.2135	\$76.74	\$15,348.44	\$20,148.44
Camfil Farr 2-Stage System (higher combined DP)													
Camfil Farr 30/30	200	\$5.75	2	0	\$2,300.00	1,355	0.20	0.90	0.55	0.1957	\$70.35	\$14,069.41	\$16,369.41
24x24x15 6-pocket Hi-Flo	200	\$18.24	1	0	\$3,648.00	1,355	0.34	1.00	0.67	0.2384	\$85.70	\$17,139.09	\$20,787.09
TOTAL CAMFIL FARR 1- STAGE SYSTEM					\$5,948.00		0.54	1.90	1.22	0.4341	\$156.04	\$31,208.50	\$37,156.50
Comparison Values (1-Stage Versus 2-Stage)					\$1,148.00		0.34	0.90	0.62	0.2206	\$79.30	\$15,860.06	\$17,008.06