

E.H. Wolf and Sons in Slinger, Wisconsin supplied us with a sample of 100% soybean based bio-diesel. This sample was used to blend with the baseline fuel to create a 2% bio-diesel for testing.

Each additive was bottled separately in identical glass containers. The bottles were labeled only with a number. This number corresponded to the additive contained in the bottle. The order of numbering was done randomly by drawing names out of a hat. Only Spicer Research held the key to the additives in each bottle.

The additive samples were then sent in a box to the independent research firm for testing. The only information given them was the ratio of fuel to be added to each additive sample. For example, bottle "A" needs to be mixed at a ratio of "480-1". The ratio used for each additive was the "prescribed dosage" found on the bottle label for that product. Used motor oil and 2-cycle oil were tested at a rationally chosen ratio of 200:1.

The technician at the laboratory mixed the proper ratio of each "bottled fluid" into a separate container containing the baseline fuel. The data, therefore, is meaningful because every additive is tested in the same way using the same fuel. A side-by-side comparison of the effectiveness of each additive is now obtainable.

THE RESULTS:

These results are listed in the order of performance in the HFRR test. The baseline fuel used in every test started at an HFRR score of 636. The score shown is the tested HFRR score of the baseline fuel/additive blend. Also included is the wear scar improvement provided by the additive as well as other claimed benefits of the additive. Each additive is also categorized as a Multi-purpose additive, Multi-purpose + anti-gel, Lubricity only, nonconventional, or as an additive capable of treating both gasoline and diesel fuel.

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RESULTS

In Order Of Performance:

1) 2% REG SoyPower bio-diesel
HFRR 221, 415 micron improvement.
50:1 ratio of baseline fuel to 100% biodiesel
66.56 oz. of 100% biodiesel per 26 gallons of diesel fuel
Price: market value

2) Opti-Lube XPD
Multi-purpose + anti-gel
Cetane Improver, Demulsifier
HFRR 317, 319 micron improvement.
256:1 ratio
13 oz/tank
\$4.35/tank

3) FPPF RV, Bus, SUV Diesel/Gas Fuel Treatment
Gas and Diesel
Cetane improver, Emulsifier
HFRR 439, 197 micron improvement
640:1 ratio
5.2 oz/tank

4) Opti-Lube Summer Blend
Multi-purpose
Demulsifier

HFRR 447, 189 micron improvement
3000:1 ratio
1.11 oz/tank
\$0.68/tank

5) Opti-Lube Winter Blend
Multi-purpose + anti-gel
Cetane improver
HFRR 461, 175 micron improvement
512:1 ratio
6.5 oz/tank
\$3.65/tank
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6) Schaeffer Diesel Treat 2000
Multi-purpose + anti-gel
Cetane improver, Emulsifier, bio-diesel compatible
HFRR 470, 166 micron improvement
1000:1 ratio
3.32 oz/tank
\$1.87/tank

7) Super Tech Outboard 2-Cycle TC-W3 Engine Oil
Unconventional
(Not ULSD compliant, may damage 2007 or newer systems)
HFRR 474, 162 micron improvement
200:1 ratio
16.64 oz/tank
\$1.09/tank

8) Stanadyne Lubricity Formula
Lubricity Only
Demulsifier, 5% bio-diesel compatible, alcohol free
HFRR 479, 157 micron improvement
1000:1 ratio
3.32 oz/tank
\$1.00/tank

9) Amsoil Diesel Concentrate
Multi-purpose
Demulsifier, bio-diesel compatible, alcohol free
HFRR 488, 148 micron improvement
640:1 ratio
5.2 oz/tank

.....
Multi-purpose
Cetane improver, bio-diesel compatible, alcohol free
HFRR 575, 61 micron improvement

400:1 ratio

8.32 oz/tank

\$1.58/tank

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11) Howe's Meaner Power Kleaner

Multi-purpose

Alcohol free

HFRR 586, 50 micron improvement

1000:1 ratio

3.32 oz/tank

\$1.36/tank

12) Stanadyne Performance Formula

Multi-purpose + anti-gel

Cetane improver, Demulsifier, 5% bio-diesel compatible, alcohol free

HFRR 603, 33 micron improvement

480:1 ratio

6.9 oz/tank

\$4.35/tank

13) Used Motor Oil, Shell Rotella T 15W-40, 5,000 miles used.

Unconventional

(Not ULSD compliant, may damage systems)

HFRR 634, 2 micron improvement (statistically insignificant change)

200:1 ratio

16.64 oz/tank

price: \$0.00

14) Lucas Upper Cylinder Lubricant

Gas or Diesel

HFRR 641, 5 microns worse than baseline (statistically insignificant change)

427:1 ratio

7.8 oz/tank

\$2.65/tank

15) B1000 Diesel Fuel Conditioner by Milligan Biotech

Multi-purpose, canola oil based additive

HFRR 644, 8 microns worse than baseline (statistically insignificant change)

1000:1 ratio

3.32 oz/tank

\$2.67/tank

16) Stanadyne Performance Formula

Multi-purpose + anti-gel

Emulsifier, alcohol free

HFRR 675, 39 microns worse than baseline fuel

1000:1 ratio
3.32 oz/tank
\$1.12/tank

17) Marvel Mystery Oil

Gas, Oil and Diesel fuel additive (NOT ULSD compliant, may damage 2007 and newer systems)

HFRR 678, 42 microns worse than baseline fuel.

