

## How to measure performances of combustion engines biofuel filters

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### ABSTRACT

To fulfil CO<sub>2</sub> emission regulations and reduce fossil energy consumption, more and more combustion engines use bio fuels, i.e. high specific energy liquids obtained by processing natural vegetable resources, alone or blend in various proportions with oils.

These new fuels have to fulfil requirements on particulate contamination level and water content very similar to those of traditional fuels.

Fuel filter performances are measured according to well known standard methods (ISO 19438, ISO TS 16332, SAE J1488 and others) the lecture will summarise and compare, focusing on efficiency of particulate and water contents reduction .

New bio fuels have different properties, physical, chemical, and physical-chemical ones, which impact flow and particles behaviours within the porous structure. A given media (whatever cellulose or micro glass fibres paper, synthetic nonwoven) always has different performance when evaluated with fossile or bio fuel.

The paper will discuss various aspects of filter test methods impacted by these new fuels.

Particle counters calibration: difference in particle size measurements after ISO 11 171 calibration with NIST SRM 2806 or after use of monosized polystyrene beads in water.  
On line particle counting: impact of new fuels on equipments to control flow through APC sensors and to dilute high concentration suspensions.

Water/fuel emulsion generation: how water droplet size can be measured and certified?  
How behaves the ISO TR 16332 office plate and water/fuel separators on the return line? How is water concentration measured and monitored?

Water/fuel separation efficiency: how are composed efficiencies of same filters with fossil fuels and bio fuels?

Data presented will be discussed and proposition of integration in current standards or in new standards to be drafted will be made.