System for save ship’s fuel reduction harmful emissions increase diesel engine motor potential

All photos and diagrams in this presentation
received with our equipment and belong to the author
www.energy-saving-technology.com

Why am I reading this presentation?

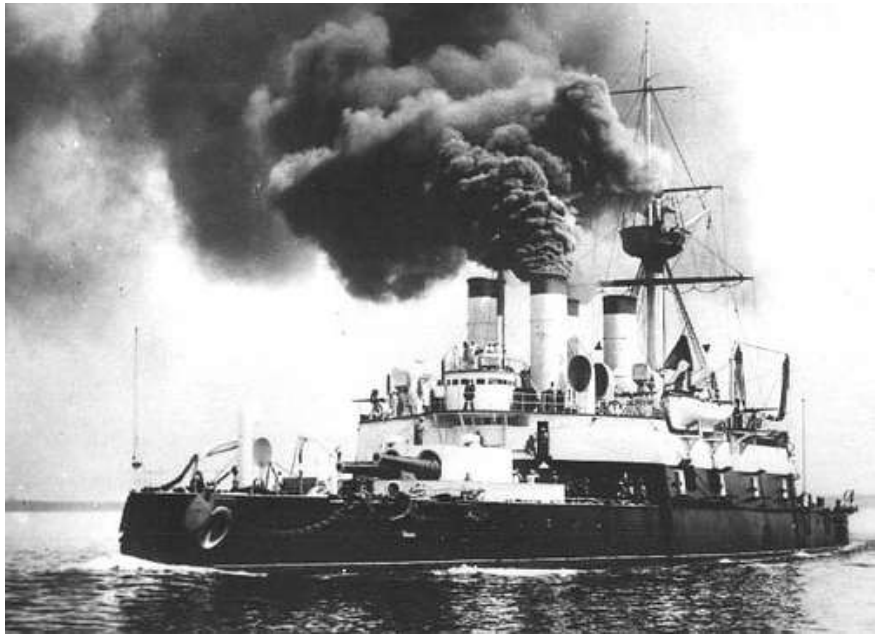
1. **I am the owner of the ship**, which burns 25 tons of fuel a daily
   and **I want to save 30 tons of fuel per month**.
2. I want to use a cheaper shipboard fuel.
3. I want to stop paying for the disposal of my sludge and safely burn it in my engines
3. I want to increase or maintain service life of my engine.
4. I want to reduce the amount of smoke from the chimneys of my ship.
5. I am not the owner of the ship, but **I am marine officer** or superintendent and I want to be useful to the ship-owner and make a career in his company.
6. I am not the owner of the ship or chief engineer, but **I want to be your partner** in the sale, installation or production of fuel-saving systems on ships.

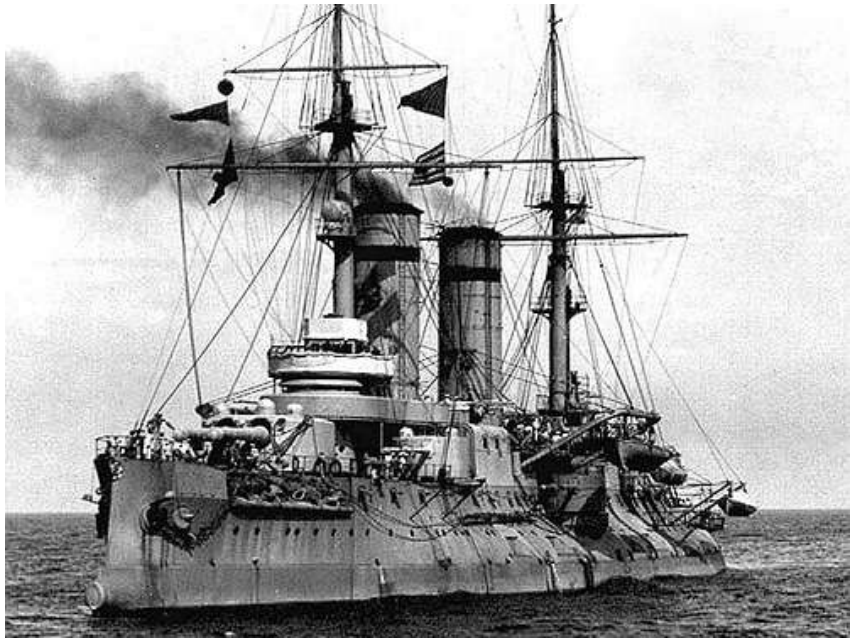
All we've been looking for a reliable, naval system of preparation and economy fuel, which really tested long-term exploitation, among countless declarations and fantastic promises of miraculous fuel economy of 10-20-30%.

We are interested in not only the purchase of equipment, but also **installed** it on my ship **package certificates, training, service, reliability and long-lasting effect.**

Clear explanation of why and how it works - below

Wind energy ... We have forgotten these clean ships
before the third world war will start ... One problem only- the wind.





Coal. Ships became faster but come smoke - an indicator of combustion efficiency and engine wear.

Since first starting the engine all problems are increasing steadily.

Liquid fuels. Ships became more faster smoke left but came sludge.

Fuel worse, engines more critical to the fuel separator discards in sludge 2-4% of fuel.

short technical proposal

We offer install on your ship - the system of pretreatment ship's fuel (save ship's fuel) - **PSSF** (**pretreatment system of ship fuel**) produced by **BIMONT d.o.o. (SLO)**, which would provide the following results:

1. An increase speed of fuel combustion in engines and boilers, which will **reduce harmful emissions and the amount of smoke up to 30%,** reduce specific fuel consumption and provide **fuel economy from 2% to 4%.**
2. Reduced **fuel viscosity from 10 to 15%,** it can use the cheaper fuels.
3. An **increase lifetime for separator and engine in 2 times**, which reduces the amount of particulate Al, Si up to 30%, and reducing the amount of coke in the treated fuel to 40%
4. **Reducing the amount of fuel that cast separator to sludge tank up to 95%.**
5. Reduction size and quantity of particles of aluminum and silicon in the sediment residual ship's fuel RME 180

The main difference PSSF :

= high reliability, long-term effective work with heavy fuel oil, high-quality processing of different fuels.

= possibility of execution scheduled operations by ship's crew without calling customer service.

= experience of successful exploitation for 5 years and the presence of some positive objective analysis and testing.

Evidentiary facts 1. **Reliability** - before we offered you PSSF system, we tested it practically to the territories of Russia, Ukraine, Belarus, Syria, in continuous operation for 2-3 years with heavy fuel oils, in conditions of poor filtration of high viscosity and content of abrasive particles, resins , asphaltenes suspension The similar German equipment breaks down after 3-4 months and can not be serviced through the board crew.

It worked on buffer tank 28.11.2011–03.08.2012, 15.08.2013-01.04.2013
It worked on settling tank 16.08.2013-01.04.2013

The overall results of the use of ship's modules TRGA testing on ro-ro ship Larkspur "from 19 to 22 08. 2012

	Operation on the standard fuel	Using module TRGA only on the buffer tank	Using module TRGA only on the settling tank	Using module TRGA on the buffer tank and on the settling tank
The main observed effects				
Flue gas temperature St. (C)	325 326 337	356 356 357	353 347 353	**368** **370** **370**
Level CO	100%	- 3.8 – 6.4 % -5.27 – 6%	-6.47 – 10.39%	**-10 – 14.97 %** **-12.34 – 13.67**
Visual amount of smoke **length in meters of water followed**	100% at startup – a lot of smoke during the driving 30-80 meters	at startup – less for 30% during the driving 5-40 meters	**at startup – less for 40%** **during the driving 5 - 10 meters**	at startup – less for 30% during the driving 5 - 20 meters
The amount of fuel sludge from the separator	0.692 tonnes per day Of which the fuek is 415 kg	0.692 tonnes per day Of which the fuel is 415 kg	0	**0**
	1	2	3	4

Additional effects of the installation of ship modules TRGA

1. Additional heating fuel. **TRGA modul provides heating fuel in a buffer tank on the temperature of 85-90 degrees**, what reduces the viscosity of the fuel, using fuel or high binding in the case of poor fuel heaters lining the resin, which is the build-up. **TRGA module provides heating fuel in settling tank so that the fuel is heated to 5 ° C in a streaming through the module.**
2. Reducing the amount and size of solid particles in the fuel directly affects the speed and reduce the amount of fuel sludge to collection tanks for fuel mud tank and, in addition to direct fuel saving, provides cost generated by the fuel acquisition sludge by the port services.
3. Reducing the amount and size of solid particles in the fuel has a direct impact on the reduction of wear separator and saving in the cost of its repair and maintenance.

The results of a review sheet 1

- Increase the exhaust gas temperature: + 40 ° C
- reduction CO: - 10-15%
- reducing the length of the plume: - 30-600%
- reducing the amount of fuel in the sludge tank: - 95-100%

documentation :

http://bimont.si/en/Fuel_Treatment_files/TRGA-3G.pdf

http://www.energy-saving-technology.com/documentation/ship/TRGA_sheep_en.pdf

4. Reducing the amount and size of solid particles in the fuel has an indirect impact on reducing pollution **settling tank** and the costs incurred in cleaning.
5. Using a modul TRGA back to the **buffer tank** provides a softer transition from a heavy fuel engine and vice versa, which, in addition to reducing the heat load allow to start the transition process in less fuel earlier, which also saves on diesel.

