



Air Filtration - No Prefilter Required

Arena Dramatically Reduces Energy, Labor and Disposal Expenses by Converting to a Final Filter Designed to Work without a Prefilter

Company Profile:

Verizon Wireless Arena is New England's premiere indoor sports and entertainment venue, hosting hockey, motor sports, concerts and special shows. SMG, the arena's management company, is part of a large national facility management organization.

The Situation:

The sports arena is located in an urban environment, and intakes large amounts of outside air. While AHUs only run about 1800 hours per year, air flow demands during operating hours are high. "Monster truck" shows and other motocross events, in particular, contribute to high filter loading.

In the past, the arena changed their standard capacity pleated filters twice a year and MERV 13 fine fiber metal frame final filters once a year. Reducing labor and operating costs for this process while maintaining high air quality was the facility's primary objective; reducing disposal and landfill costs was an important secondary goal.

The Action:

In order to establish a "baseline" Total Cost of Ownership, Life Cycle Cost (LCC) modeling was performed on the existing filter program – Aeropleat® III standard capacity pleated filters and Aeropac MERV 13, rigid final filters.

Due to limited space downstream of the filter frames before the coil, one-stage filtration was modeled using a 12" deep Hi-Flo® ES MERV 13 bag filter designed to operate without a prefilter. LCC results indicated a 12 month service life could be guaranteed using the Hi-Flo ES. A quarterly evaluation plan was put in place to quantify pressure drop and determine filter load.

The Result:

Typical velocity for the filters is about 400 cfm and most units operate with 100% outside air. At six months, the bag filters showed uniform loading, and



pressure drop had risen less than 0.1" w.g. Based on two samples taken over six months, Camfil Farr projected that Hi-Flo ES would last well past the guarantee threshold of twelve months, and would likely last as long as eighteen months.

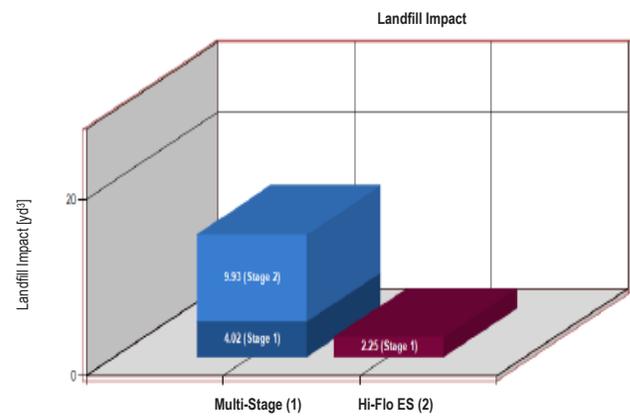
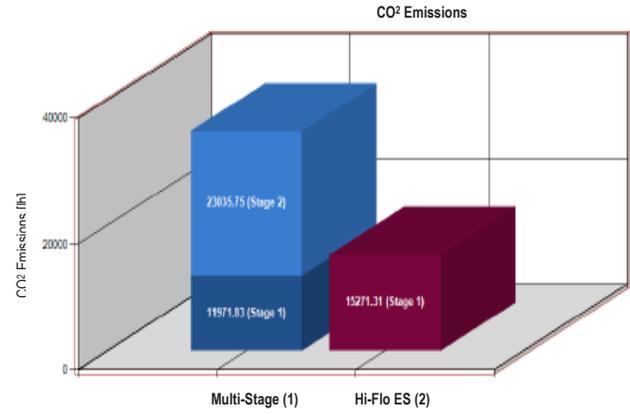
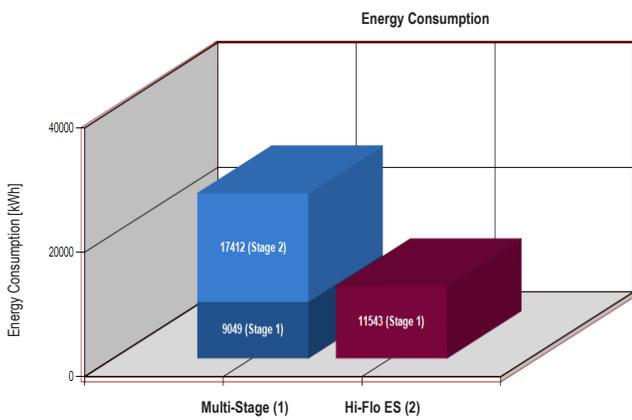
As predicted by the LCC modeling software, the Hi-Flo ES maintained uniform loading even after enduring harsh New Hampshire weather in an urban environment. The bags remained a bright green color on the downstream side, with no evidence of bypass. Additionally, the high moisture content of the 100% make-up air did not affect filter performance. In the end, the energy savings per filter was over \$30.00, or approximately \$5,500.00 annually, and the arena forecasted a 75% net reduction in disposal and landfill costs.



"The Hi-Flo ES significantly lowered total cost of ownership and maintained consistently high filtration efficiencies."

The Proof:

The LCC analysis identified quantifiable advantages for the arena to convert to the Hi-Flo ES one-stage filtration solution. Maintaining the same level of particle removal efficiency as the previous multi-stage solution, the Hi-Flo ES would provide significant savings through out the entire lifecycle of the filter. The analysis proved the Hi-Flo ES would produce a 45% annual cost savings for the arena. The conversion also presented dramatic sustainability opportunities to reduce energy consumption by 14,918 kWh (56%), CO² emissions by 19,736.27 lb (56%), and landfill by 11.70 yd³ (84%).



Cost Breakdown:

TCO Elements	Multi-Stage	Hi-Floe ES
Energy Cost	3176 USD	1386 USD
Filter Cost	5319 USD	3305 USD
CO ² Impact	35007.58 lb	15271.31 lb
Landfill Impact	13.95 yd ³	2.25 yd ³
Total Cost of Ownership (TCO)	8494 USD	4690 USD
Performance Satisfaction Terms		

