

## Certificate of Analysis

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Lab No. 601637 (ALTEMP)  
Report Date: June 7, 2006

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**Sample Description:**

Lab Number 601637: Neat Diesel Fuel Sample  
Lab Number 601638: 500:1 DFA in Diesel Fuel  
Lab Number 601639: 1000:1 DFA in Diesel Fuel

**Dear Mike:**

Thank you for your confidence in Herguth Laboratories, Inc. Please accept this report and attachments as our conclusion to the above numbered project/sample descriptions.

**Conclusion:** The data indicate that the samples which contained the DFA additive had better lubricity results for both ASTM test methods than the neat fuel (Table 1). The data showed that the 500:1 treatment of DFA additive provided the best lubrication for the SLBOCLE test; however, the results remained the same for either additive treatment under HFRR test conditions, but a significant reduction in wear scar diameter nonetheless.

**Background:** Three samples were submitted for lubricity testing per ASTM D6079, Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR), and ASTM D6078, Standard Test Method for Evaluating Lubricity of Diesel Fuels by the Scuffing Load Ball-on-Cylinder Lubricity Evaluator (SLBOCLE). Table 1 displays the result for each test. The samples which contained the DFA additive had better lubricity results for both ASTM test methods than the neat fuel.

**Table 1. Lubricity Test Results, ASTM D6078 and ASTM D6079**

Sample ID	ASTM D6079 HFRR, wear scar mm	ASTM D6078 SLBOCLE, grams*
601637, Neat Fuel	0.34	4450
601638, 500:1 DFA in Neat Fuel	0.165	5800
601639, 1000:1 DFA in Neat Fuel	0.165	5250

\* Reproducibility for ASTM D6078 is 900 grams.

Respectfully submitted,



Mindy L. Villalba  
Project Manager

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06/07/06

Page 1

Client Code :ALTEMP      Sample Date : 05/23/06      P.O. Number : VERBAL  
Herguth ID : LAB601637  
Description : Neat fuel sample

Test Performed	Proc-Rev	Result
Lubricity of Diesel Fuel by SLBOCLE .....	6078-1.0	4450 grams
Lubricity of Diesel Fuel by HFRR at 60°C .....	6079-1.0	0.340 mm

Please see attached report.

Respectfully Submitted,  
Herguth Laboratories, Inc.



Mindy L. Villalba, Project Manager

cc: Mike Phelps  
Charles Foscue

**Certificate of Analysis**  
**Lab Number 601638**

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06/07/06

Page 1

Client Code :ALTEMP      Sample Date : 05/23/06      P.O. Number : VERBAL  
Herguth ID : LAB601638  
Description :500:1 DFA in Diesel Fuel

Test Performed	Proc-Rev	Result
Lubricity of Diesel Fuel by SLBOCLE . . . . .	6078-1.0	5800 grams
Lubricity of Diesel Fuel by HFRR at 60°C . . . . .	6079-1.0	0.165 mm

Please see attached report (reference lab number 601637).

Respectfully Submitted,  
Herguth Laboratories, Inc.



Mindy L. Villalba, Project Manager

cc: Mike Phelps  
Charles Foscue

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06/07/06

Page 1

Client Code :ALTEMP      Sample Date : 05/23/06      P.O. Number : VERBAL  
Herguth ID : LAB601639  
Description :1000:1 DFA in Diesel

<u>Test Performed</u>	<u>Proc-Rev</u>	<u>Result</u>
Lubricity of Diesel Fuel by SLBOCLE . . . . .	6078-1.0	5250 grams
Lubricity of Diesel Fuel by HFRR at 60°C . . . . .	6079-1.0	0.165 mm

Please see attached report (reference lab number 601637).

Respectfully Submitted,  
Herguth Laboratories, Inc.



Mindy L. Villalba, Project Manager

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Charles Foscue