Reliable operation of modul TRGA

Module TRGA on the buffer tank has worked continuously from 28. 11. 2011 to 15. 8. 2012, which means for 9 months. TRGA module did not require continuous monitoring or any maintenance. TRGA module did not require any cleaning, adjustment, or replacement of any parts or regulation. TRGA module was turned off before testing in August 2012, and after the test is still working. Reviewof TRGA module during testing showed that the module is in an excellent and perfect mechanical condition and has no traces of wear.

Module TRGA in a settling tank has worked continuously from 19. 8. 2011 to 18. 10. 2012. The module did not require continuous monitoring or any maintenance. The TRGA module did not require cleaning, adjustment, replacement of any parts or regulation.

Marine Company Transeuropa Shipping Lines d.o.o.
(Transeuropa Ferries) Koper Slovenija
www.transeuropaferries.com
Direktor – ing. Rihard Stergulc

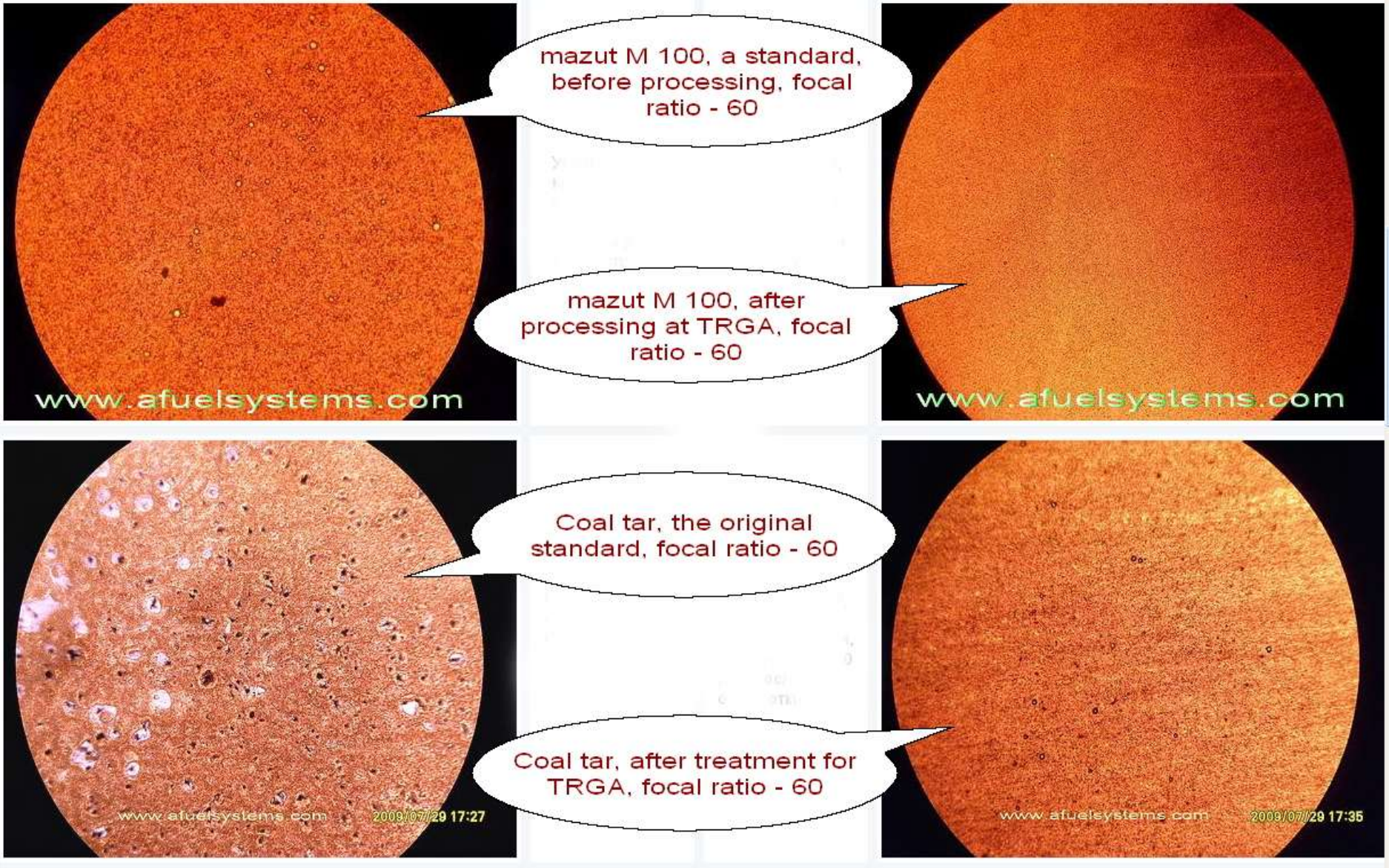
TRANSEUROPA SHIPPING LINES RIHARD STERGULC d.o.o. FLEET MANAGER signature

The result of a review sheet 2

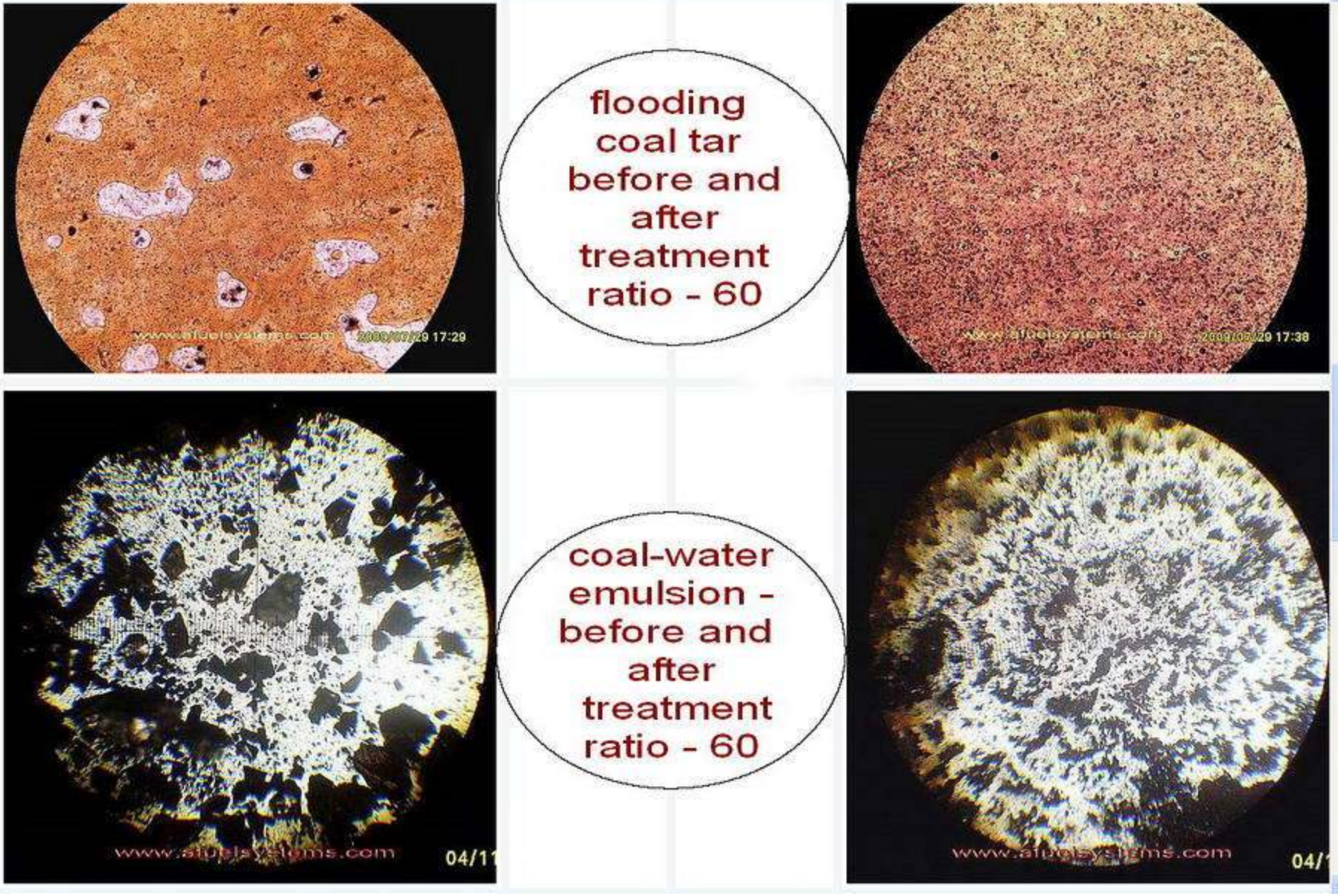
- parallel heating buffer tank to 85-90 C

