

Comparative Performance of Disposable Liquid Filter Cartridges in Realistic Tests

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An experimental program was carried out to determine the comparative performance of different types of disposable liquid filter cartridges as a basis for setting best practices in Dow Chemical processes. The objective was to compare the removal efficiency and service life of such cartridges in a realistic, single-pass test using standard operating conditions and feed suspensions. A test apparatus and appropriate methodology were developed for this purpose, and test conditions followed generally accepted guidelines. Sixty-eight different types or ratings of cartridges from the three largest, global suppliers of standard 2.5-inch diameter elements for liquid service were evaluated. Elements were chosen to represent commonly utilized product categories. Removal ratings from 0.8 to 30 microns were tested, each in the nominal 10-inch length. Pleated and cylindrical versions constructed of various filter media for different categories of use were examined. Several products were tested multiple times to establish the precision of program measurements. Four overall conclusions emerged. First, no single manufacturer makes a clearly superior product for most categories, but each manufacturer offers a few superior products. Second, particle removal ratings are generally inflated if judged by the beta ratio measured at the rating of cartridge. Third, high-quality stringwound construction often outperforms graded density fiber media. Finally, surface area has incomparable impact on service life with satisfactory efficiency, and the value of that factor should be weighed against its higher initial expense.