Team for intelligent technical solutions.

AUA Ltd.

Fuel consupmtion and polution reducer.

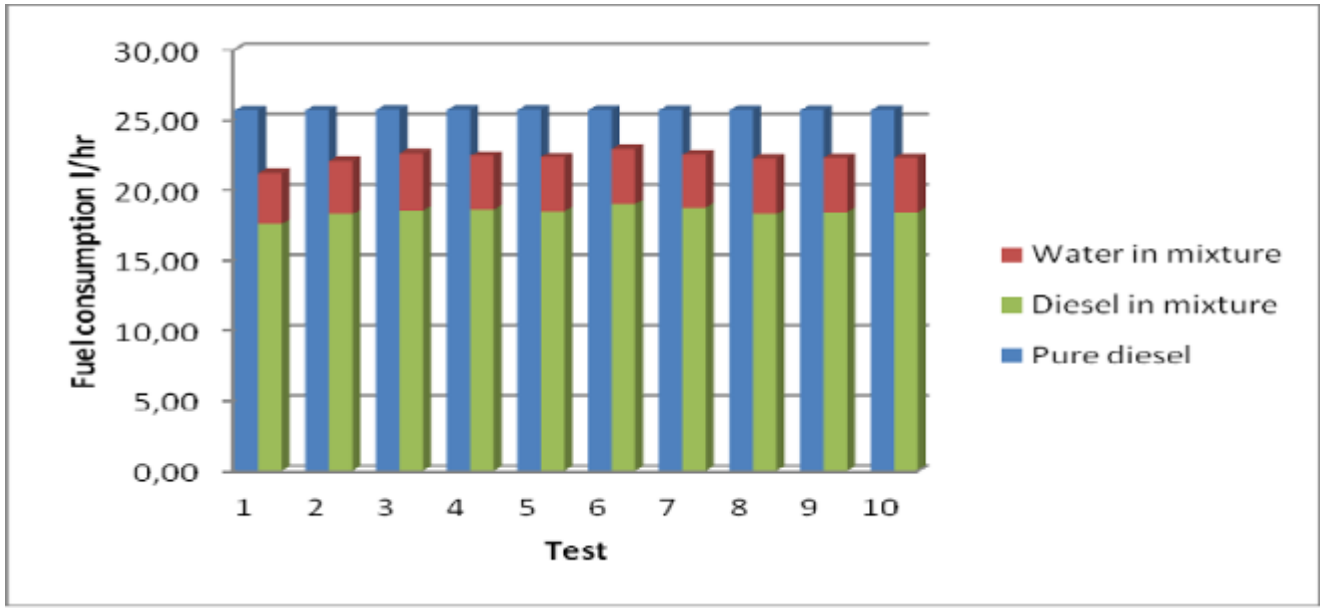
Application and usage

- Fuel consumption and pollution reducer are applicable to all kind of internal combustion engines
- Power stations
- Oil heating systems
- All big consumers of fossil fuels

Best results of the fuel savings we can get on large consumers

Savings calculation example

- Results of testing fuel and pollution saving unit, preformed by Technical College of Reykjavik, Iceland.



The concept

- Most important questions for existing and future transportation users are:
- pollution reduction
- fuel consumption reduction
- safety
- prolonged engine life
- Reduce of maintenance costs

Exsample for savings on fuel consumption

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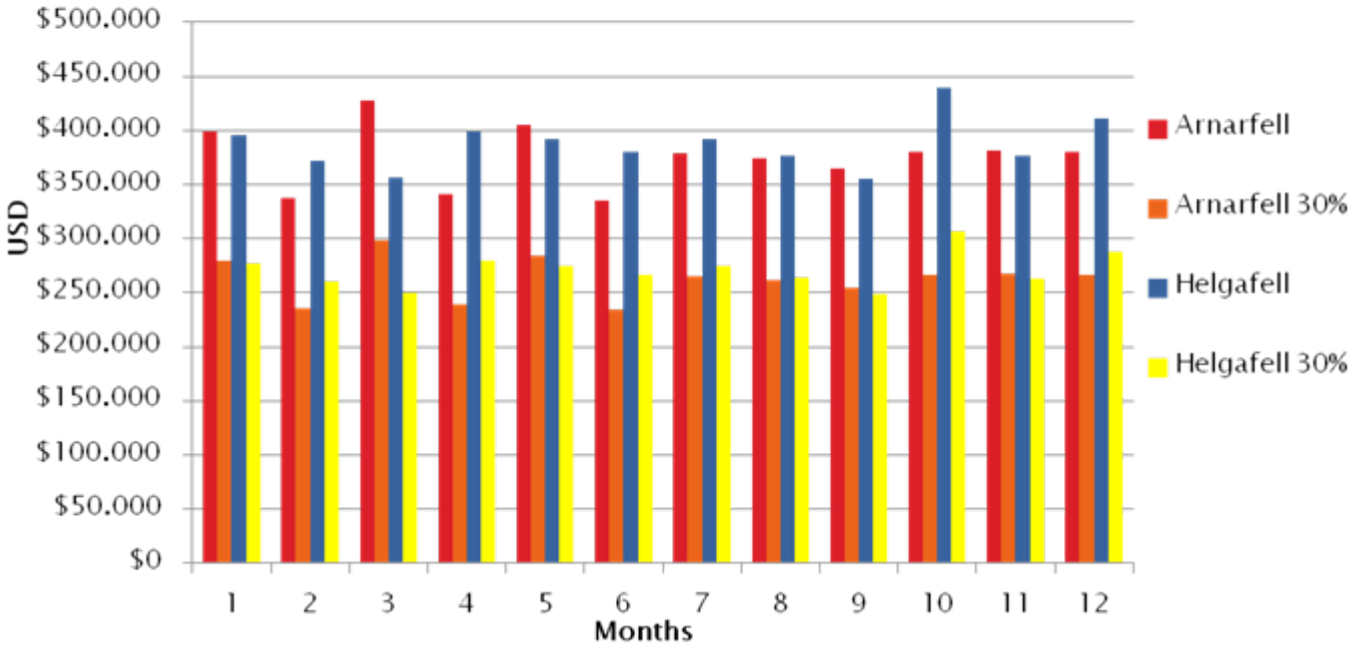
Calculate savings per year for two cargo ships
with propusion 8400 kW MAN 7 L 48/60 B