- parallel heating settling tank at 5 C for one treatment cycle o

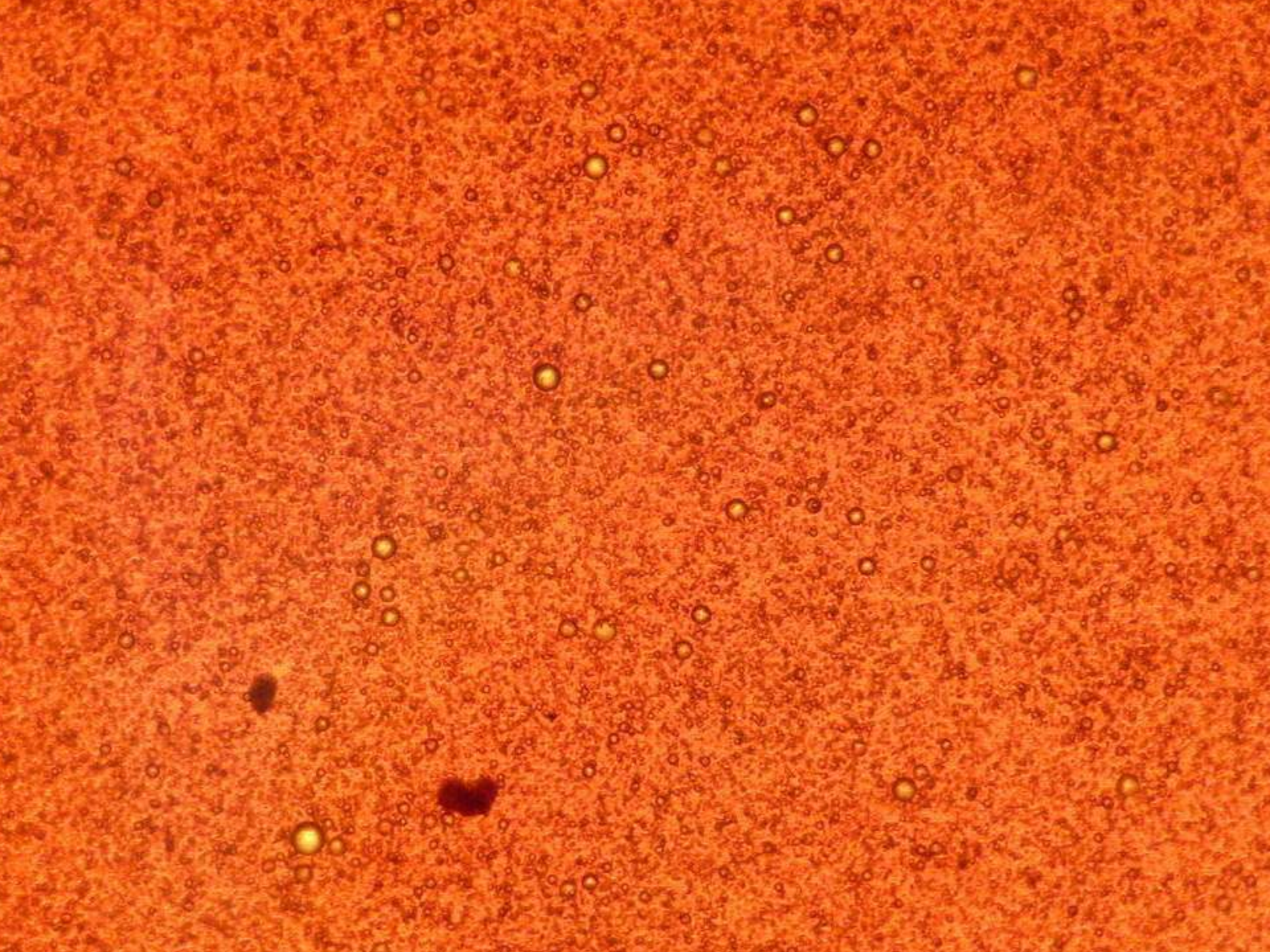
- reducing the viscosity of the fuel by 10-15%

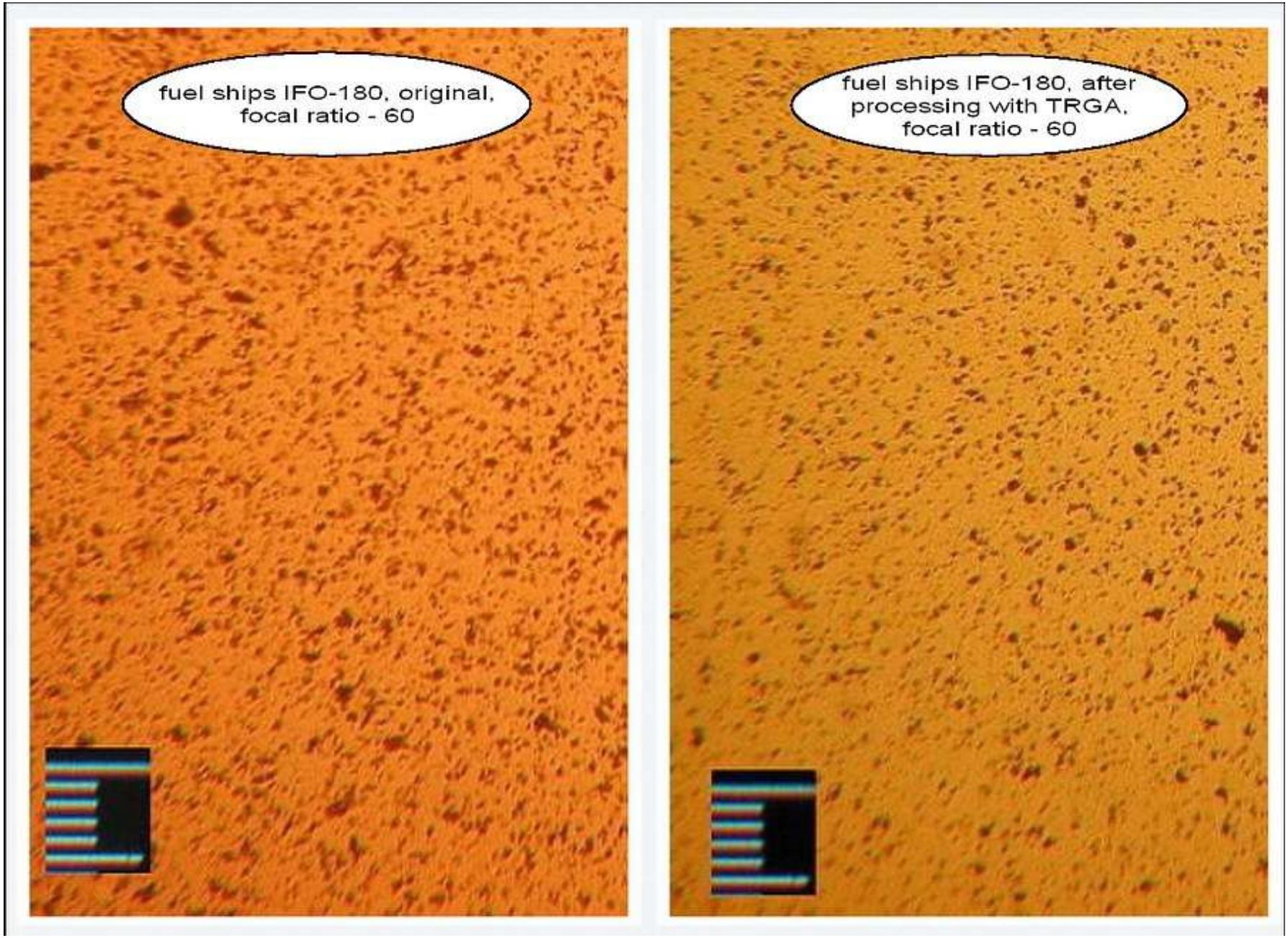


Examples of the fuel processing by system PSSF - fuel oil M100 and coal tar pitch



Examples of the fuel processing by system PSSF - coal tar and water-coal fuel





Examples of the fuel processing by system PSSF - fuel IFO-180

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Fakulteta za pomorstvo in promet

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18. 11. 2012

prof.dr.Miran Zgonik,dipl.ing.
Faculty of Maritime Studies and Transport
Pot pomorščakov 4
6320 Portorož

BIMONT Ltd
Senčna ulica 19
6310 Izola

THE OPINION on the use of hydrodynamic homologator and emulsifier of motor fuels and combustible mixture, type of TRGA-3G

The undersigned Miran Zgonik on the request of a company BIMONT Ltd from Izola. did a reviewe of a documentation of a current development work and testing practical measurements of the prototype homogenizers TRGA- 3G on the ship. to the extent total of 157 pages. Tests and measurements were performed in a cooperation with the authorized companie RACI rationalization combustion Ltd. Tehnološki park 24. Ljubljana Slovenia on a ro-ro ship Larkspur owned TransEuropa Shipping Lines Ltd. in navigation between Belgium and England. The company BIMONT has already acquired relevant quality certificates for making these devices.

I have the following opinion of the usefulness and reasonableness of the application of such homogenizers for use on a ships.

This is the first practical attempt to transfer the invention cavitation homogenizers of a inventor and constructor mag. Andrii Ruban, who has been operating successfully in many land-based boilers in Eastern Europe, on the ship. The objective of this application is to offer to a shipping market an easier, more reliable and economical device for homogenizing bad (and therefore cheaper) heavy marine fuels from the

review

marine department of the university in Ljubljana, Slovenia

The appearance of a "simple, more reliable and more cost-effective device for the treatment of " bad i.e. cheaper ship's fuel “

page 1

space is enough. in the engine the time for a combustion is only a few hundredths or tenths of seconds, hardly any space, the floors are significantly higher and a lower excess air.

