

POLARIZED FIBER MEDIA FOR FILTRATION OF DISPERSED WATER DROPS IN ULSD

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The objective of this research is to design a polarized filter fiber to achieve high efficiency and lower pressure drop for filtration of dispersed water droplets from ULSD fuel. High Piezoelectric PVDF polymer material is selected as the material for filter media.

As diesel is the primary source of fuel in diesel fuel systems. Maintaining the quality of the diesel is important for filtration industries. Even small amounts of water contamination can cause engine corrosion, rusting, and release of obnoxious gases causing adverse environmental and health effects. Separation of micron sized dispersed water can be achieved by using conventional filters with high pressure drop. But for water droplets that are less than micron size become difficult to separate without further increasing the pressure on the filters. Using the polarized filters, we can achieve separation of these droplets with reduced pressure drop.

Using inhouse polarization device, the electrospun fiber media is polarized to orient the molecules and thus polarize the filter media. Polarized filters have shown increase in pore size, high filtration efficiency with reduced pressure drop compared to conventional filters used in diesel fuel systems. Polarized filter media showed self - cleaning ability that helped in maintaining the lower pressure drop across the filter. The effects of the solvents on these charged media is also discussed over the period.

Tubular filters show increase in filtration efficiency, Polarized mats are tested for a tubular surface in relation to the flat media for increased filtration efficiency and reduced pressure drop. Parameters considered in this research are Polarized (PFF) and Unpolarized (FF) filter media, Face velocity, water concentration and basis weight of the filter media.