Fuel water blender

Benefits:

- Device needs to be attached to a fuel system of internal combustion engine
- Principle of operation is increasing the combustion efficiency of fuel in all kind of internal combustion engines
- Increased engine life
- Increased thermal efficiency
- Device prolongs lifetime of certain parts in a engine and doesn't reduce power of an engine
- Internally cleaner engine
- Fast and easy installation – use of existing oil and water supply
- Can be used with all heavy oils – can be built for the ships and even bigger engines
- Small footprint dimensions
- Abillity to generate carbon credits

Fuel water blender

- Savings that are realized on fuel consumption will be over 20%, depending on the type of engine
- Pollution reducing up to 40% – significant reducing of the NOX
- Eliminates particles from the emission
- Reduces maintenance frequency
- Device prolongs lifetime of certain parts in a engine and doesn't reduce power of an engine
- Internally cleaner engine

Test result provided by Icelandic College of Marine Engineering

Test results performed from a patented invention by Mr. Antonijo Licitar.

This invention is based on mixing fossil fuel with water, resulting in saving fuel and minimising air pollution.

The following were participants in this experiment and verify that all details in the report are authentic.

The Icelandic College of Marine Engineering:

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Sign Hjörtur B Björnsson

The present invention is a creation and design by Mr. Antonijo Licitar, who has been working on this invention for the past four years. These tests were designed to test the theory that this invention could reduce the fuel consumption of diesel engines significantly and reduce pollution.

Approximately one year ago, Mr. Arni Benony Sigurdsson and Unnar Eyjolfsson joined Mr. Antonijo Licitar in perfecting his invention. The invention was registered last year 2011 as a world wide patent by the Icelandic lawyers Arnason Factor EHF, who are specialized in patents and labeled goods. Following this procedure a limited liability company AUA ehf was formed in Iceland with the above three persons as main shareholders and owners of the patent.

In order to fully test the patent we got in touch with the Head Master of The Icelandic College of Technical Marine Engineering Mr. Egill Gudmundsson, who with open arms, allowed us to use the facilities of the Collage and appointed one of his most experienced teacher Mr. Sigurdur Ingi Andresson, who has great experience in water oil tests as the leader from his side of the project. He in turn, appointed two of his last year students Mr. Teitur Helgason and Mr. Hjortur Bjorn Bjornsson as his full time participants and observers in the project. They will write a special report of their experience as part of their graduation. Mr. Antonijo Licitar and Mr. Unnar Eyjolfsson Engineer were the leading parties in the project from the company AUA ehf. The last three months of the experiment was exhausting and all parties involved showed great stamina and work, in completing all tests and prove that this patent works.

The Icelandic College Of Technical Marine Engineering is a private institution owned by the following Icelandic business organizations; The Federation Of Icelandic Fishing Vessel Owners, The Federation Of Icelandic Industries, Samorka – Icelandic Energy & Utilities and The Icelandic Ship Owners Association.

The present invention is a creation and design by Antonijo Licitar. These tests were designed to test the theory that this invention could reduce the fuel consumption of diesel engines significantly.
These test showed great results in fuel consumption and additionally in those tests the exhaust was measured, showing good results in lowering pollution emission.
All tests were performed by Unnar Eyjólfsson, Teitur Helgason and Hjortur Bjorn Bjornsson
Teitur and Hjörtur are currently finishing marine engineering at The Icelandic College of Technical Marine Engineering, Reykjavik

About the unit

The present invention (hereby know as the fuel processor) uses water in oil emulsification to reduce the amount of fossil fuel usage in combustion engines in, ships, power plants and other working engines.(cars and trucks in the future.) It not only saves fuel, it reduces pollution, prolongs engine life and service intervals due to less unburned carbon particles in the combustion chamber.