2. it will be reduce the specific fuel consumption as the same. less or even more than was observed in the boiler.
3. it will the concentration of nitrogen oxides and carbon monoxide increased or decreased because of a more intensive combustion
4. how it will be with the smoke in the exhaust gases, as it shipowners particularly interested in, because in the ports under control, the smoke is noticeable and seen from far away.
5. what happens to the sulfur in the fuel,
6. about how much the size of solid particles (mainly silicon and sand) were reduced in such treated marine fuel and if they will be enough small that we could houpe for a less wear rings in the cylinder,
7. it will be sufficient a standard pup for fuel which is already in the system for a good functioning of TRGA -3G
8. for how long the effect of homogenization is visible, after the fuel is returned into the tank.
9. what kind of savings of the power can be expected in comparasion with a conventional rotary homogenizers

Measurements of the pilot project were carefully performed, they tried to catch as more similar sea conditions in the comparison between the normal and the treated fuel. With some reasoning we can answer at questions as follows:

1. The homogenizer was operated perfectly the pressure and temperature differences were expected in the required limits. When you switch to the homogenized fuel the engine and the whole system were warm faster and achieved sooner a stable state, which indicates a higher effective power.
2. They were not able to measure directly a fuel consumption, because this would require the installation of flow meters supplied and return fuel to the plant. Also effective engine power or torque on the shaft could not be measured directly and therefore, is needed a different conclusion about the specific fuel consumption: the increase in the rotational speed of the propeller in the same quantity of fuel injected (index = const.) From 490 to 510 min-1, 4 %. From the square propeller

“ Pilot project was executed meticulously with maximum regard to sea conditions when compared with the work on the standard and the treated fuel.

With homogenizer the engine quickly came to an efficient operating mode.

Increase in the rate shaft rotation was +1.4%"

Page 3

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3. Measurement of exhaust emissions have shown that contrary to expectation, despite the intense combustion and more power oxides of nitrogen do not increase but even slightly reduced. Similarly is with the monoxide.
4. Measurements of smoke directly in these experiments, on the ship has not been measured, but the comparative photographs were includede in the report, which are showing us the significantly less black smoke in the homogenised fuel. Similarly, as was also found in boiler rooms (they were included in the report a comparison of smoke after Bosch similar procedure).
5. The sulfur in the fuel can not disappear, because it is a basic element. Can be only binded differently. In the emissions with TRGA- 3G treated fuels are measured at slightly lower levels, but this can only be attributed to measurement methods, which detect less of them. It may be somewhat easier to sulfur

"Gains increasing the rotational speed of the shaft was 1.4%, this means an increase in energy by 8% or decrease of specific consumption by 8%

Change smoke opacity contradicts the expectation of increasing combustion intensity

- smoke has declined, as have decreased the CO and NOx level.

proved a sure decline of smoke "

Page 4

compounds bind (hidden) in the small solid particles such as in a big one. (Total area of smaller particles may be greater than if the same or even greater weight to large particles). For the shipowner this is better. Because of some higher power of course the specific values (g / kwh), would be smaller ones.

6. Attached microscopic image comparison between the original and with TRGA-3G homogenised fuel shows that a cavitation reduced to a few fragments, approximately below 4 microns, which is two to three times less than what pass through a mechanical homogenizers and at least 10-20 times less than the particles were in untreated fuel. Small pieces of tier 4 microns to wear rings do have no effect.
7. For a good operation of TRGA -3G is sufficient a previously built supply pump if the pressure in the system is 6 or more bars, if not you need to install an additional pump.
8. In the fuel which is returned back into a buffer tankaf after the homogenization the effect remained for several hours.
9. Savings of drive power pumps with TRGA- 3G compared to a traditional homogeniser in the shown experiment were not measured. At the University of Tallinn were measured two to three times the difference in favor of TRGA -3G. The most important was a low power consumption.

Conclusion:

The use of homogenizers type TRGA- 3G, which has been operating successfully in the boiler house on the land identified by the current pilot project looks promising also for the ship and it does not appear to be any hidden problems.

Miran Zgonik

"Accompanying comparative photographs under the microscope between the original and processed fuel show a decrease in the particle size 10-20 times ...

the effect of treatment lasts a few hours ...

TRGA-3G device requires less energy and uses standard pumps ... and operation of this system is not expected any hidden problems"

page 5

Reducing the amount of particulate matter, tars and the other impurities in the fuel leads to:

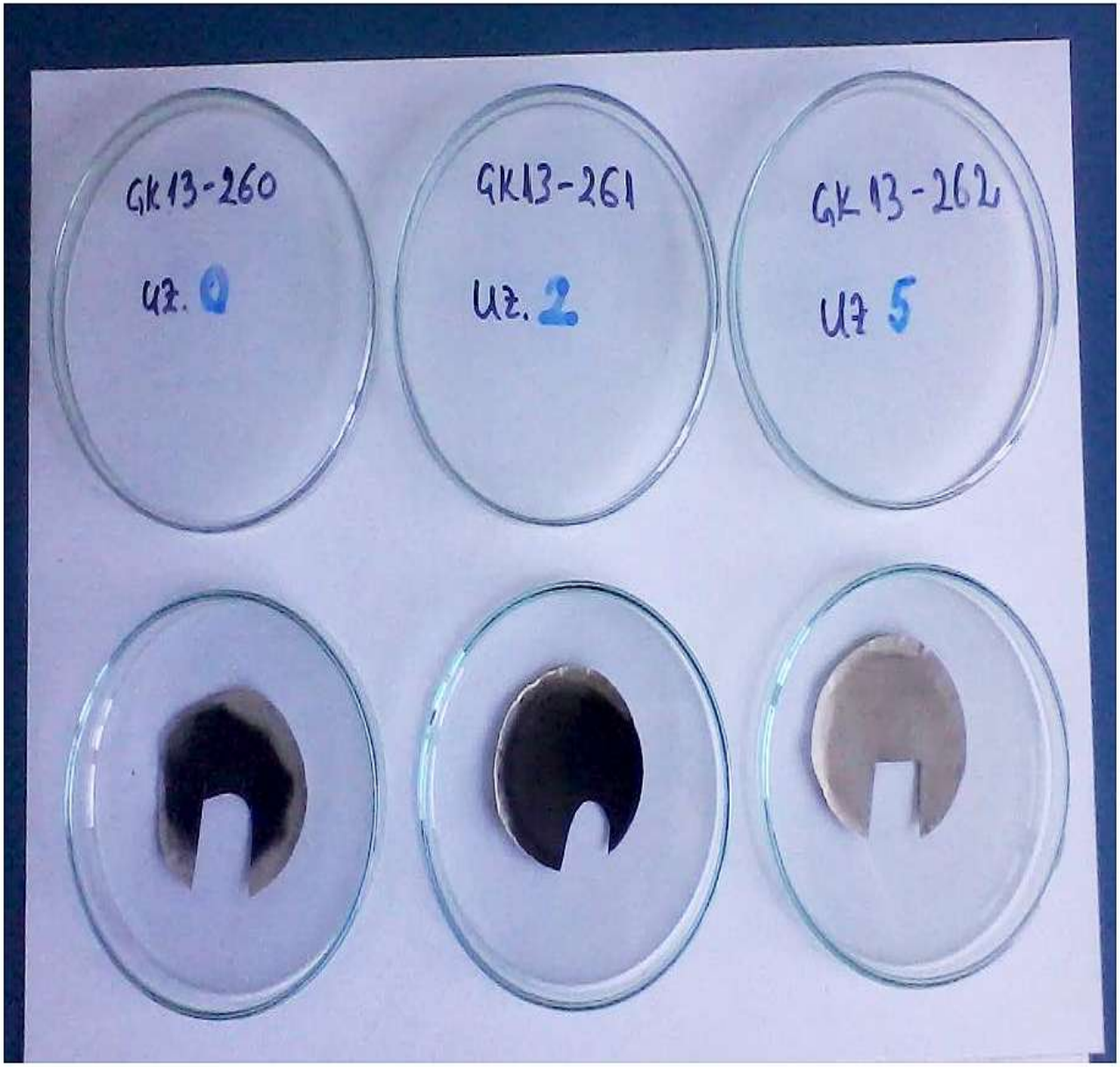
1. more efficient fuel combustion and reduce fuel consumption
2. reduces the amount of unburned residues and the deposits in the engine and heat exchanger that increases the average efficiency power plant in the period between repairs or cleaning.
3. Reduces the amount of smoke and emissions

The company "Saacke" with Chinese universities in Jamey experimentally proven

- " increase the efficiency of the boiler due to crushing fuel = 303 kJ / kg "

www.afuelsystems.com/ru/trga/s12.html

The residue fuel on filter



results of research IFO180, processed by PSSF system, 2013

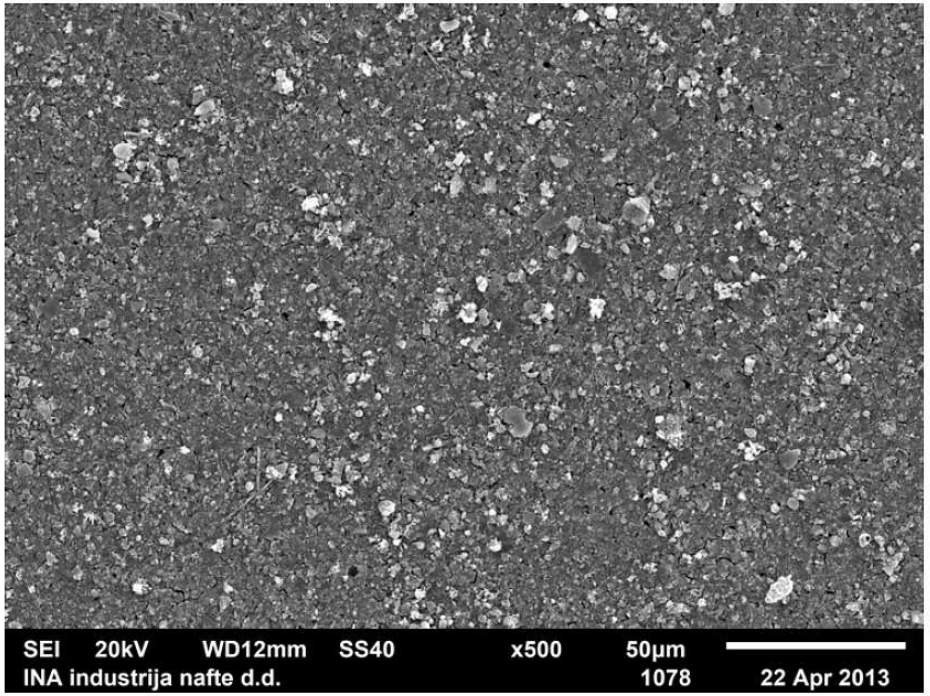
Laboratory group INA, Zagreb, Croatia.

