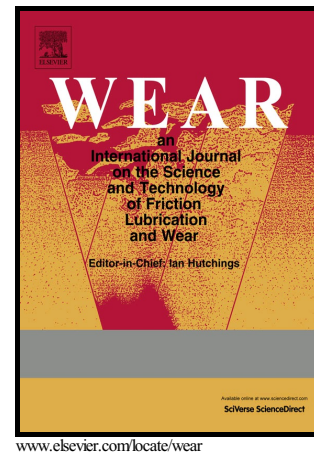


Author's Accepted Manuscript

Lubricated sliding wear of SAE 1045 and SAE 52100 steel against alumina in the presence of biodiesel, diesel and a 50:50 blend of those fuels

Victor Velho de Castro, Luiz Antonio Mazzini Fontoura, Juliano Dornelas Benfica, Marcus Seferin, Joyson Luiz Pacheco, Carlos Alexandre dos Santos



www.elsevier.com/locate/wear

PII: S0043-1648(16)30389-1
DOI: <http://dx.doi.org/10.1016/j.wear.2016.09.026>
Reference: WEA101788

To appear in: *Wear*

Received date: 4 July 2016
Revised date: 26 September 2016
Accepted date: 29 September 2016

Cite this article as: Victor Velho de Castro, Luiz Antonio Mazzini Fontoura, Juliano Dornelas Benfica, Marcus Seferin, Joyson Luiz Pacheco and Carlo Alexandre dos Santos, Lubricated sliding wear of SAE 1045 and SAE 52100 steel against alumina in the presence of biodiesel, diesel and a 50:50 blend of those fuels, *Wear*, <http://dx.doi.org/10.1016/j.wear.2016.09.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

LUBRICATED SLIDING WEAR OF SAE 1045 AND SAE 52100 STEEL AGAINST ALUMINA IN THE PRESENCE OF BIODIESEL, DIESEL AND A 50:50 BLEND OF THOSE FUELS

Victor Velho de Castro^a, Luiz Antonio Mazzini Fontoura^b, Juliano Dornelas Benfica^a, Marcus Seferin^a, Joyson Luiz Pacheco^a, Carlos Alexandre dos Santos^{a*}

^aPontifícia Universidade Católica do Rio Grande do Sul – PUCRS, Av. Ipiranga, 6681, 90619-900, Porto Alegre, Rio Grande do Sul, Brazil.

^bFundação de Ciência e Tecnologia do Rio Grande do Sul - CIENTEC, Cachoeirinha, Rio Grande do Sul, Brazil.

*Corresponding author. Carlos A. Santos. Tel: +55 51 3353-4058; carlos.santos@pucrs.br

ABSTRACT

The purpose of this work was to evaluate the sliding wear characteristics of SAE 1045 and SAE 52100 steels with different microstructures in the presence of pure biodiesel, a biodiesel-diesel blend (50% diesel + 50% biodiesel) and commercial diesel fuel. Non-lubricated tests (dry) were also performed for comparison. For SAE 1045, samples were given a hardening heat treatment (austenitization at 830°C and water quenching). For SAE 52100, the heat treatment was austenitization at 850°C followed by oil quenching. Tempering at 100°C and 300°C was used for SAE 1045, and tempering at 100°C and 200°C was used for SAE 52100. As a result, the samples had four different hardness and microstructure combinations: tempered martensite in SAE 1045 and tempered martensite with chromium carbides in SAE 52100. Wear testing was performed using a pin-on-disk tribometer, 1.8 m/s sliding speed, 14.7 N load and 4400 m sliding distance following the ASTM G99-04 standard. Wear track surfaces were characterized using microindentation hardness and scanning electron microscopy. The results exhibited a tendency to decrease wear width, volume loss and wear coefficient when adding biodiesel to diesel for both SAE 1045 and SAE 52100 steels. Martensite produced by heat treatments increased the wear resistance. For both SAE 1045 and SAE 52100 steels, abrasive wear is dominant in both dry and lubricated conditions.

Download English Version:

<https://daneshyari.com/en/article/4986903>

Download Persian Version:

<https://daneshyari.com/article/4986903>

[Daneshyari.com](https://daneshyari.com)