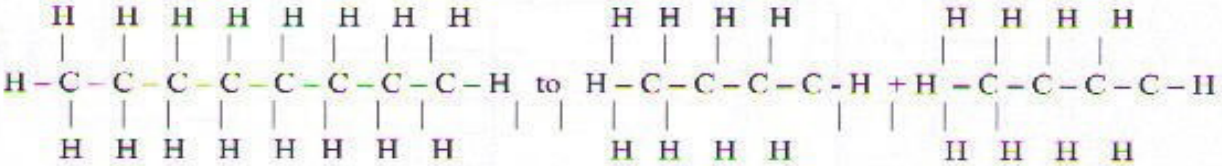
The fuel processor uses a novel method of blending water and diesel fuel together and making a mixture that saves fuel, reduces pollution and gives better performance.
It blends the two different liquids on a molecular level and leaves no particles of water in the fuel that could decrease the flammable point or create problems in the combustion chamber.

The process eliminates usual problems with water/fuel mixing such as condensation in the cylinders, water particles in lubricating oil, increased pressure in fuel delivery system and lower lubrication of fuel delivery system.

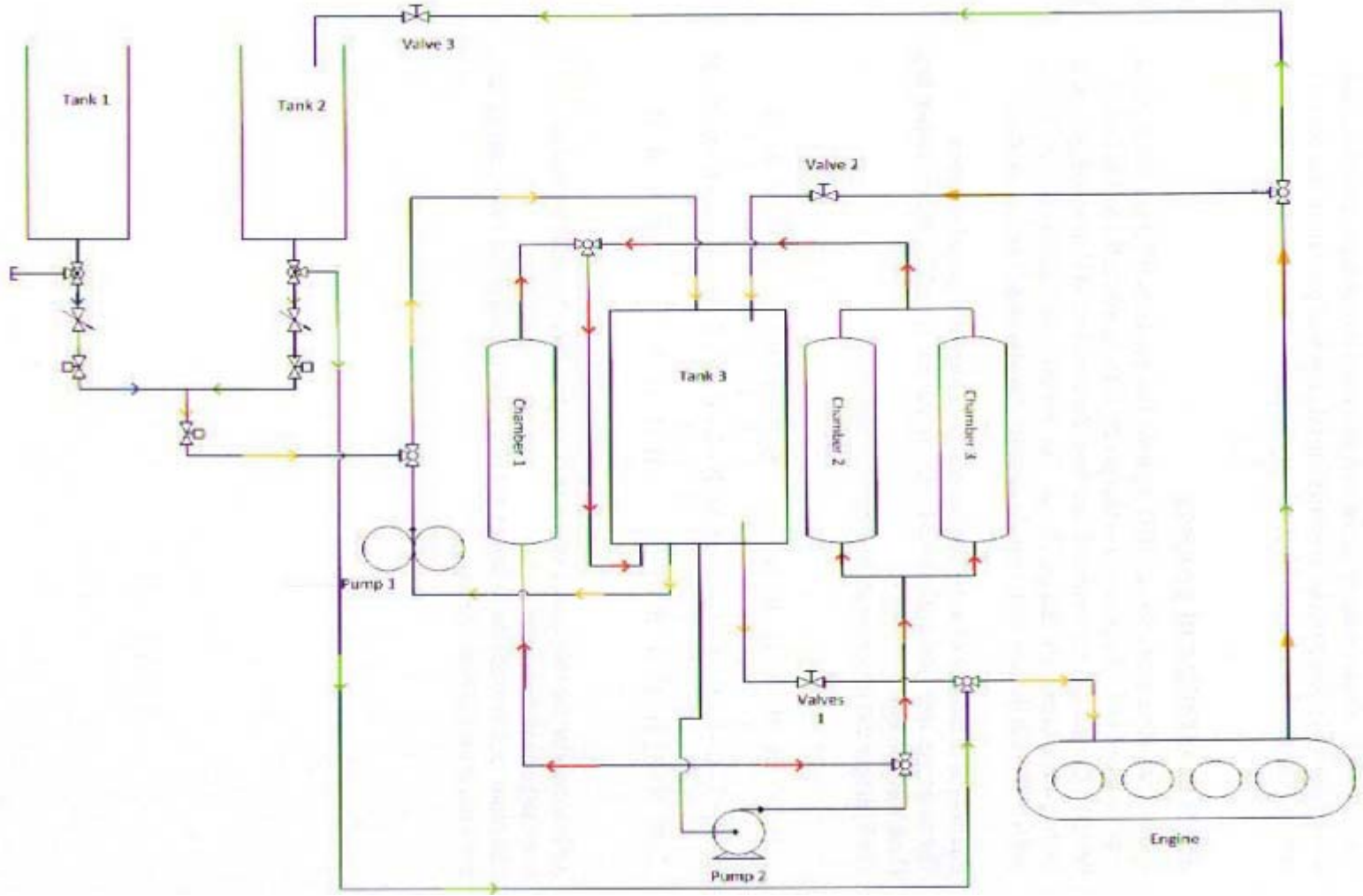
Short description of process

The fuel processor uses a special H2O separator that produces HHO gas that is mixed with the diesel fuel. The process overcharges the H molecules in the fuel and when the HHO gas and fuel are combined ions from the overcharged H molecule goes from the fuel to the negatively charged H2 gas. The mixture is achieved by running the gas and fuel through the processor again to complete the cracking of carbon molecules.

Electrolysis of mixture of water and fuel was performed in a special seporator
The water was split from H_2O into $2H^+ + O^{2-}$ (some into $H^+ + OH^-$) and the carbon fuel chain was also split
The hydrogen can then connect into the fuel chain.



After some time the split chains returns to its original state, but until the fuel is overcharged with hydrogen
The connection between the hydrogen and fuel chain is strenghtent by circulating the gas through the oil/water mixture


Valve 3
Tank 1
Tank 2
Valve 2
Tank 3
Chamber 1
Chamber 2
Chamber 3
Pump 1
Valves
1
Engine
Pump 2

Test procedure

Fuel consumption test:

Test machine 1.
Ingesoll Rand R1300F14115
John Deere engine
Technical specs:
127 KW @ 2500 RPM
MY 2006
Running time 283 hours.
Attached is an Ingesoll Rand air compressor with 15 bar working pressure.

To get varied fuel consumption the machine was tested in three different stages.
All stages were done with the engine started and run up to operational temperature on unmixed diesel fuel.
The backflow from the diesel injection was delivered to the corresponding tank of fuel the engine was using (pure diesel or mixture)
Switching between fuel tanks was done using ball valves on the fuel line and the backflow line (see drawing 1).
Backflow was timed to see how long after switching the fuel line to mixture tank the mixture would flow back. Measured time was 45 seconds.
In all tests, backflow was switched from diesel tank to mixture tank 45 sec. after the fuel line was switched from diesel to mixture. This was done to get more accurate results in measuring the fuel consumption.

The three stages the machine was run in are as follows:
Stage 1: Machine at operational temperature, running at 1500 rpm, compressor maintaining 5 bar pressure in onboard tank.

Stage 2: Machine at operational temperature, running at1500 rpm, compressor maintaining 15 bar pressure in onboard tank.

Stage 3: Machine at operational temperature, running at 2400 rpm, with fully open air valves and compressor working on full power trying to maintain 15 bar pressure.

Tests were run at all three stages and for various periods of time. All results are calculated from test times to fuel consumption per hour.
All measurements were read from mm scale on fuel, water or mixture tanks.
Calculation of fuel/mixture consumption was calculated based on tank sizes.

To access the mixtures influence on the machine heat measurements were performed throughout the tests. All temperatures were measured with an infrared heat gun pointed at various locations.
Following temperature measurements were taken:
Engine block temperature
Cylinder head temperature
Lubricating oil temperature
Exhaust temperature
Turbocharger temperature

All measurements showed either no change in temperature or slightly lower measurements.

Test machine 2.
Cummins diesel engine
V8 210 Type, GO41916
Technical specs:
187 Bhp @ 3000 RPM
Attached is a generator Markon Engineering type: B46413
100 KVA @ 1500 RPM
380-415 Volt 152-139 Ampere 50 Hz

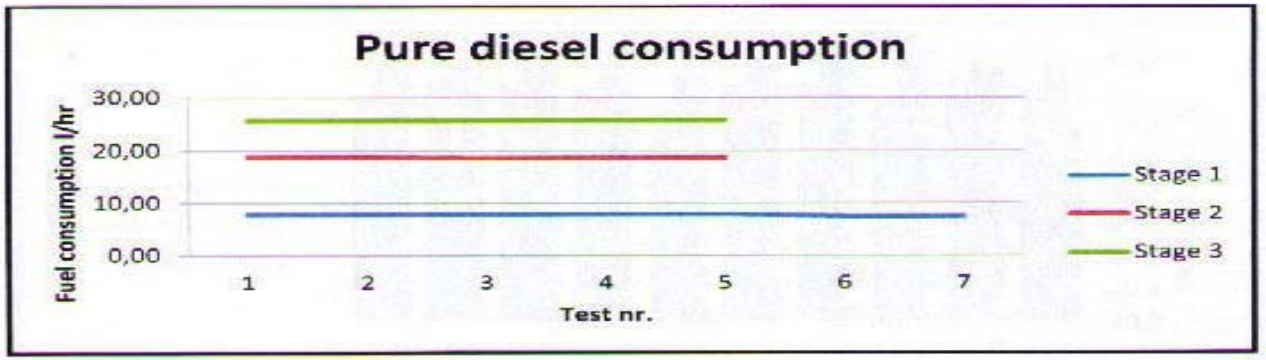
To get varied fuel consumption under load the machine was tested with two different loads, 20kW and 40kW.
Both loads were done with the engine started and run up to operational temperature o unmixed diesel fuel.

These tests were designed to get an accurate power measurement on the power output of the mixture.

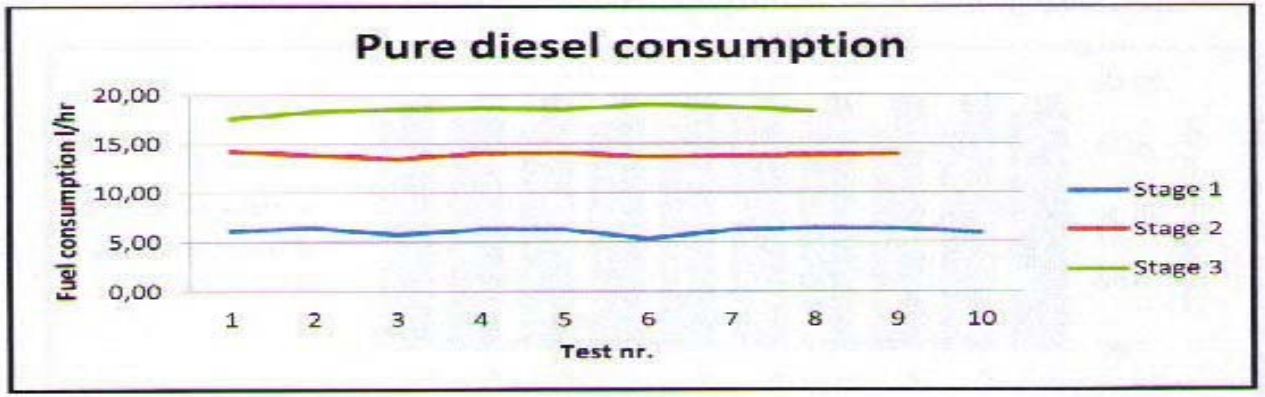
Since time with the machine was limited the main goal was to show that the machine could generate the same amount of power on diesel and mixture.
Measurements were taken on one test of pure diesel, six tests on 20kW load and four tests on 40kW load.

Test results

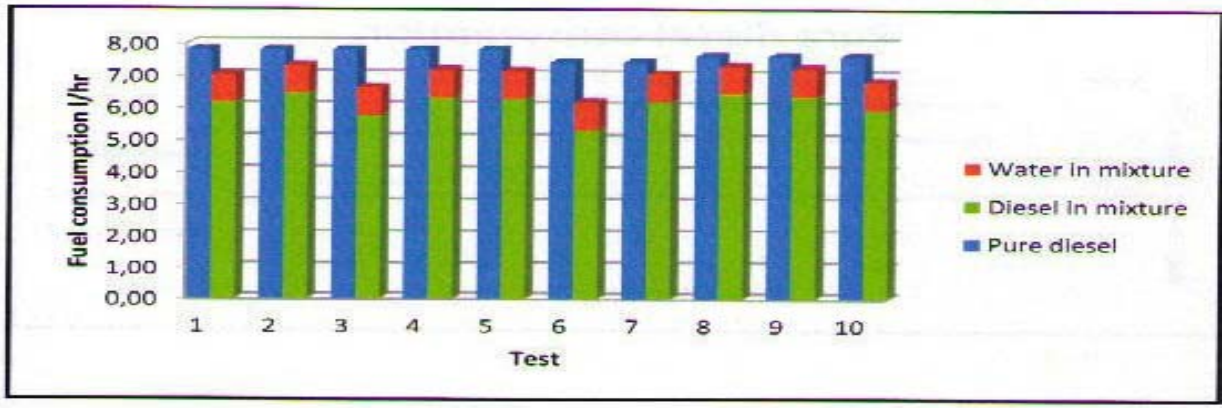
Picture 1:
Machine 1, total fuel consumption on pure diesel.



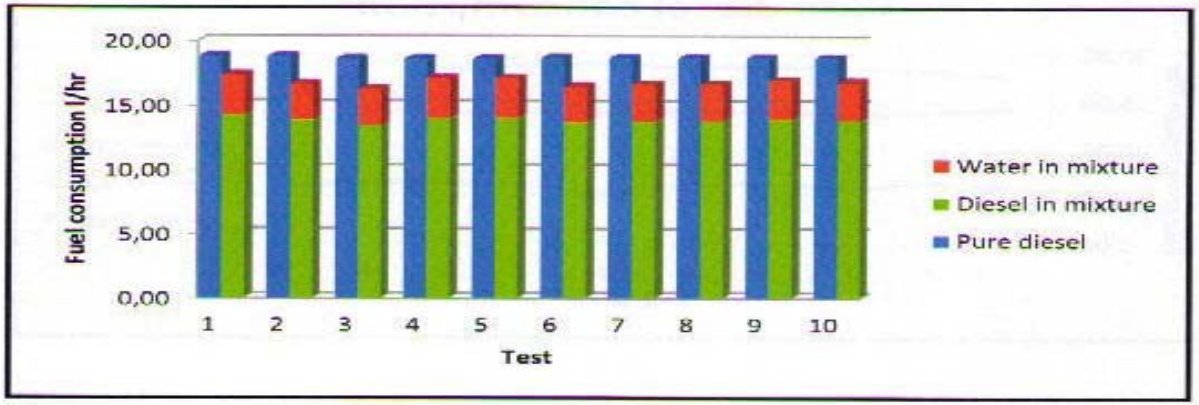
Picture 2:
Machine 1, total diesel consumption after fuel processor



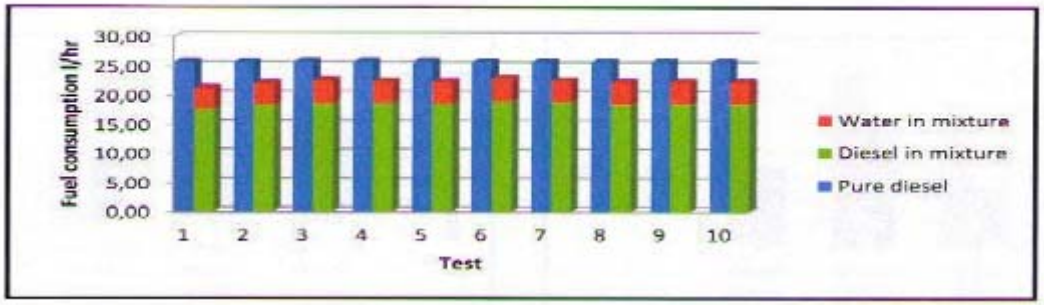
Picture 3:
Machine1, stage 1, total fuel consumption, diesel and water volume in mixture.



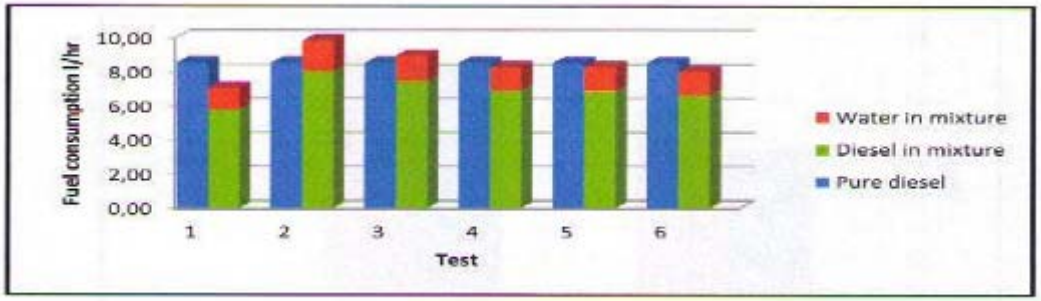
Picture 4:
Machine1, stage 2, total fuel consumption, diesel and water volume in mixture.



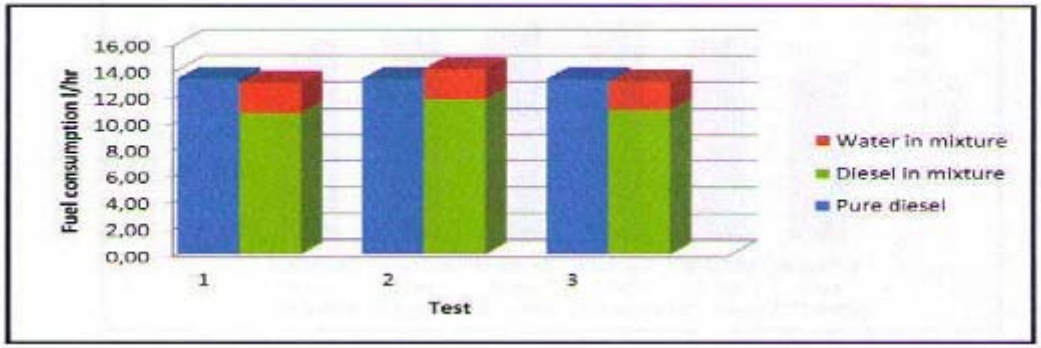
Picture 5:
Machine1, stage 3, total fuel consumption, diesel and water volume in mixture.



Picture 6:
Machine2, load 20kW, total fuel consumption, diesel and water volume in mixture.

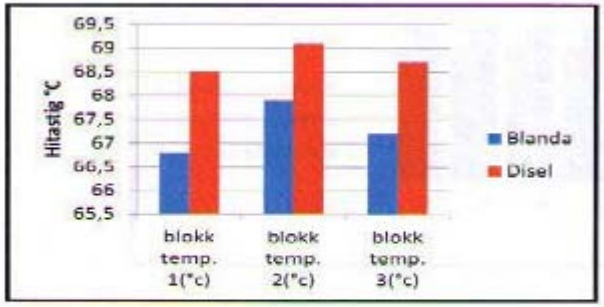


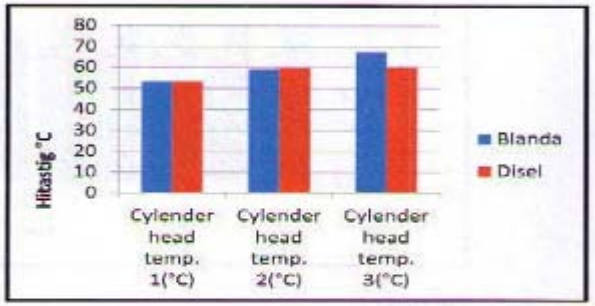
Picture 7:
Machine2, load 40kW, total fuel consumption, diesel and water volume in mixture.