Sample left – the original fuel

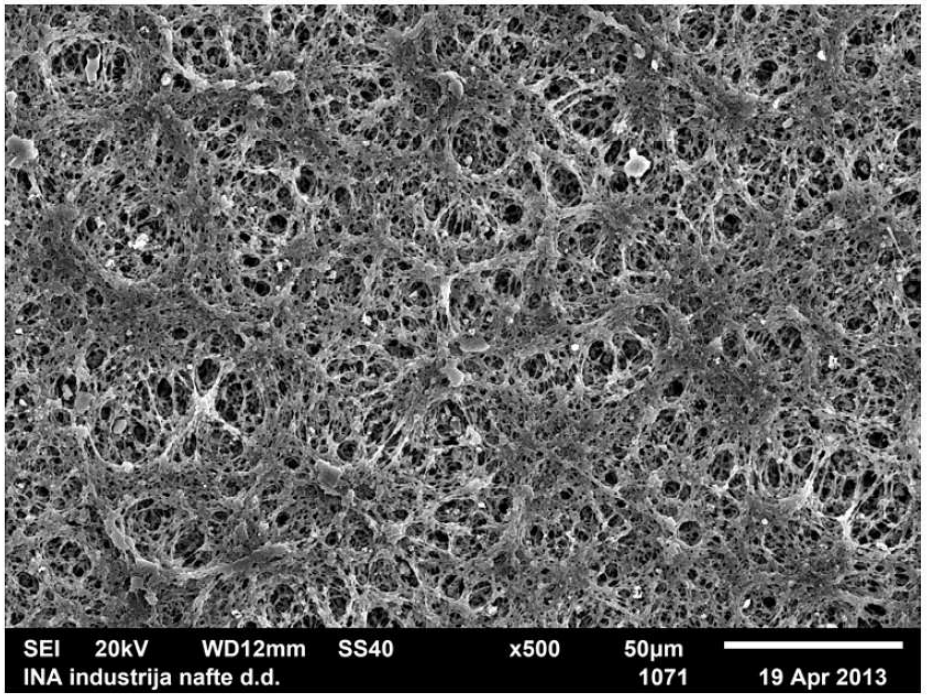
Sample middle - processed fuel

Sample right- fuel after 3 times treatment

The residue fuel on filter



Slika 3. SEM mikrofotografija uzorka "0" , povećanje 500x

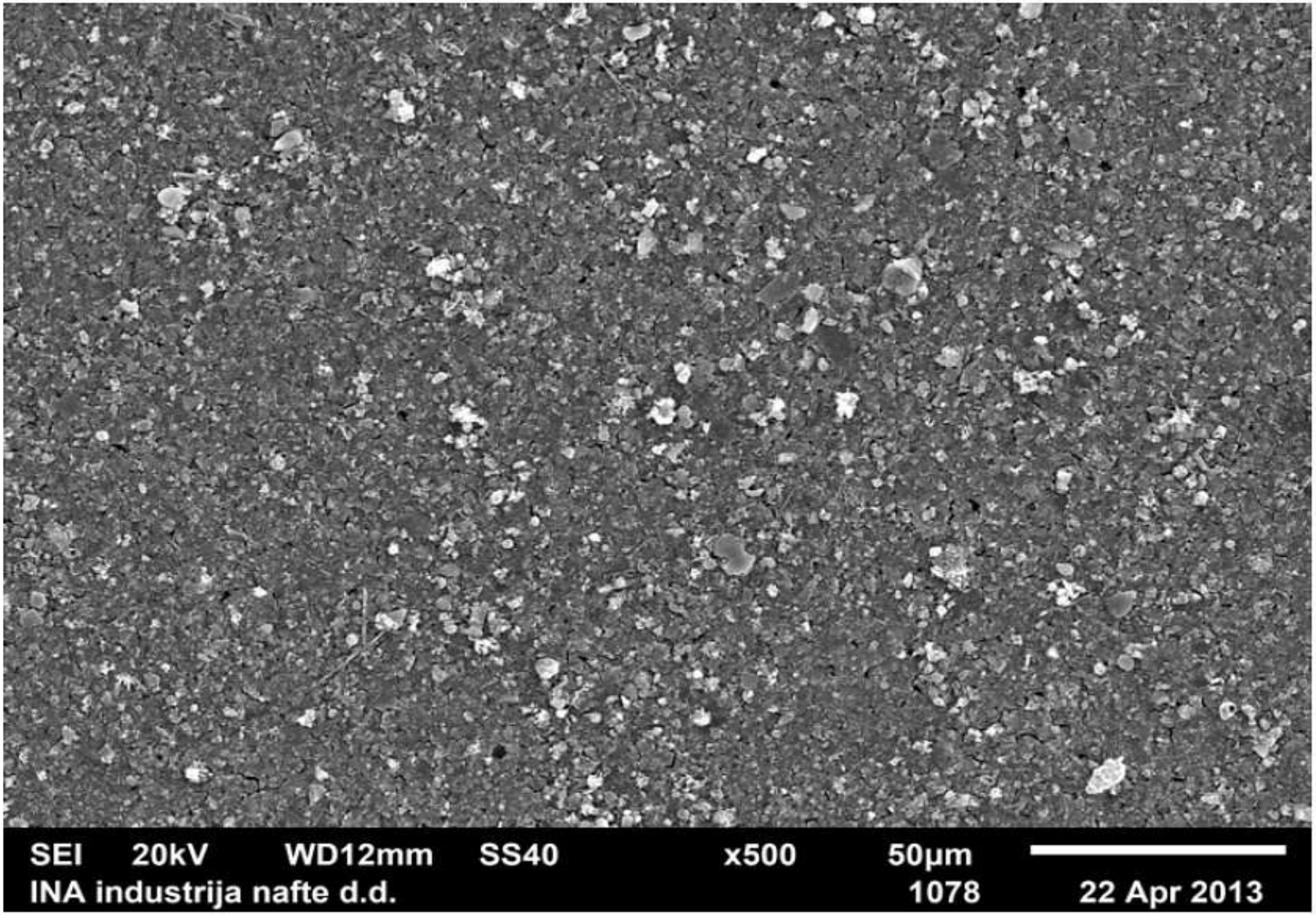


Slika 5. SEM mikrofotografija uzorka "5" , povećanje 500x

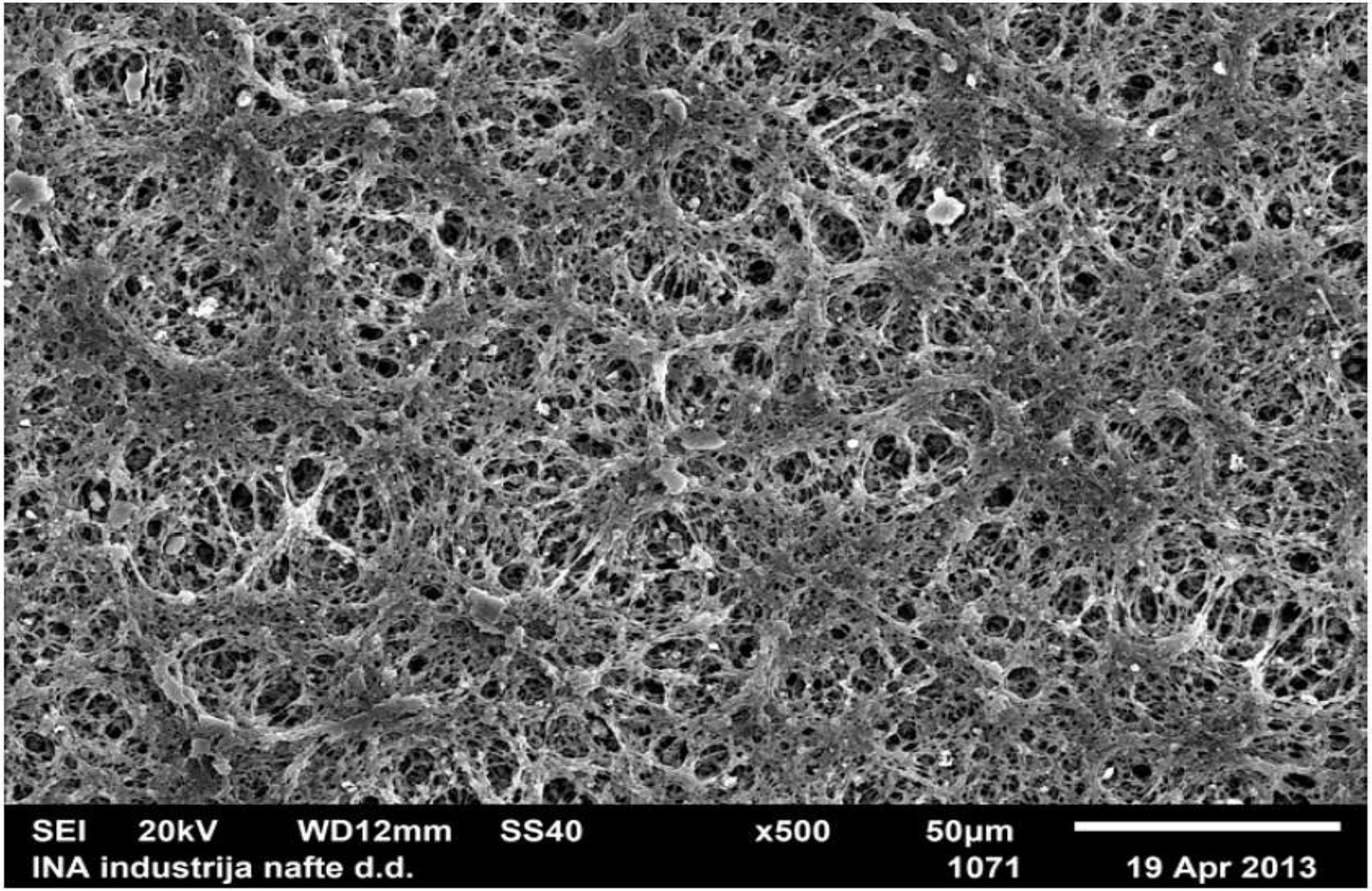
1. The sample on the left-the - original fuel laboratory filter is completely clogged fuel residues.

