case STUDY

PHARMACEUTICAL

Air Filtration & Energy Savings

Pharmaceutical Manufacturer Improves Air Quality while Significantly Reducing Their Energy Costs

Company Profile:

Multi-billion dollar, global pharmaceutical manufacturer.

The Situation:

Manufacturer was faced with energy being their largest operating cost component related to HVAC filtration. With over 300 air handling units (AHU) in one campus at their sprawling facility, situated in the Midwest to support multidisciplined manufacturing. Their facility management team identified the current spend on replacement filters was typically $400,000 annually, which accounted for only 15% of the overall air handling operating costs. The manufacturer's biggest concern was energy consumption which made up 70% of their total air handling running costs.

The Action:

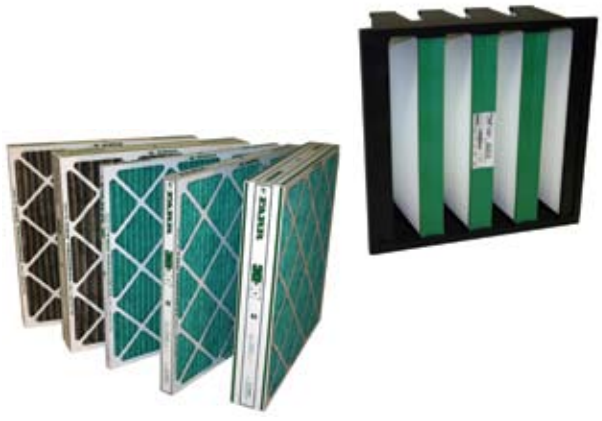
Faced with escalating expenses, the global manufacturer understood the business need to provide effective filtration, but realized they needed to do it at a reduced cost. The facility management team decided to set up a test on site to measure the energy consumption from three AHU's. One with the current vendor's existing combination, one with a new combination from the current vendor, and one with the Camfil Farr recommended combination.

After the test was completed (nine months), used filters were then brought to the 52.2 ASHRAE test rig at Camfil Farr's USA Corporate HQ in NJ for further efficiency, dust holding capacity and pressure drop analysis. The end user was present during the testing to verify their own field analysis versus lab condition testing.

The Result:

The tests results reflected that the pharmaceutical manufacturer would save 20% of their air handling unit energy cost by changing

to the Camfil Farr filter combination (30/30® panel filter with the Durafil® 4V). By converting, the facility would save $427,000 (their own calculation) – $299,000 in pure energy savings, and the balance being reduced labor, change frequency, disposal and storage cost. The analysis proved an average savings of $1,000 per AHU annually (based on 0.04 cents kw/hr). This represented phase one of the project. With over 800 AHU's on the campus, the total potential savings once the whole facility is converted will be over $1,000,000.



"Tests prove Camfil Farr filters to reduce pharmaceutical manufacturer´s annual air handling energy costs by 20%."

The Proof:

Tests found the Camfil Farr filter combination delivered the same cfm at a lower energy cost. This is a result of the Camfil Farr's filter construction designed with more media, sturdier frame and media support, and a unique filter media fold which allows for even loading across the filter.

The 30/30® tested most rigid. Proven through the testing, the Camfil Farr 30/30 had the most rigidity and was able to withstand the highest moisture (rainy, high humidity) conditions. One of the opposing filters did not meet its design static pressure without collapsing, thus not indicating a time to change the filter based on pressure. The other opposing prefilter met the efficiency in the laboratory testing, but only when secured into the test duct with duct tape. This resulted in excessive resistance to flow causing structural failure to the pleated filter.

The 30/30 and Durafil® maintained lowest resistance to airflow. The Camfil Farr 30/30 filter met the rated efficiency and maintained structural integrity throughout the one year service life. The resistance to airflow was just over the suggested final resistance of 1.0"wg. Neither of the two opposing filters held up under testing, indicating the life cycle would only be about half the expected one year of service life. The Camfil Farr Durafil had a resistance to airflow of 0.54"wg after one year of service, where the others came in at 0.62"wg and 0.98"wg.

For the duration of the test, all of the filters in the AHU's met their advertised efficiency and resistance values. This would be expected as all of the final filters used are made from glass micro-fiber media and do not depend upon an electrostatic charge to reach the advetised efficiency values.

The resistance to airflow is acceptable for the prefilters and final filters, but the flow rates are different between the AHU's used in this test. This is due to the control system balancing the systems on airflow resistance through each unit. Since the system equalizing the airflow amounts, the unit with the lowest resistance will draw the most airflow. Thus, AHU 10 with the Camfil Farr has 17% and 22% more airflow than the AAF AHU's. If all four AHU units on this control system contained Camfil Farr product, the energy usage for the system would decrease by the 17-22% value. This being a direct energy savings to the manufacturer and allows the units to operate more efficiently. In addition, the lower resistance and loading curves demonstrated by the Camfil Farr filters allow for fewer filter change outs, resulting in further savings in lower maintenance costs and lower stocking/inventory requirements.

Test Results

Data Table - Efficiency (%) and Statistical Uncertainty (%) Values by Particle Size (μm)

	Camfil Farr: 30/30 & Durafil 85%				AAF: Perfect Pleat & Varicel V 80%				AAF: Perfect Pleat & Varicel 80%			
Size (μm)	Test 1 09/08/05		Test 2 12/07/05		Test 3 N/A		Test 4 N/A		Test 1 09/08/05		Test 2 12/07/05	
	Eff	Unc	Eff	Unc	Eff	Unc	Eff	Unc	Eff	Unc	Eff	Unc
0.4	49.0	1.71	59.7	1.41	55.9	2.01	60.8	2.65	50.5	0.77	59.2	1.77
0.6	61.4	1.13	72.8	1.06	66.5	2.08	70.1	2.82	64.6	0.61	69.7	1.33
0.8	65.7	3.30	82.4	0.52	72.6	2.96	79.4	2.41	70.9	0.93	83.9	1.02
1.4	73.2	3.05	89.8	0.59	81.6	3.43	87.7	1.90	78.4	2.13	90.4	0.73
3.2	91.6	3.25	98.8	0.62	97.7	1.92	97.1	0.80	97.4	0.98	99.0	0.39
7.1	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0
Average Temp (F)	83.5		68.2		83.6		70.5		80.0		59	
Average RH (%)	48.6		38.5		44.9		38.2		55.1		46.1	
Velocity (fpm)	464		368		408		301		437		315	
Resistance ("wg)	0.43		0.26		0.49		0.31		0.49		0.42	