

## HOW TO EVALUATE YOURSELF THE XBEE BIOTECHNOLOGY?

There are several parameters that can be monitored, looked after and calculated to measure the impact of the Xbee enzyme biotechnology in the fuel.

The action of the Xbee enzymes is to purify the fuel \_ eliminating bacteria, sludge, water presence in the fuel. The consequence of using an improved diesel oil or heavy fuel oil is a natural cleansing effect of the fuel system and engines \_ enzymes still acting to remove carbon deposits and other contaminants.

The further consequences of that cleansing effect is the reduction of the smokes and implied gas emissions. Finally, those parameters result in reducing the fuel overconsumption.

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### How to notice the results?

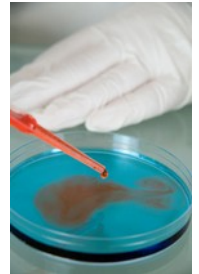
#### 1 ) Bacteria:

Xbee enzymes remove water in the fuel and disperse bacteria, such organisms are burnt naturally with the fuel that is cleaned up completely after a few weeks of treatment.

There are two methods to measure the impact of the biotechnology regarding the bacteria issue:

it is possible to analyze the fuel before the first treatment with Xbee and a couple of samples after one- & two- months of using Xbee fuels;

it is also possible to take pictures of the bacteria content in the filters before the first treatment and simply check the absence of the said bacteria after a month or two of using Xbee fuels.



#### 2 ) Tanks:

Xbee enzymes purify the fuel, disperse sludge and contaminants in the tanks and from the tanks sides. The cleansing is done in the main storage tanks first, then the settling tank and finally the daily tank.

The best method, although it has no scientific background, is the most objective for a technical engineer: detailed pictures of the tanks should be taken prior to the use of Xbee, and comparative pictures should be taken at least six months after the first treatment with the biotechnology.

The cleanness of tanks filled with Xbee fuel is remarkable and can be easily noticed. Fuel samples can be analyzed before and after to bring scientific data to the method.

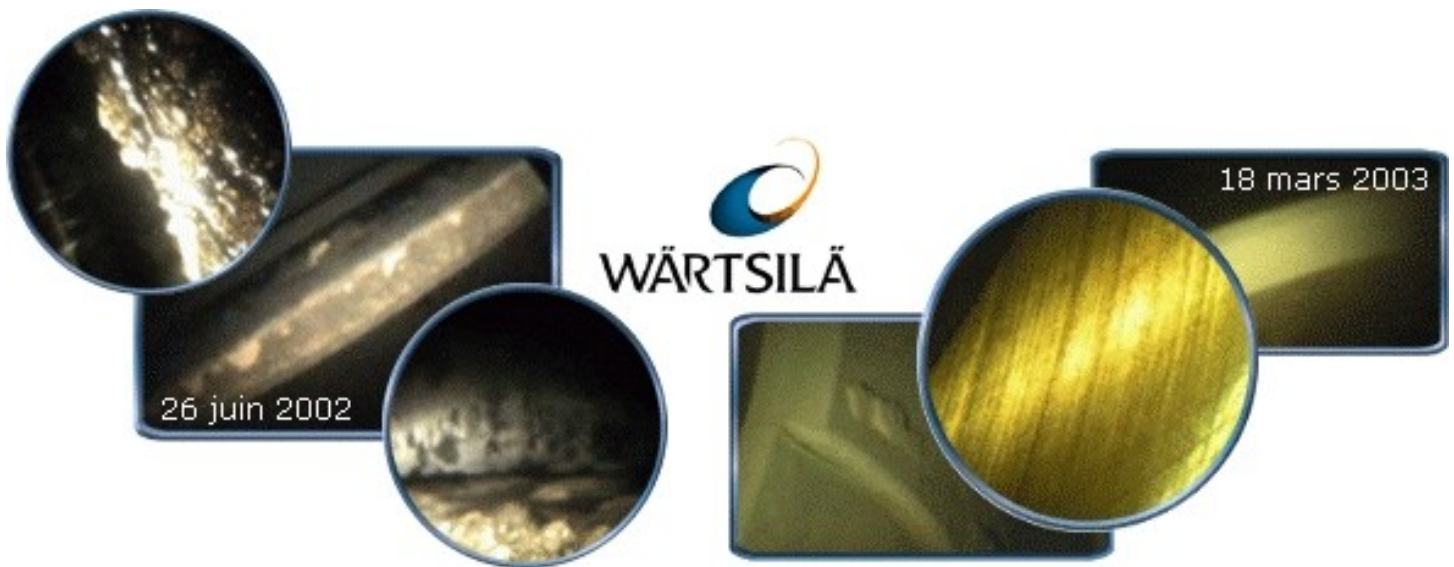


### 3 ) Engine:

A cleaner fuel do not pollute anymore the fuel system and the engine. Moreover, the enzymes keep working up to several million times per second to break the contaminants, including the carbon deposits.

