

Air Filtration - Total Cost of Ownership

North American International Airport Installs Camsorb™ Canisters for Lowest Total Cost of Ownership

Company Profile:

Growing international airport serving approximately 3.8MM passenger volume annually.

The Situation:

This international airport in eastern North America was determined to expand their business. A new terminal was under construction, with 137,000 cfm of airflow slated to include gas-phase molecular filtration. The design engineering firm approached Camfil Farr with a loose gas-phase specification and requested guidance in selecting the proper hardware and filters.

The Action:

Busy airports face heavy gas-phase challenges from passengers, automotive and bus traffic, support vehicles, and jets.

The construction specification contained no gas-phase system performance specification. The facility requested a clean air solution that would minimize gas-phase filter life cycle costs and maintenance labor. Camfil Farr engineering recommended a comprehensive corrosion coupon survey of air quality surrounding the proposed terminal. When analyzed, most samples measured significantly corrosive air quality (Figure 1). Based on this result, the airport specified a gas-phase system capable of maintaining moderate or better air quality within the terminal ('G2' per ISA Standard S71.04).

Camfil Farr recognized that a high-capacity, high-efficiency, low-bypass system was required to maintain this specification for as long as possible in an HVAC system (Figure 2). Two stages of Camsorb® canisters were specified based on their low-bypass high initial efficiency and long life compared to conventional loose-fill modules.



The Result:

Two stages of plastic disposable CP-26 Camsorb canisters were installed in side-access Camsorb canister glide/pack housings. The first molecular filtration stage contained Campure 8 (CFS-102) media, selected to oxidize and destroy as many lightweight hydrocarbons and acid gases as possible. The second stage of molecular filtration contained CFS-201 activated carbon, for broad-spectrum odor control of the gas-phase contaminants remaining after the first stage of treatment. The AHU's final filters were Riga-Flo PH 95%.

“The airport found Camsorb canisters to be their clean air solution to minimize gas-phase filter life cycle costs and maintenance labor.”

The Proof:

Test and simulations in Camfil Farr’s molecular filtration laboratory show that Camsorb® canisters exhibit higher efficiency and greater capacity than conventional carbon modules (Figure 2). The higher efficiency is due to the double gasket seal on the canister inlet cone, which virtually eliminates bypass. The higher capacity results from

the innovative canister design. The 40% longer lifetime translates to less labor for canister replacement over time, and lower life cycle cost compared to the conventional carbon modules. Corrosion coupons will be periodically deployed inside the terminal to document ISA G2 ‘moderate’ or better indoor air quality, and to indicate when media replacement is due.

| CLASSIFICATION OF REACTIVE ENVIRONMENTS | | | | |
|---|-----------|---------------|------------|-------------|
| SEVERITY LEVEL | G1 – MILD | G2 – MODERATE | G3 – HARSH | GX - SEVERE |
| COPPER ONLY | <300 | <1000 | <2000 | >2000 |

ANALYSIS RESULTS

| COPPER CORROSION STRIP | | | | | | |
|------------------------|---------------------------------|-------------------------|---------------------------|---------|---------|-----------|
| C. NO. | LOCATION | OXIDE Cu ₂ O | SULFIDE Cu ₂ S | UNKNOWN | TOTAL Å | ISA CLASS |
| C.946 | 2 ND FLOOR MECH.N.G2 | 361.9 | 2463.1 | - | 2825.0 | GX |
| C.947 | GATE 14 A3 | 388.4 | 2134.7 | - | 2523.1 | GX |
| C.948 | BASEMENT NORTH G3 | 19.2 | 1580.5 | - | 1774.7 | G3 |
| C.950 | 2 ND FLOOR G2 | 264.8 | 1590.7 | - | 1855.5 | G3 |
| C.951 | GATE 15 A4 | 591.4 | 687.6 | - | 1279.0 | G3 |
| C.952 | OA INTAKE SOUTH G4 | 829.8 | 2586.3 | - | 3416.1 | GX |
| C.953 | GATE 6 A2 | 105.9 | 18.4 | - | 824.3 | G2 |
| C.954 | GATE 3 A1 | 670.9 | 472.1 | - | 1143.0 | G3 |

Figure 1. Summary of corrosion coupon results at North American international airport showing harsh (G3) and severe air (GX) classifications at 8 of 9 sample locations.

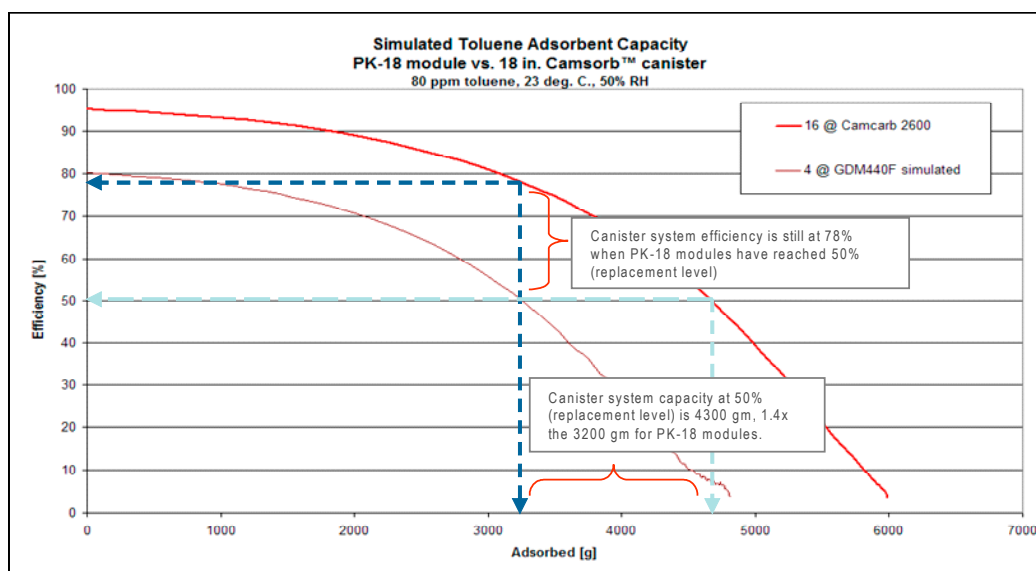


Figure 2. Figure 2. A 24" x 24" bank of 16 CP26 Camsorb™ canisters contains 2.34 cu. ft. of carbon media, +24% more than 4 @ conventional ‘PK-18’ style modules. In addition, the canister system will exhibit an initial removal efficiency of 95% for toluene. By comparison, a PK-18 module system will exhibit an initial removal efficiency of no more than 80%, due to bypass around the modules in their tracks.

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