



International Journal of Green Energy >

Volume 13, 2016 - [Issue 14](#)

189 | 17 | 0
Views | CrossRef citations to date | Altmetric

Original Articles

Experimental investigation on engine performances, combustion characteristics and emission of exhaust gases of VCR engine fuelled with cottonseed oil methyl ester blended with diesel

M. Santhosh & K. P. Padmanaban

Pages 1534-1545 | Accepted author version posted online: 10 Dec 2014, Published online: 10 Dec 2014

Cite this article <https://doi.org/10.1080/15435075.2014.977438>



Sample our
Built Environment
Journals
>> [Sign in here](#) to start your access
to the latest two volumes for 14 days

Full Article

Figures & data

References

Citations

Metrics

Reprints & Permissions

Read this article

Share

ABSTRACT

This research work investigates the engine performances, combustion characteristics, and emission of exhaust gases of variable compression ratio engine fuelled with cottonseed oil methyl ester (COME) and diesel at different blends. The analysis showed that heat release rate and cylinder pressure is higher for diesel than COME blends. Higher BTE is obtained at the maximum load condition. The higher BTE and lower SFC are obtained for blend B15 as 42.17% and 0.2 kg/kW-hr at brake mean effective pressure (BMEP) of 4.64 bar. Also it is found that the peak cylinder gas pressure and combustion duration increases when the BMEP increases. At the BMEP of 3.51 bar, higher HRR is observed as 18.12 J/deg. Increase in HRR is obtained as 6.07% for B30 at

BMEP of 4.64 bar when compared to diesel. Ignition delay decreased by 13.16% for B100, by the increment of blend proportions when compared to diesel, at BMEP of 4.64 bar. Lower smoke, HC and CO emissions are observed when increasing the blend proportions, whereas the nitric oxide emissions increases due to the better combustion resulted in higher temperatures. At BMEP of 4.64 bar, the CO emissions are reduced to 25.24% for neat biodiesel when compared with the diesel.

KEYWORDS:

Cottonseed oil methyl ester

cylinder pressure

emission

heat release rate

VCR Engine

Acknowledgment

The authors thank the management of PSNA College of Engineering and Technology for providing the necessary experimental setup for this research.

Funding

The authors thank the All India Council for Technical Education (AICTE), Government of India for providing grant (NO.8024/RID/MOD/70/08/09) under Modernization and Removal of Obsolescence (MODROB) scheme for purchase of VCR engine.

Additional information

Funding

The authors thank the All India Council for Technical Education (AICTE), Government of India for providing grant (NO.8024/RID/MOD/70/08/09) under Modernization and Removal of Obsolescence (MODROB) scheme for purchase of VCR engine.

A study of the performance, emission and combustion characteristics of a compression ignition engine using methyl ester of paradise oil–eucalyptus oil blends

Source: Applied Energy

Performance and emission analysis of cottonseed oil methyl ester in a diesel engine

Source: Renewable Energy

Political, economic and environmental impacts of biofuels: A review

Source: Applied Energy

Biofuels (alcohols and biodiesel) applications as fuels for internal combustion engines

Source: Progress in Energy and Combustion Science

Biocatalytic production of biodiesel from cottonseed oil: Standardization of process parameters and comparison of fuel characteristics

Source: Applied Energy

Combustion Characteristics of Diesohol Using Biodiesel as an Additive in a Direct Injection Compression Ignition Engine under Various Compression Ratios

Source: Energy & Fuels

Related research

People also read

Recommended articles

Cited by
17

Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

Keep up to date

Register to receive personalised research and resources by email



[Sign me up](#)



[Copyright © 2025](#) [Informa UK Limited](#) [Privacy policy](#) [Cookies](#) [Terms & conditions](#)

[Accessibility](#)



Taylor & Francis Group
an informa business

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG