



INFORMATION

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Investigations on the Addition of FAME to Diesel Fuels

Part I: Laboratory test programme

Part II: Coking test runs with four B5 fuels and a reference fuel with the analysis of deposits formed at the nozzles of diesel fuel injectors

The addition of biodiesel to conventional diesel fuels has an impact on fuel quality, especially on oxidation stability, which can be significantly reduced, depending on the basic fuel and the biodiesel in the fuel blend. The stringent requirements, which diesel engines have to fulfil nowadays, e.g. according to legislation on exhaust gas emissions, call for a reliably good fuel quality. The influence of 5 % biodiesel on coking of fuel injector nozzles has basically not yet been investigated and assessed.

In the laboratory test programme, the impact of FAME additions to sulphur-free diesel fuels on oxidation stability is systematically investigated, in order to get a broad data basis. In addition to the oxidation stability of diesel fuel/FAME blends (B5 and B20) and their corresponding blending components, investigations were carried out on storage stability and on interactions of the additives of diesel fuel and FAME.

Based on the results of the laboratory test programme, four B5-diesel/FAME blends were selected, which were examined in endurance tests on four engines of different builders with regard to deposit formation at injector nozzles in comparison with straight diesel fuel.

It turned out, that diesel/FAME blends can exhibit a very sophisticated behaviour of deterioration. Basically, oxidation stability is impaired by the addition of FAME to fossil diesel fuel. In some cases, however, diesel/FAME blends can show a higher level of stability than the original components.

The results of the engine tests have shown definitely that not only the engine, but also fuel quality influence deposit formation on nozzles. It can be stated, that blends of diesel fuel with 5 % biodiesel (B5) do not necessarily exhibit a higher risk for deposit formation than straight mineral oil based diesel fuels. However, there are indications that certain B5 fuels can lead to an increased formation of deposits.

Source: DGMK-Forschungsbericht 639
Untersuchungen zu FAME in Dieselmotoren
Teil I: Laboruntersuchungsprogramm
Teil II: Durchführung von Verkockungstestläufen mit vier B5-Kraftstoffen und einem Referenzkraftstoff mit Analyse der gebildeten Beläge an Dieseleinspritzdüsen
(DGMK-Research Report 639
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Part I: Laboratory test programme
Part II: Coking test runs with four B5 fuels and a reference fuel with the analysis of deposits formed at the nozzles of diesel fuel injectors)
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