



Maritime Testing

Trial 1

Three diesel-powered barges carrying goods in the Netherlands were tested for the effect of OptiFuel™ on emissions as well as fuel economy as part of a larger test comparing the effectiveness of a variety of fuel additives. The test was carried out by researchers at Eindhoven University of Technology using onboard emissions and fuel use testing equipment.

The three barges were operated for a month to determine baseline emissions and fuel economy. Subsequently, the barges were operated with fuel dosed with OptiFuel™ and operated for an additional 50 days.

Barge Emissions and Fuel Consumption, recorded as %Reduction from Baseline Values								
	%Reductions after 3 days				%Reductions after 50 days			
	NO _x	CO ₂	Soot	Fuel	NO _x	CO ₂	Soot	Fuel
Barge 1	11.8	2.4	25.0	2.4	22.0	8.5	60.5	8.5
Barge 2	41.5	3.1	34.5	3.1	50.5	8.1	55.0	8.1
Barge 3	20.0	2.1	28.0	2.1	30.0	7.0	57.5	7.0
Avg. %Reduction	24.4	2.5	29.2	2.5	34.2	7.9	51.9	7.9

Trial 2

A transport ferry operating on bunker fuel (as opposed to diesel) operated 7 days a week between the Patras on the Greek coast and Bari on the Italian coast, delivering people and their automobiles from one port to the other and back.

Bunker fuel has a very high viscosity, even when heated and stored in the ship's day tanks. For this reason, OptiFuel™ had to be injected directly into the fuel line, as testing indicated it would not mix effectively with bunker fuel otherwise. This was accomplished by tapping into the fuel delivery line with a pump calibrated to deliver OptiFuel™ at the manufacturer recommended dose rate. Immediately after being dosed, the fuel/OptiFuel™ mixture entered the fuel centrifuge, which separates out water and unwanted solids from the bunker fuel. The action of the centrifuge achieved thorough mixing of OptiFuel™ into the bunker fuel.

Technical difficulties prevented research personnel from being able to test for a full panel of emissions, however CO₂, CO, and Unburned Hydrocarbons (UHCs) emission data was able to be retrieved. The ship was initially operated for two weeks without OptiFuel to determine average baseline emissions, with emission data being collected every 7 seconds while the engine was in operation.

After two weeks of operation, the OptiFuel pump was turned on and the fuel was dosed. At the end of a two week period, the average emissions were determined as before, with emissions data collected every 7 seconds during while the engine was in operation. The results are tabulated below.

Ferry operating on Bunker Fuel, traveling between Patras, Greece and Bari, Italy			
	CO₂, %	CO, ppm	UHCs, ppm
Baseline	5.69	121.24	16.15
Test	5.35	89.72	15.08
%Reduction	5.9	26.0	6.6