EVALUATION OF PASSIVE AND ACTIVE PARTICULATE FILTERS FOR REMOVAL OF PARTICULATE EMISSIONS FROM DIESEL ENGINES

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As particulate emission standards for diesel engines are tightened, manufacturers and users are looking toward catalytic filters as one means of meeting the new standards. This study evaluated the effect of passive and active catalytic filters on diesel exhaust in terms of particulate matter concentration and size distribution, black carbon (soot) concentration, and particle-bound polycyclic aromatic hydrocarbon concentration. Passive filters were installed on three military diesel buses, and an active filter was installed on two military diesel generators. Particle concentrations were measured before and after installation of the filter and again after several months of operation. Generally, the passive filter removed at least 90 percent of particulate matter mass, black carbon, and particle-bound polycyclic aromatic hydrocarbons, and the removal efficiency did not deteriorate after several months of operation. The limited gas-phase pollutant measurements showed that the filters also reduced total hydrocarbon and carbon monoxide. In addition to evaluating the catalytic filters, the sampling team also compared the results of several real-time particle measurement instruments to traditional filter measurements.