320:1 ratio
10.4 oz/tank
\$3.22/tank

18) ValvTect Diesel Guard Heavy Duty/Marine Diesel Fuel Additive

Multi-purpose

Cetane improver, Emulsifier, alcohol free

HFRR 696, 60 microns worse than baseline fuel

1000:1 ratio
3.32 oz/tank
\$2.38/tank

19) Primrose Power Blend 2003

Multi-purpose

Cetane boost, bio-diesel compatible, Emulsifier

HFRR 711, 75 microns worse than baseline

1066:1 ratio
3.12 oz/tank
\$1.39/tank

CONCLUSIONS:

Products 1 through 4 were able to improve the unadditized fuel to an HFRR score of 460 or better. This meets the strictest requirements requested by the Engine Manufacturers Association.

Products 1 through 9 were able to improve the unadditized fuel to an HFRR score of 520 or better, meeting the U.S. diesel fuel requirements for maximum wear scar in a commercially available diesel fuel.

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Products 16 through 19 were found to cause the fuel/additive blend to perform worse than the baseline fuel. The cause for this is speculative. This is not unprecedented in HFRR testing and can be caused by alcohol or other components in the additives. Further investigation into the possibilities behind these poor results will be investigated.

Any additive testing within +/- 20 microns of the baseline fuel could be considered to have no significant change. The repeatability of this test allows for a +/- 20 micron variability to be considered insignificant.

special Thank You to all of the dieselplace.com members who generously donated toward this study and waited longer than they should have for the results.

You folks are the best.

Arlen Spicer, organizer.

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Ranking Additive

HFRR

Score

Improvement

Over

Base Fuel

Blend

Ratio

Dose

Oz. per

26-Gal Tank

MSRP

\$ Cost per

26-Gal Tank COMMENTS

Desired Engine Manufacturers Assoc DESIRED < 460 Desired by the Engine Manufacturers Association

Standard U.S. Standard < 520 U.S. Lubricity Standard for ULSD fuel

Baseline Untreated ULSD #2 Diesel Fuel 636 Baseline fuel used in this study

1 2% REG SoyPower Biodiesel 221 415 50:1 66.56 Market Soybean based bio-diesel

2 Opti-Lube XPD 317 319 256:1 13.00 \$4.35 Multi-purpose + anti-gel, Cetane improver, Demulsifier

3 FPPF RV, Bus, SUV

Diesel/Gas Fuel Treatment 439 197 640:1 5.20 \$2.60 Gas & Diesel - Cetane improver, Emulsifier

4 Opti-Lube Summer Blend 447 189 3000:1 1.11 \$0.68 Multi-purpose, Demulsifier

5 Opti-Lube Winter Blend 461 175 512:1 6.50 \$3.65 Multi-purpose + anti-gel, Cetane improver

6 Schaeffer Diesel Treat 2000 470 166 1000:1 3.33 \$1.87 Multi-purpose + anti-gel, Cetane improver, Emulsifier, bio-diesel compatible

7 Super Tech Outboard

2-Cycle TC-W3 Engine Oil 474 162 200:1 16.64 \$1.09 Unconventional

- (Not ULSD compliant, may damage 2007 or newer systems)

8 Stanadyne Lubricity Formula 479 157 1000:1 3.32 \$1.00 Lubricant, Demulsifier, Detergent, Anti-Oxidant, Corrosion Inhibitor, Alcohol-Free

9 Amsoil Diesel Concentrate 488 148 640:1 5.20 \$2.16 Multi-purpose - Demulsifier, alcohol free, bio-diesel

+ Cetane Boost 575 61 400:1 8.32 \$1.58 Multi-purpose - Cetane improver, bio-diesel compatible, alcohol free

11 Howe's Meaner Power Kleaner 586 50 1000:1 3.32 \$1.36 Multi-purpose -Alcohol free

12 Stanadyne Performance Formula 603 33 480:1 6.93 \$4.35 Multi-purpose + anti-gel - Cetane improver, Demulsifier, Detergent, Anti-Oxidant, Corrosion Inhibitor, Alcohol-Free, 5% bio-diesel compatible

13 Used Motor Oil Shell Rotella T 15W-40
5,000 miles used. 634 + 2
Insignificant 200:1 16.64 \$0.00 Unconventional
- (Not ULSD compliant, may damage systems)

14 Lucas Upper Cylinder Lubricant 641 - 5
Insignificant 427:1 7.79 \$2.65 Gas or Diesel

15 B1000 Diesel Fuel Conditioner
by Milligan Biotech 644 - 8
Insignificant 1000:1 3.32 \$2.67 Multi-purpose, canola oil based additive

16 FPPF Lubricity Plus Fuel Power 675 - 39 1000:1 3.32 \$1.12 Multi-purpose + anti-gel - Emulsifier, alcohol free

17 Marvel Mystery Oil 678 - 42 320:1 10.40 \$3.22 Gas, Oil and Diesel fuel additive
- (NOT ULSD compliant, may damage 2007 and newer systems)

18 ValvTect Diesel Guard
Heavy Duty/Marine Diesel Fuel Additive 696 - 60 1000:1 3.32 \$2.38 Multi-purpose - Cetane improver, Emulsifier, alcohol free

19 Primrose Power Blend 2003 711 - 75 1066:1 3.12 \$1.39 Multi-purpose - Cetane boost, bio-diesel compatible, Emulsifier

Products 13 through 15 had a statistically insignificant effect on the HFRR score compared to the baseline fuel.

Any additive testing within +/- 20 microns of the baseline fuel could be considered to have no significant change. The repeatability of this test allows for a +/- 20 micron variability to be considered insignificant.

DIESEL FUEL LUBRICITY ADDITIVES STUDY RESULTS

Products 1 through 4 were able to improve the unadditized fuel to an HFRR score of 460 or better. This meets the strictest requirements requested by the Engine Manufacturers Association.

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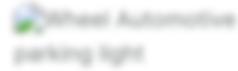


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