



The following test was conducted using the EcoSave Catalyst product.

Engine: Deutz Diesel 4 cyl 150 HP with Bosch common rail injection, using a "hook up" dynotester on the PTO of the Tractor.

Due to the "pulsations" in the dynotester, when trying to run at 12-15-1800 rpm, the decision was made to run at 2150 rpm (max rpm).

SMOKE ANALYSER IN USE: Opus 50. Metering **k** and **op** values.

Baseline test (only diesel):

First test, without product was run for a fuel / emission test at 70 hp-2150 rpm for 30 minutes. 10 minutes after the start of the test emission and turbo temperature was taken. 15 minutes after, new emission and temperature test taken.

70 hp-2150 rpm for 30 minutes - fuel used 9,0 litres - (checked by filling up the tank)

After 15 minutes of checking result, a new test began with 120 hp-2120 rpm for 40 minutes. Emission and temperature tests were performed at 10 + 15 minutes.

120 hp-2120 rpm for 40 minutes - fuel used 16, 6 litre - (checked by filling up the tank)

Full throttle test reading 147.9 hp

Conditioning:

A treatment period of only 2, 5 hrs.

The engine was set at 120 hp using 0, 3 litre "EcoSave Catalyst" mixed in 100 litre of diesel.

Product test (diesel + EcoSave):

Second test began with an "EcoSave Catalyst" content of 1:2000 by volume.

70 hp-2150 rpm for 30 minutes - fuel used 8, 2 litres - (checked by filling up the tank)

120 hp-2120 rpm for 40 minutes - fuel used 16, 2 litres - (checked by filling up the tank)

Full throttle test resulting in no gain in power.

Gas analyser results

	<u>70 hp only diesel</u>	<u>70 hp EcoSave</u>	<u>120 hp only diesel</u>	<u>120 hp EcoSave</u>
A	k-0,03 l/m Op-1,4%	AI k-0,02 l/m Op-1,0%	C k-0,07 l/m Op-3,0%	CI k-0,02 l/m Op-0,9%
B	k-0,02 l/m Op-1,0%	BI k-0,02 l/m Op-0,7%	D k-0,03 l/m Op-1,1%	DI k-0,01 l/m Op-0,3%
Average:	k-0,025 l/m Op-1,2%	k-0,02 l/m Op-0,085%	k-0,05 l/m Op-2,05%	k-0,015 l/m Op 0,06%

Conclusion: The clear winner is the environment. The emission dropped right from the beginning of the "EcoSave" test session and dropped by more than 90%. Fuel savings showed up to 9%. The exhaust temperature was slowly creeping down towards the end of the test. With more mileage the carbon deposits will decrease, resulting in an even cleaner and more fuel efficient engine.

Test conducted by:
Martin Schanche Racing

Martin Schanche
Drøbak, 14-11-09

The following test was conducted using EcoSave Catalyst

Engine:

- ◆ Deutz Diesel 4 cyl 150 HP with Bosch common rail injection, using a “hook up” dynotester on the PTO of the Tractor.
- ◆ Due to the “pulsations” in the dynotester, when trying to run at 12-15-1800 rpm, the decision was taken to run at 2150 rpm (max rpm).
- ◆ SMOKE ANALYSER IN USE. Opus 50, metering k and op values.

The original engine was run for a fuel / emission test at 70 hp-2150 rpm for 30 minutes.

10 minutes after the start of the test emission and turbo temperature was taken.

15 minutes after, a new emission and temperature test taken.

Fuel used 9.0 litres, checked by filling up the tank.

After 15 minutes of checking result, a new test began with 120 hp-2120 rpm for 40 minutes.

Emission and temperature tests were performed at 10 + 15 minutes.

Fuel used 16.6 litre, checked by filling up the tank.

Full throttle test reading 147.9 hp

A treatment period of only 2.5 hrs.

Was run at 120 hp using 0.3 litre EcoSave mixed in 100 litre of diesel fuel.

The second test began with an EcoSave content of 1:2000 by volume.

70 hp-2150 rpm for 30 minutes – fuel used 8.2 litres

120 hp-2120 rpm for 40 minutes – fuel used 16.2 litres

Full throttle test resulted in no gain in power.

Gas analyser results

<u>70 hp standard</u>	<u>120 hp standard</u>	<u>70 hp Eccosave</u>	<u>120 hp Eccosave</u>
<u>A</u> k-0,03 l/m Op-1,4%	<u>C</u> k-0,07 l/m Op-3,0%	<u>AI</u> k-0,02 l/m Op-1,0%	<u>CI</u> k-0,02 l/m Op-0,9%
<u>B</u> k-0,02 l/m Op-1,0%	<u>D</u> k-0,03 l/m Op-1,1%	<u>BI</u> k-0,02 l/m Op-0,7%	<u>DI</u> k-0,01 l/m Op-0,3%
Average: k-0,025 l/m Op-1,2%	k-0,05 l/m Op-2,05%	k-0,02 l/m Op-0,085%	k-0,015 l/m Op 0,06%

Conclusion of the test shows that the winner is the emission drop right from the beginning of the “EcoSave” test session.

The exhaust temp was slowly creeping down towards the end of the test.

With more mileage the carbon deposits will decrease, resulting in an even cleaner and more fuel efficient motor.

Martin Schanche Racing

Martin Schanche
Drøbak, 14-11-09

Protocol of Test Conducted in Norway, 2009

This is the protocol used a test in Norway conducted by Martin Schanche Racing:

Engine:

Turbo diesel, intercooler

Compress/ignition

6 cylinders, 150-170 HP

Baseline:

Run 3 power tests as baseline with fixed loading and RPM.

1. 50 HP / 1200 RPM
2. 75 HP / 1500 RPM
3. 100 HP / 1800 RPM

Then run a FULL power test to see how many HP the engine can produce.

Conditioning:

Run a full tank (10 gallon) using double dosage.

Product test:

- Use normal dosage and run the same tests again
1. 50 HP / 1200 RPM
 2. 75 HP / 1500 RPM
 3. 100 HP / 1800 RPM
- Run a FULL power test to see how many HP the engine can produce.
 - During both baseline and product test, measure emissions and fuel usage. Fuel usage will be measured from the injector duty cycle in milliseconds but also from the tank itself.
 - Measure the exhaust temperature, during the entire test to be able to compare.