2. Sample right-to-fuel processing after 3 times Laboratory filter is clean - in the photo - visible filter structure and only a few bits ...

All photos were taken with an electron microscope in central laboratory INA group, Zagreb, Croatia. Increase of 500 times.



Slika 3. **SEM mikrofotografija uzorka “0” , povećanje 500x**



Slika 5. SEM mikrofotografija uzorka “5” , povećanje 500x

Separation of sediments from HFO – hot filtration of fuel with chloroform on a nitrocellulose filter 0,45µm

Ref. Number of Sample	Ref. No. Of Laboratory	Sample of HFO (ml)	Mass of HFO sample (g)	Mass of filter paper (g)	Mass of fil.paper + particles on paper (g)	Mass of particles on Filter paper (g)	Mass of particles (mg on kg of HFO)
0	GK12-260	150	244,92	0,1072	0,1096	0,0024	9,8 mg/kg
2	GK12-261	150	244,93	0,0981	0,1000	0,0019	7,7 mg/kg
5	GK12-262	150	245,63	0,1042	0,1057	0,0015	6,1 mg/kg

INA
INDUSTRIJA NAFTE, d.d.
SD Istraživanje i proizvodnje nafte i plina
Sektor za upravljanje i inženjering polja
Služba laboratorijskih ispitivanja IPNP

FUEL ANALYSIS WITH SEM METHODOLOGY (Electronic Scanner Microscope) OF SHIP'S HFO RESIDUALS – F RME 180

Ref.no.: 50000360-033/13
Report: 00 | Page: 5/25
Date: 26 April 2013.

After the filtration process 3 dry residual on the filter paper were obtained (Photo 2), those are analyzed with electronic microscope. Samples were steam processed with gold, and then analyzed using scanning electronic microscope JEOL JSM-6510 LV. Several micro photography were taken.
The EDX analysis is maiden (identification of peaks of the energy spectrum of X-radiation) for individual particles using Oxford INCA X-act.

Sample 0 - weight of particles on the filter is 9.8 mg / kg

Sample 5 - weight of particles on the filter is 6.1 mg / kg

Reduced by "- 38%"

The official conclusion of the laboratory INA group, Zagreb, Croatia

www.energy-saving-technology.com/documentation/ship/INA_HFO_eng.pdf

Sample received: 11.04.2013

Lab. ID number: 1130001148

Fuel sample F-RME180

Date: 7.5.2013

Analysis ordered by: BIMONT d.o.o.
Senčna ulica 19, 6310 Izola, Slovenia
For: Mr. Trošt, Mr. Štok

www.energy-saving-technology.com

Property	Unit	Test method	Date	Measur. uncertainty	0	1	2	3
Density at 15 °C	kg/m3	EN ISO 12185:98	17.4.13	1,2	942,2	939,7	939,7	939,7
Density at 50 °C	kg/m3	EN ISO 12185:98	17.4.13	1,2	919,2	916,6	916,6	916,7
Viscosity at 50°C	mm/s2	EN ISO 3104:98	19.4.13	5,2%	144,7	133,9	139,6	122,8
Carbon residue	%(m/m)	EN ISO 10370:98	17.4.13	0,59	7,29	7,52	6,80	7,16
Ash content	%(m/m)	EN ISO 6245:03	23.4.13	0,003	0,029	0,026	0,027	0,036
Water content (by distillation)	%(m/m)	ISO 3733:99	18.4.13	0,1	0,60	<0,05	<0,05	<0,05
Pour point	°C	ISO 3016:96	16.4.13	3	15	9	6	9
Heat of combustion - net	MJ/kg	ASTM D 4868:10	7.5.13	0,07	40,70	41,10	41,40	41,09
Water and sediments (centrifuge)	%(V/V)	ISO 3734:97	19.4.13	0,10	0,50	0,50	0,10	0,10
Vanadium content	mg/kg	PML.I.14597:97	7.5.13	9	87	86	86	86
Nickel content	mg/kg	PML.I.14597:97	7.5.13	6	30	29	29	29
					stand	no add	no add	+1 add
	Not accredited							
Flash point, PM - info	°C	EN ISO 2719			128,5	118,5	116,5	160,5
Elements, WD-XRF								
Sulphur	%(m/m)	PML.0716.+18.			1,553	1,528	1,521	1,540
Aluminium	mg/kg	PML.0716.+18.			5	<1	2	3
Silicium	mg/kg	PML.0716.+18.			10	4	6	7
Iron	mg/kg	PML.0716.+18.			23	22	24	24
	mg/kg							

Analysis Supervisor
Andreja Gregorc, dipl.ing.

Head of Laboratory
Manja Moder, M.Sc.Chem.

PETROL, d.d., Ljubljana LABORATORY PETROL
Zaloška 259, 1260 Ljubljana, SLOVENIJA, tel.: +386 1 586 35 00, fax.: +386 1 586 35 02

Legend :

Samples of treated fuel RME 180 , 7-15 days after treatment, the result -
- reduced viscosity at "-10%"

Other indicators are interesting, namely :

1. Lowering pour point from 15 to 6 and 9 C.

2. Increase in calorific value from 40.7 up to 41.4 MJ / kg

3. Reducing flash point to 116.5 from 128.5 degrees.

4. Reduction in the amount of of trapped particles of aluminum and silicon in 2 times .

Laboratory Ljubljana, Slovenia, 2013.

филиала ОАО «РЖД»
Адрес: 680032, г. Хабаровск, проспект 60 лет Октября.

Протокол № 2913
Результатов анализа мазута до установ

№ п\п	Наименование показателя	Норма по ТУ Марка мазута Ф5	Ф 12	40	100	Фактически	Ис
1.	Вязкость кинематическая при 50 °С, сСт , не более	36,2	89,0	-	-		ГОС
	Вязкость кинематическая при 80 °С, мм²\с, не более	-	-	59,0	118,0		
	Вязкость кинематическая при 100 ОС, мм²\с, не более	-	-	-	50,0	14,45	
2.	Зольность, %, не более - малозольный	-	-	0,04	0,05	0,08	ГО
	- зольный	0,05	0,10	0,12	0,14		
3.	Массовая доля механических примесей ,% , не более	0,10	0,12	0,5	1,0	0,595	ГОС
4.	Массовая доля воды, %, не более	0,3	0,3	1,0	1,0	2,8	ГОС
5.	Содержание водорастворимых кислот и щелочей	Отсутствие				отс	ГОС
6.	Массовая доля серы ,% , не более	2,0	0,6	3,5	3,5	1,98	ГО
7.	Температура вспышки, определяемая в открытом тигле, °С, не ниже	-	-	90	110	153	ГОС
8.	Температура вспышки в закрытом тигле, °С, не ниже	80	90	-	-		ГОС
9.	Температура застывания, ОС, не выше	- 5	-8	10	25		ГОС
10.	Плотность при 20°С , г\см³, не более	0,955	0,966	Не нормируется, определение обязательно		0,925	ГО
11.	Теплота сгорания, Дж\кг, не менее	41454	41454	39900	39900	39090	ГОС

