

A MODEL TO PREDICT THE CONTRIBUTION OF SCREEN IN THE EFFICIENCY OF FUEL FILTERS

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As advanced diesel injection systems are working at higher pressure, sensitive components are increasingly affected by water, always present in fuels as droplets. If dispersed water reaches the injection system, it can cause corrosion and inadequate lubrication.

Fuel filters are devices able to separate contaminants and water from diesel fluid. They usually consist of multiple stages: last generation filters include a hydrophobic mesh as a final barrier preventing water from going inside the injection system. Tailoring the geometrical features of the fabric (such as mesh opening and open area), it is possible to adjust the water separation efficiency of the filter at different droplets size.

Testing different types of fabric allowed the basis for a study on the influence of each geometrical parameters on the separation efficiency. The analysis of the results led to the construction of a model, through which the diesel-water separation efficiency of a fabric could be predicted by knowing the mesh opening and the open area of the fabric itself.

Here, it is illustrated how this predictive model allows the design of new meshes with higher performances from the diesel-water separation point of view.