

MODERN CHALLENGES IN FUEL FILTRATION AND SOLUTIONS FOR IT

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Stringent environmental regulations and a move toward greener energy have encouraged use of biodiesel/ULSD blends, which have raised potential fuel filtration problems such as decreased emulsified water separation efficiency, shortened fuel filter life, chemical compatibility, etc. In addition to this, growing research in the fuel filtration industry has created a demand for a glass free filter and a knowledge of filter performance towards its end of life. These all have created new challenges in the diesel fuel filtration industry. This research presents an innovative, glass free, depth coalescing fuel filter developed by Parker Hannifin EMOE Division Modesto USA, which is the solution to the above-mentioned challenges. The emulsified water removal efficiency for a dispersed droplet size of 10 μm and the solid particle removal efficiency of the developed media was compared with commercial comparative fuel filters. The solid contamination removal efficiency of the filters was tested according to ISO19438 and dirt holding capacity according to ISO4020. A bench scale test with and without artificial loading was performed to evaluate filter water removal performance towards its end of life. The developed gradient density filter, which contains nanofibers and is glass free, is superior in water separation than the existing commercial filters for B20 at interfacial tension values of 5-13 mN/m and maintains the excellent water separation performance even when loaded with dirt. The developed glass free filter has similar particle removal efficiency and dirt holding capacity as the compared commercial glass-free and glass-containing filters.