

S1.1.2 TOTAL COST OF OWNERSHIP DIAGNOSTIC TOOL FOR AIR FILTRATION SYSTEMS

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When selecting an HVAC filter, a balance must be struck between filter performance and cost. There is a wide array of other selection factors for HVAC filtration products as well, including the end application, minimum particle removal efficiency, energy consumption, and life of the filter. If a filter is selected based only on the cost and performance, however, the total cost of ownership (TCO) is not taken into account. For instance, a common practice is to compare filter test data that are taken from face velocities differing from the end application. Another method is to use overall system fan efficiency as a constant, when in actuality it is variable from about 30% to over 80%, based on fan system type and operating percentage of full rated flow. Incorrect assumptions like these can skew the TCO presented to the end user.

TCO includes the costs of the filter and the energy required to arrive at service cycles, maintenance schedules, type of air handling unit, fan system efficiency, operating air velocities, and local energy. Taking these factors into account for selecting the filter yields a realistic estimation of cost, as this cost is then tailored to the end user's operating conditions, not a lab simulation. Taking into consideration the freight, disposal, and changeout labor costs based on the end user's operational parameters and system configuration also contributes to an optimized TCO for filter selection.

Well-designed filters with low resistance and long service cycles effectively lower energy costs and yearly filter costs. The filter end-user needs a combination of filters that both delivers the best TCO and fits into budget and maintenance schedules. This paper shows how an optimized TCO calculation takes complex interactive effects into account, demonstrating both optimum costs and costs at widely variable maintenance schedules.