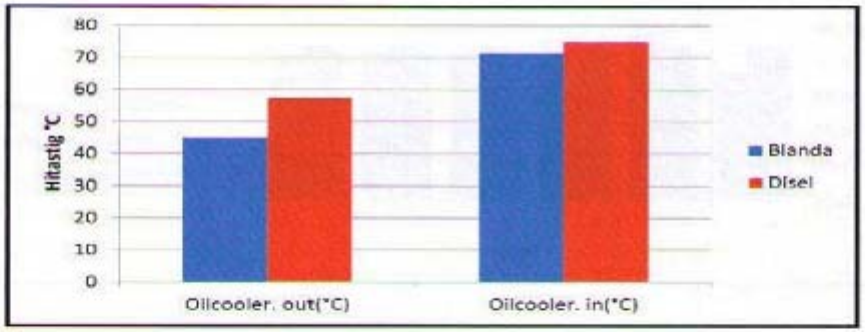


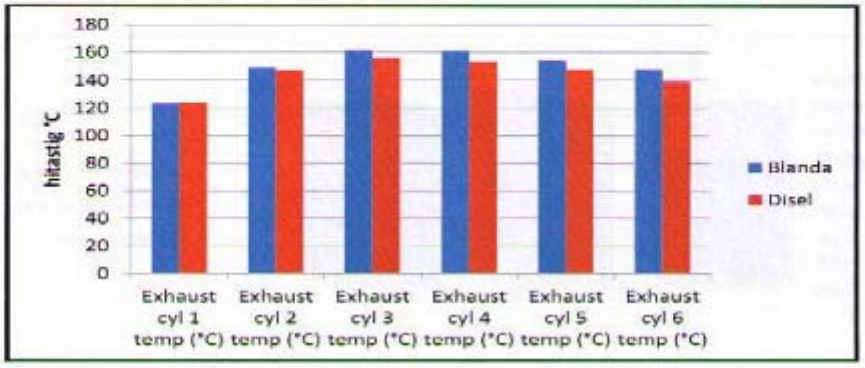
Heat

Minimum load



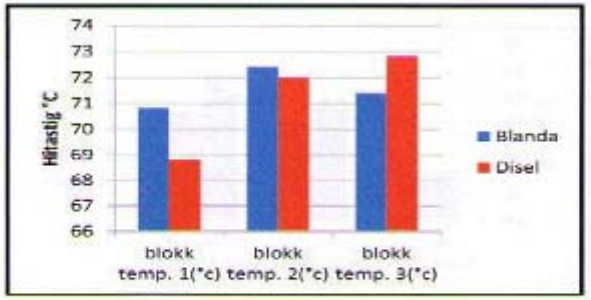


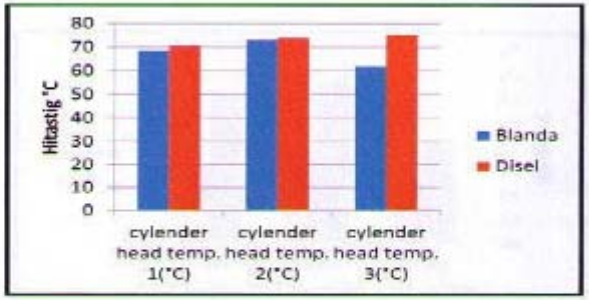


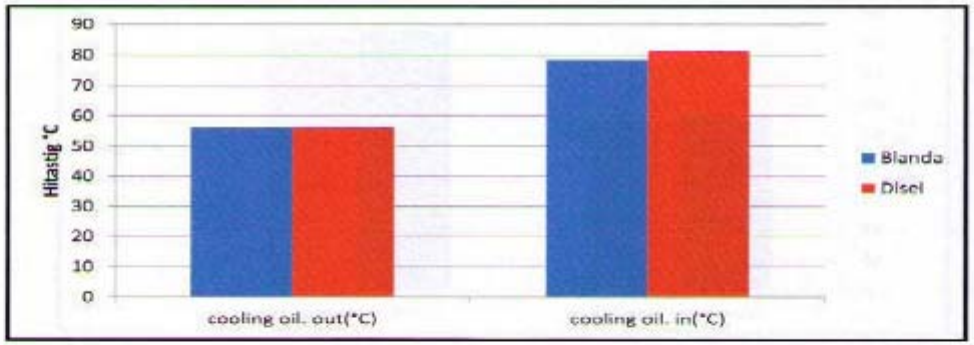


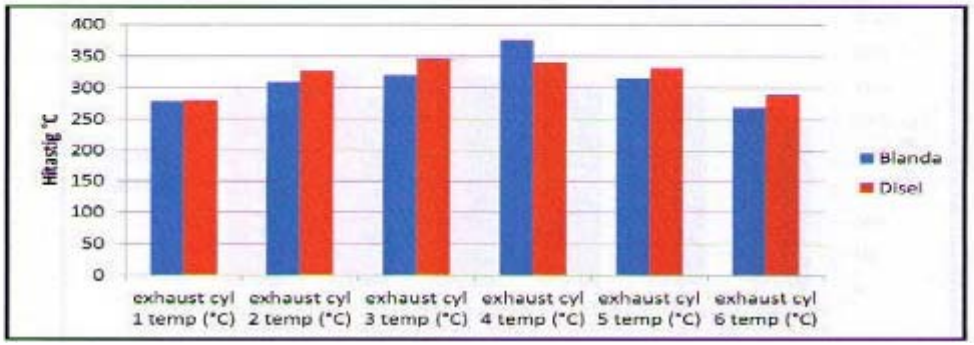
Heat

Full load

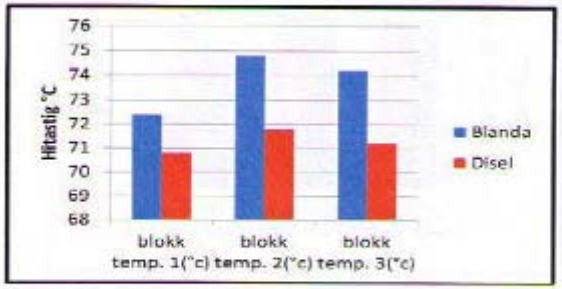


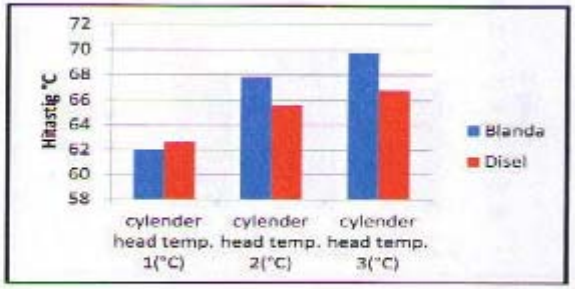


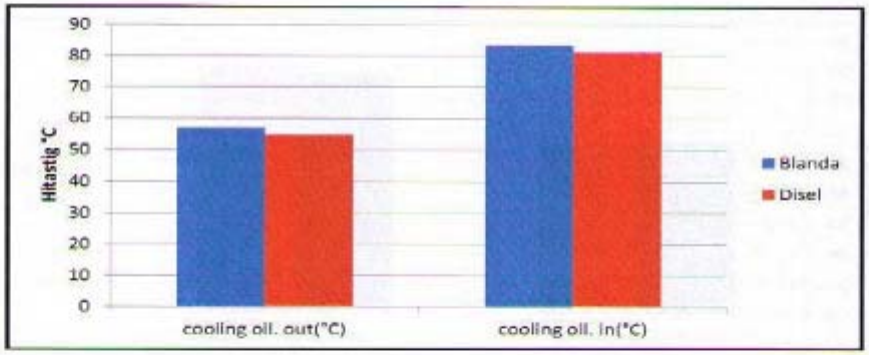


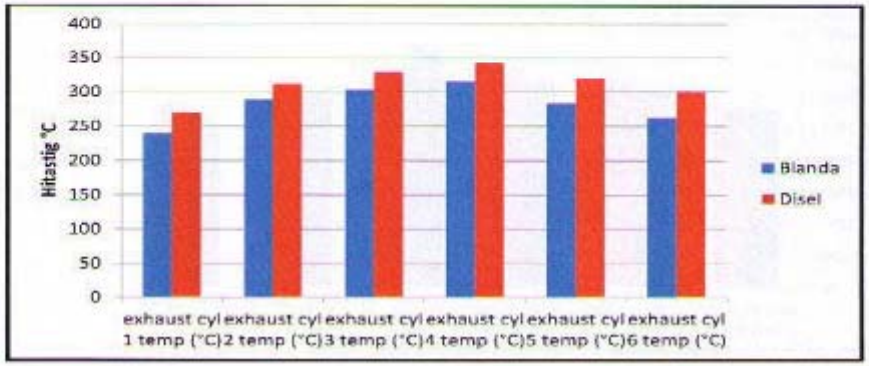


Heat
Half load









Conclusion

These test show that the fuel processing unit can perform as expected, total fuel consumption was lowered and significant diesel savings were shown. No loss of power was detected while running on mixture and the testing showed no ill effects on the machine over the period of tests.
On average our fuel consumption was lowered significantly.
The average results of the tests shown in the charts were:

Stage 1:
Total usage down 8,9%
Pure diesel usage down 20,3%
Water used in mixture 12,5%

Stage 2:
Total usage down 10,1%
Pure diesel usage down 25,9%
Water used in mixture 17,6%

Stage 3:
Total usage down 13,3%
Pure diesel usage down 28,2%
Water used in mixture 17,2%

The exhaust measurements were very positive, significant lower NOX and CO2 values were in the emission while the engine was running on the mixture.

Even though the number of tests could have been greater it shows that the fuel processor works and is now ready for further testing and adjustments.

The students Mr. Teitur Helgason and Mr. Hjortur Bjorn Bjornsson concluded the following and made a chart statement in an oil saving scheme on two ships operated by the Icelandic shipping line Samskip, Helgafell and Arnafell (calculations in US dollars).

Possible effect on the engines.