The most effective method to measure the cleansing effect of the biotechnology in the engine is to use Xbee fuel during at least six months before a complete overhaul during which it is possible to compare pictures, maintenance reports, spare parts budgets, etc.

Within the period of evaluation, it is possible to use endoscopic equipments to take a look at valves, pistons, etc. and see the evolution month after month.



### 4 ) Exhausts:

A cleaner engine naturally performs better, burns more completely the fuel. The consequence is a reduction of the volume of gas at the exhaust, a reduction of air pollutants within the gas emission and a reduction of lost heat. This translates quickly in less Carbon Monoxide and Dioxide, Nitrogen Oxide and Dioxide, Sulfur Oxides, Particles . . .

The first changes can be checked within a couple of weeks of using the Xbee biotechnology just by checking the volume and color of smokes that will decrease and lighten the days going by.

The most effective and reliable method to control the evolution of the exhausts is to either install an analyzer onboard or call for the service of an accredited laboratory that can measure the different gases in detail. Two measure are necessary in that case: a baseline before using Xbee and at least one comparative measure after a couple of months of regular use of Xbee fuels.

# Diesel EN 590 #	Without Xbee	With Xbee	Difference (%)
Flow (Nm <sup>3</sup> /h)	151.60	104.80	<b>-30.87</b>
CO <sub>2</sub> – Carbon Dioxide (%)	1.52	1.36	<b>-10.53</b>
CO – Carbon Monoxide (mg/Nm <sup>3</sup> )	342.20	262.60	<b>-23.26</b>
NO – Nitrogen Oxide (mg/Nm <sup>3</sup> )	415.60	380.60	<b>-8.42</b>
NO <sub>x</sub> – Nitrogen Dioxide (mg/Nm <sup>3</sup> )	821.20	719.40	<b>-12.40</b>
VOC – Volatile Organic Compounds (mg/Nm <sup>3</sup> )	113.00	105.40	<b>-6.73</b>

# HFO 380 #	Without Xbee	With Xbee	Difference (%)
Flow (Nm <sup>3</sup> /h)	22 536.00	22 521.00	-0.07
CO <sub>2</sub> – Carbon Dioxide (%)	6.10	4.70	-22.95
CO – Carbon Monoxide (mg/Nm <sup>3</sup> )	98.40	56.20	-42.89
NO – Nitrogen Oxide (ppmv)	1 094.00	826.00	-24.50
NO <sub>x</sub> – Nitrogen Dioxide (ppmv)	1 125.00	851.00	-24.36
O <sub>2</sub> – Oxygene (%)	12.60	14.70	+16.70
Particulates (mg/Nm <sup>3</sup> )	99.30	59.65	-39.93
SO <sub>2</sub> – Sulfur dioxide (mg/Nm <sup>3</sup> )	1 222.00	1 002.00	-18.00
VOC – Volatile Organic Compounds (mg/Nm <sup>3</sup> )	76.90	45.60	-40.70

### 5 ) Consumption:

The logic in mechanics implies that a cleaner engine which exhausts are reduced consequently consumes less fuel. Actually, the reduction of the fuel consumption is only a back to normal \_ all engines overconsuming after a few months or years of work with standard fuels.

This parameter though is difficult to measure as many factors and variables impact the fuel consumption. The only scientific and objective method to control the evolution of the fuel consumption is to install devices to measure the fuel consumption per liter (in & out) and the power generation (kW/h) at least. Then, it is possible to calculate the specific fuel oil consumption in g/kWh.

The other approach is more subjective but not less reliable in many cases as Technical Directors, Fuel Purchasers or Fleet Engineers know well the yearly consumption of their engines and can spot a difference of a few percents.

For information, based on the fuel prices in September 2011, Xbee costs about 1.16% of a ton of HFO 380 and only 0.8% of a ton of MGO.

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### Technical data

#### Product description

**Name:** Xbee, fuel organic enhancing agent.

**Composition:** Organic compounds made soluble in an organic solvent. Contains 99.5% aliphatic distillate of crude oil (kerosene) and 0.5% enzymes extracted from tree leaves.

**Physical and chemical properties:**

Aspect >	clear liquid	Boiling point >	177°C (760 mmHg)
Color >	colorless	Flash point >	81.1°C (Closed cup)
Smell >	slight smell of solvent, petrol	Density >	0.804 to 16°C

#### Method of use

**Ratio:** Recommendation is four thousand (4,000) liters of fuel to one (1) liter of Xbee: 4,000:1.

**Compatibility:** Compatible with all kind of fuels based on petroleum distillates and others including Diesels, Gasolines, Heating oils, Heavy fuel oils, Biodiesels, Bioethanols, Recycled oils, Pure vegetable oils, etc.

#### Precautions

**Transport:** Product not subject to transport regulations (ADR/RID/ADNR – IMDG/OMI - IATA/ICAO)

**Storage:** To be stored in the original containers, in a cool and well-ventilated place, away from sources of ignition. Should not be exposed to direct sunlight, UV rays potentially harmful to the enzymes. Shelf life of two years in correct storage conditions.