

Formulasi dan pengujian pelumas BIO 2T berbahan dasar epoxied fatty acid methyl esters (EFAME)

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Abstrak

Pelumas bio 2T dibuat menggunakan Epoxied Fatty Acid Methyl Esters (EFAME) sebagai minyak dasar. EFAME kemudian diformulasikan dengan aditif anti aus dan tekanan ekstrim. Pengujian intensif mengenai output energi, emisi, dan ketahanan aus bagi EFAME tanpa aditif, EFAME terformulasi aditif, serta pelumas mineral komersial dilakukan. Pengujian energi dan emisi menggunakan genset 2T portabel Yamaha, ET 950 dan gas analyzer, sedangkan pengujian ketahanan aus menggunakan mesin pengujian four ball. Hasil menunjukkan EFAME terformulasi aditif menyebabkan output energi setara dengan pelumas mineral komersial sekaligus memiliki ketahanan aus yang jauh lebih, meskipun viskositas EFAME (pada 40°C, 6.7184 cSt dan pada 100°C, 3.0151) lebih rendah daripada pelumas mineral komersial (pada 40°C, 96.2928 cSt dan pada 100°C, 11.0032). EFAME tanpa aditif menunjukkan hasil emisi pembakaran yang lebih sempurna dari pelumas mineral komersial, namun penambahan aditif tidak memperbaiki emisi yang dihasilkan EFAME.

.....2T Biolubricant was made using Epoxied Fatty Acid Methyl Esters (EFAME) as the base oil. Then EFAME was formulated with anti wear and extreme pressure additives. A comparative study of energy output, emissions and wear resistance was carried out on EFAME with and without additives, and a mineral oil-based commercial lubricant. The energy and emissions test was conducted using a two-stroke gasoline Yamaha portable generator set, ET 950 and gas analyzer, while the wear test using a four ball wear machine.

The results showed that EFAME formulated with additives caused an equal energy output and much better wear resistance than mineral oil-based commercial lubricant, even though EFAME's viscosities (at 40°C, 6.7184 cSt and at 100°C, 3.0151 cSt) is lower than mineral oil-based commercial lubricant (at 40°C, 96.2928 cSt and at 100°C, 11.0032 cSt). EFAME without additives proved to have better combustion emissions than mineral oil-based commercial lubricant, but additives proved not to repair EFAME'S emission level.