Заключение: мазут марки 100 ГОСТ10585-99 не соответствует

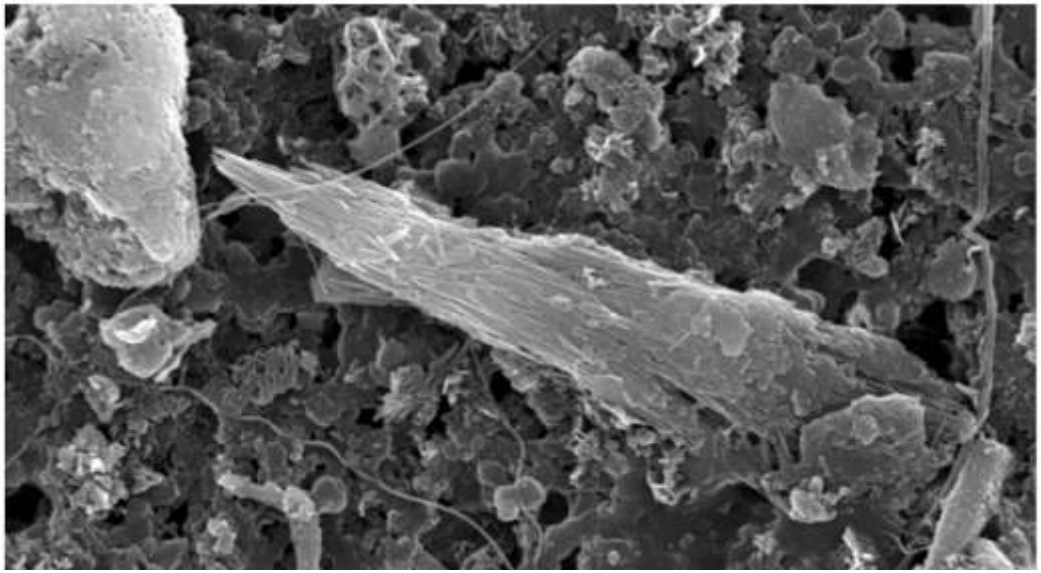
филиала ОАО «РЖД»
Адрес: 680032, г. Хабаровск, проспект 60 лет Октября.

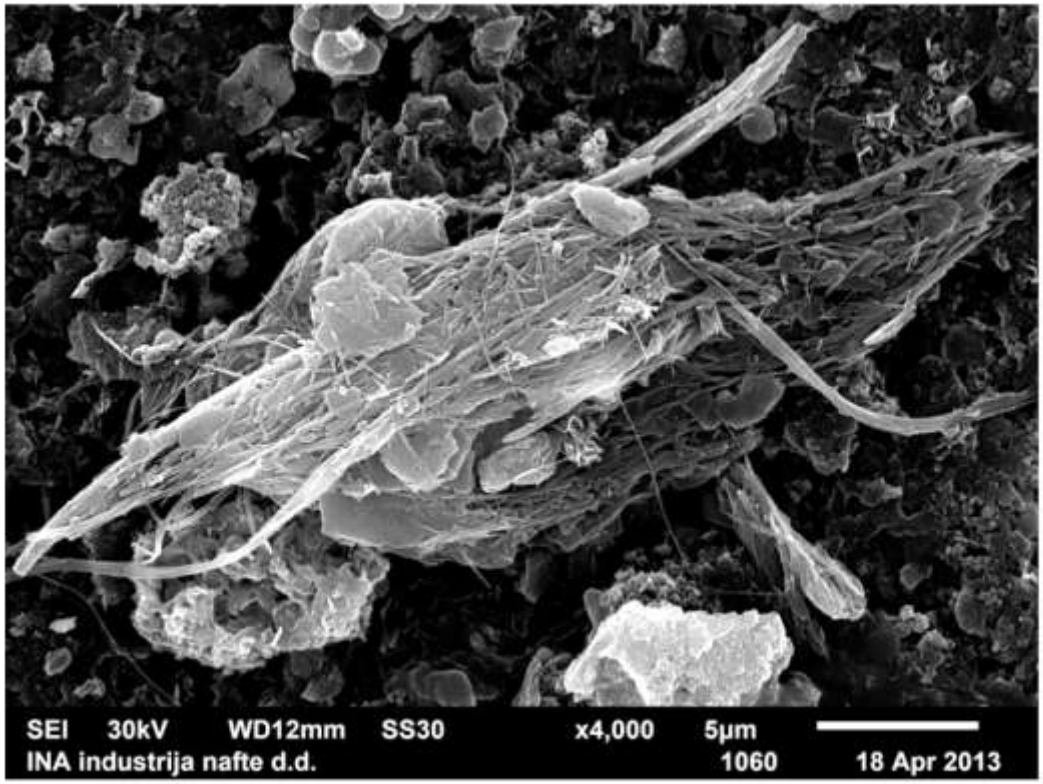
Протокол № 2914
Результатов анализа мазута после установки

№ п\п	Наименование показателя	Норма по ТУ Марка мазута Ф5	Ф 12	40	100	Фактически	Метод Испытания
1.	Вязкость кинематическая при 50 °С, сСт , не более	36,2	89,0	-	-		ГОСТ 33
	Вязкость кинематическая при 80 °С, мм²\с, не более	-	-	59,0	118,0		
	Вязкость кинематическая при 100 ОС, мм²\с, не более	-	-	-	50,0	15,20	
2.	Зольность, %, не более - малозольный	-	-	0,04	0,05		ГОСТ 1461
	- зольный	0,05	0,10	0,12	0,14	0,081	
3.	Массовая доля механических примесей ,% , не более	0,10	0,12	0,5	1,0	0,574	ГОСТ 6370
4.	Массовая доля воды, %, не более	0,3	0,3	1,0	1,0	6,9	ГОСТ 2477
5.	Содержание водорастворимых кислот и щелочей	Отсутствие				отс	ГОСТ 6307
6.	Массовая доля серы ,% , не более	2,0	0,6	3,5	3,5	1,96	ГОСТ 1437
7.	Температура вспышки, определяемая в открытом тигле, °С, не ниже	-	-	90	110	155	ГОСТ4333
8.	Температура вспышки в закрытом тигле, °С, не ниже	80	90	-	-		ГОСТ 6356
9.	Температура застывания, ОС, не выше	- 5	-8	10	25		ГОСТ 20287
10.	Плотность при 20°С , г\см³, не более	0,955	0,966	Не нормируется, определение обязательно		0,926	ГОСТ 3900
11.	Теплота сгорания, Дж\кг, не менее	41454	41454	39900	39900	39050	ГОСТ 21261

Заключение: мазут марки 100 ГОСТ10585-99 не соответствует по 4,11

The effect of increased caloric content indicate tests from Russian Railways 2013. Original fuel has 2.8% water content, processed fuel oil - 6.9%, but the calorie content is almost equal. Recalculation shows an increase caloric content by 4.29%. ...





0x

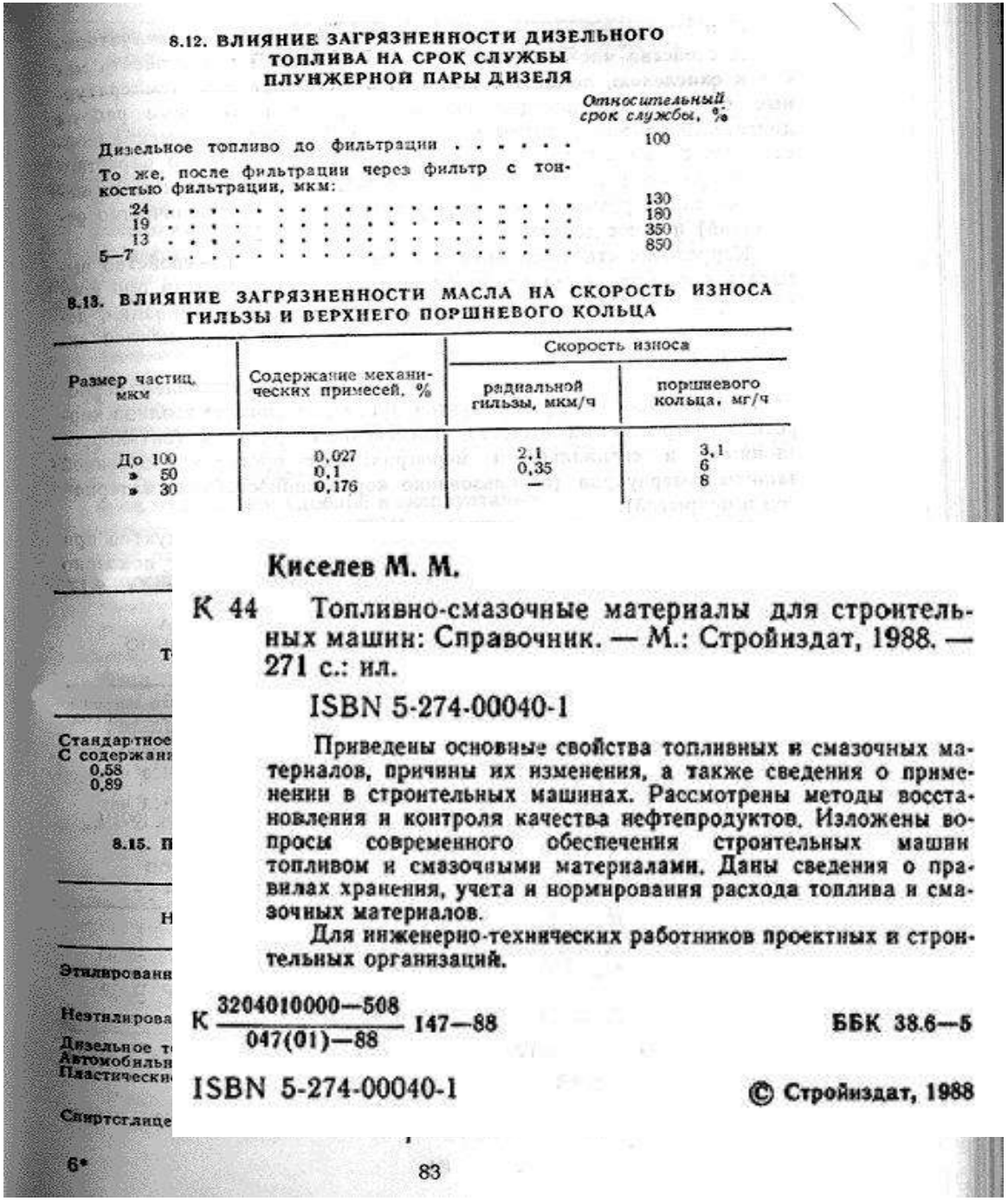
SEM mikrofotografija "vlaknaste" čestice iz uzorka "2", povećanje 4.000x

PSSF system crushes even fibrous particles in the ship's fuel ...