The fuel processor should not have any great effect on the engines, the temperature on the engines did not increase in any significant measure. The slight increase in heating has no ill effect on the engines. Tests on long term bases need to be done, to gather what effect the water – oil blend has on engines. Extra pressure could be on the exhaust valve and the head gas get.

The heat measurements were performed with an infrared heat gun. It is not a calibrated and certified measuring device, therefore any results and conclusion must take that into account

Our believe is that the fuel processor works best under constant conditions like on ships and in power stations. Our testing showed best results regarding heat and fuel savings, when the engines where running under constant pressure. Further tests should be done under fluctuating pressure.

The fuel processor will drastically change life for those using engines using fossil fuel that is the big issue in the world today. It will significantly reduce consumption and pollution emission.

The exhaust fumes measuring devices were changed during the testing because of failure in the first device. Therefore the results, as promising as they were, could be skewed and the values are not presented in this document.

ARNASON | FAKTOR
INTELLECTUAL PROPERTY CONSULTING

- STATEMENT OF FILING A PATENT APPLICATION
- To whom it may concern
- On behalf of AUA ehf., Arnason Faktor filed a priority founding patent application for
- an invention called „Water blended fossil fuel“. The application was filed on 25.
- November 2011 and has the application number IS 050022.
- Enclosed is an acknowledgement of receipt from the Icelandic PTO
- (Einkaleyfastofan – ELS) specifying the application number and date of filing.

- Arnason Faktor
- Sigurður Ingvarsson