



2nd VegOil

Demonstration of 2nd Generation Vegetable Oil Fuels in Advanced Engines

Workpackage 3 Fuel development

Deliverable N°3_6: Engine vs oil quality test report Addition for Testrun with Jatropha oil

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1 Summary

In addition to the report D3.6 from 28.08.2009 in which different qualities as well as varieties of plant oils were tested, the Jatropha oil test run is to be reported, which, due to a lack of availability of testing fuel, could not be conducted last year. By now, the test run as a permanent test of 1000 hours has been conducted as planned. The experiment was conducted like the other test runs using a 1-cylinder test engine. The advantage of these test engines that indicates the exact motor processes are the availability, the progress of cognisance and the low cost structure of the engine.

The decision to conduct the test runs on test machines was made within the frames of the 1st Amendment. The reasoning behind this was to widen the experience with so called "other oils".

This one thousand hours test run on Jatropha oil was conducted between 9 April 2010 and 21 Mai 2010.

The important results of the test run are:

- Jatropha oil can be injected into a test engine for residue-free combustion; after a 1000 hours engine run with jatropha oil, possible engine life cycles are supposed to be equally long as for rapeseed oil.
- Jatropa oil must be limited to a power of 4.3 kW_{el} in the test engine to ensure a constant exhaust gas temperature at the exhaust manifold.
- The test run results can, according to present experience, be transferred to state of the art common rail engines.

The test shows stable temperature behaviour over nearly 1000 hours. Only the seat of the injection needle has non visible deposits. This has to be evaluated in further investigations. Also the context of free fatty acids, oxidation stability and remnants of Ca, Mg, and P as possible residue formation should be further investigated.

The fact that the power output had to be reduced is probably due to the poorer ignition delay or non-ignitability of jatropha oil compared to the rape seed oil.

