

## Air Filtration - Total Cost of Ownership

### Camfil Filters Create a Safer Environment with Lower Costs for Renowned Brewery

#### Company Profile:

Beer brewing company founded in 1855. This manufacturing facility produces 3.5 million bottles monthly and is the largest in the midwestern United States. The plant has 650 employees and an annual payroll of \$50 million.

#### The Situation:

The facility has 35 rooftop make-up air handling units (AHU) serving the production and administrative areas. Each AHU contained 24 filters, so approximate total airflow to the building is 1.6 million cfm. Each AHU had eighteen 20" x 25" x 12" filters and six 16" x 25" x 12" filters that were Airguard® two-pocket, synthetic (charged coarse fiber) media cube filters. The cube filters were being changed every four months at a filter and labor cost of \$509 per unit.

#### The Action:

The local Camfil representative surveyed the AHUs and determined two problems: (1) The units were experiencing air bypass due to poor fit and finish of the existing product, and (2) since coarse-fiber electrostatically-charged media was being used, the actual filter efficiency on particles in the 0.4-0.5 size range must be very low. The representative recommended changing to the 30/30® pre-filter product and provided particle counting measurements to determine actual filter efficiency with both type filters installed in two identical AHUs.

#### The Result:

In-field particle counts were conducted for two months using professionally calibrated equipment on filters from both manufacturers in respective systems. The test results indicated that the cube filter



had zero percent efficiency on 0.5 micron size particles, while the Camfil filter had 46 percent efficiency. Use of the Camfil product also eliminated bypass between filters and at end of track.



“In-field testing showed a 46 percent efficiency improvement in the removal of lung-damaging 0.5 micron particles.”

### The Proof:

Particle removal efficiency in real use improved by 46 percent.

At equal filter life, the cost for filters and labor for the 30/30® is \$329, due to ease of installation and higher performance in a less deep footprint. Thus, the annual facility-wide filter savings were \$18,900 or 34 percent.

Actual filter life is still being determined. If the 30/30 lasts longer than four months, the savings will be greater.

The Camfil 30/30 is much higher in filtering efficiency, especially on lung-damaging particles of 0.5 microns — 46 percent versus zero percent for the existing cube filter. Airflows and pressure drops are nearly identical.



#### AHU-14A

Filters: Camfil 30/30

Installed: July 28, 2006

Initial Pressure Drop: 0.16" w.g.

Airflow on Sept. 17: 450 fpm

Pressure Drop on Sept. 17: 0.17" w.g.

#### Particle Counts:

##### Upstream

0.5 microns - 30,205 + 41,907 = 36,056 average

5.0 microns - 120 + 91 = 106 average

##### Downstream

0.5 microns - 20,414 + 18,262 = 19,338 average

5.0 microns - 12 + 18 = 15 average

*Test Parameters* – 2 upstream counts on 0.5 and 5.0 microns for 1 minute, averaged

**Efficiencies:** 0.5 microns –  $36,056/19,338 = 46.4\%$

5.0 microns –  $106/15 = 85.8\%$

Actual performance in this system is equivalent to ASHRAE 52.2  
MERV: 10; Dust Spot Efficiency: 55%

#### AHU-13A

Filters: 2-Pocket Cube Filter

Installed: July 6, 2006

Initial Pressure Drop: 0.15" w.g.

Airflow on Sept. 17: 450 fpm

Pressure Drop on Sept. 17: 0.16" w.g.

#### Particle Counts:

##### Upstream

0.5 microns - 27,627 + 28,686 = 28,157 average

5.0 microns - 81 + 75 = 78 average

##### Downstream

0.5 microns - 27,648 + 29,844 = 28,746 average

5.0 microns - 12 + 19 = 16 average

*Test Parameters* – 2 upstream counts on 0.5 and 5.0 microns for 1 minute, averaged

**Efficiencies:** 0.5 microns –  $28,157/28,746 = 0.0\%$ <sup>1</sup>

5.0 microns –  $78/16 = 79.5\%$

Actual performance in this system is equivalent to ASHRAE 52.2  
MERV: 8; Dust Spot Efficiency: 35%

<sup>1</sup> Statistically insignificant difference within parameters of the particle counter, may indicate contaminant unloading.