Photos - Laboratory INA, Zagreb, Croatia. Increase 5000 and 4000 times. Electron microscope.

All details and contacts of laboratory can be provided.

Before and after…



8.12. ВЛИЯНИЕ ЗАГРЯЗНЕННОСТИ ДИЗЕЛЬНОГО ТОПЛИВА НА СРОК СЛУЖБЫ ПЛУНЖЕРНОЙ ПАРЫ ДИЗЕЛЯ

	Относительный срок службы, %
Дизельное топливо до фильтрации	100
То же, после фильтрации через фильтр с тонкостью фильтрации, мкм:	
24	130
19	160
13	350
5—7	850

8.13. ВЛИЯНИЕ ЗАГРЯЗНЕННОСТИ МАСЛА НА СКОРОСТЬ ИЗНОСА ГИЛЬЗЫ И ВЕРХНЕГО ПОРШНЕВОГО КОЛЬЦА

Размер частиц, мкм	Содержание механических примесей, %	Скорость износа	
		радиальной гильзы, мкм/ч	поршневого кольца, мг/ч
До 100	0,027	2,1	3,1
» 50	0,1	0,35	6
» 30	0,176	—	8

Киселев М. М.

К 44 Топливно-смазочные материалы для строительных машин: Справочник. — М.: Стройиздат, 1988. — 271 с.: ил.

ISBN 5-274-00040-1

Приведены основные свойства топливных и смазочных материалов, причины их изменения, а также сведения о применении в строительных машинах. Рассмотрены методы восстановления и контроля качества нефтепродуктов. Изложены вопросы современного обеспечения строительных машин топливом и смазочными материалами. Даны сведения о правилах хранения, учета и нормирования расхода топлива и смазочных материалов.

Для инженерно-технических работников проектных и строительных организаций.

К $\frac{3204010000-508}{047(01)-88}$ 147—88 ББК 38.6—5

ISBN 5-274-00040-1 © Стройиздат, 1988

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Fuels and Lubricants Handbook, the publication of the USSR

"The influence of contamination of diesel fuel on the life of the plunger pair (fuel pump) of diesel engine"

Lifetime diesel engine in the automotive diesel fuel:

1. unfiltered = 100%
2. in filtering (or grinding particles) up to 5-7 microns. = 850%

Fineness particle by system PSSF = 4-5 microns.

improved combustion and fuel economy 4.1% on the boiler

Суточные объемы производства перегретого пара и потребления мазута на котле №5

Date / дата	Показатели после установки гомогенизатора TRGA-2-15G CHAUD-5 / котел №5 mazout / мазут (m3)	mazout / мазут (t)	vapeur/ пар (t)	cons.spécifique / удельный расход мазута (кг/t)
01.09.2010				72,578
02.09.2010	84	81,1	1006	80,577
03.09.2010	207	199,8	2866	69,698
04.09.2010	211	203,6	2904	70,115
05.09.2010	214	206,5	2939	70,265
06.09.2010	221	213,3	2954	72,195
07.09.2010	221	213,3	3025	70,501
08.09.2010	220	212,3	3016	70,391
09.09.2010	219	211,3	3003	70,375
10.09.2010	219	211,3	3017	70,048
11.09.2010	217	209,4	2997	69,872
12.09.2010	220	212,3	3014	70,438
13.09.2010	221	213,3	3030	70,384
14.09.2010	221	213,3	3026	70,478
15.09.2010	219	211,3	2998	70,492
16.09.2010	209	201,7	2784	72,444
17.09.2010	145	139,9	1957	71,500
18.09.2010	Аварийная остановка котла из за порыва экранной трубы заднего экрана топки			
19.09.2010				
20.09.2010				
21.09.2010				
22.09.2010	172	166,0	2270	73,119
23.09.2010	201	194,0	2778	69,822
24.09.2010	202	194,9	2798	69,668
25.09.2010	200	193,0	2764	69,826
26.09.2010	199	192,0	2733	70,265
27.09.2010	200	193,0	2714	71,113
28.09.2010	201	194,0	2749	70,558
29.09.2010	203	195,9	2684	72,986
30.09.2010	200	193,0	2703	71,402
Mois /месяц	4242,0	4093,5	57879,0	70,726

29.08.2010				73,205
30.08.2010				73,354
31.08.2010				
Mois /месяц	4957,0	4783,5	64888,0	73,719

Среднее снижение удельного расхода мазута на тонну произведенного пара на котле	2,994	кг/t
	4,1	%

Фактические показания параметров измерялись штатными приборами входящими в нижний уровень АСУТП котла:
- расход перегретого пара (ANUBAR)
- расход мазута (KROHNE UFM 3030K/2MHz)

Расчет посуточных величин производился верхним уровнем системы АСУТП котла **" Honeywell".**

Burning black oil after processing

Burning black oil standard

Photos –

Visual changes in smoke opacity before and after switch PSSF on the ship (Ostend - Ramsgate August 2012)

Photos - work system PSSF on the ship in 2012 (Ostend - Ramsgate)
engines are running at full speed - no smoke.

Photos - work system PSSF on the ship in 2012 (Ostend - Ramsgate)

engines are running at full speed - no smoke.
compare the date and time with the previous photo

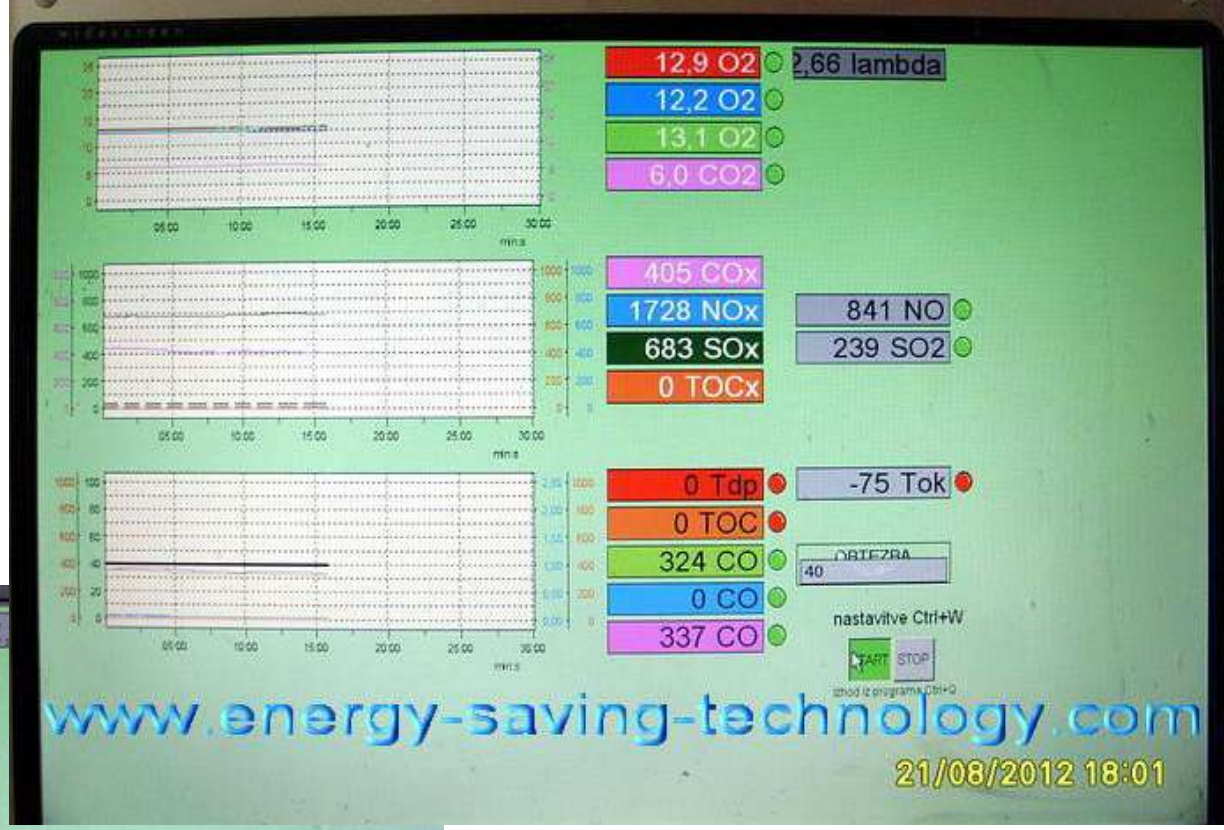
two of the same ship, the same company, on the same fuel on a collision course.
"Our" ship below

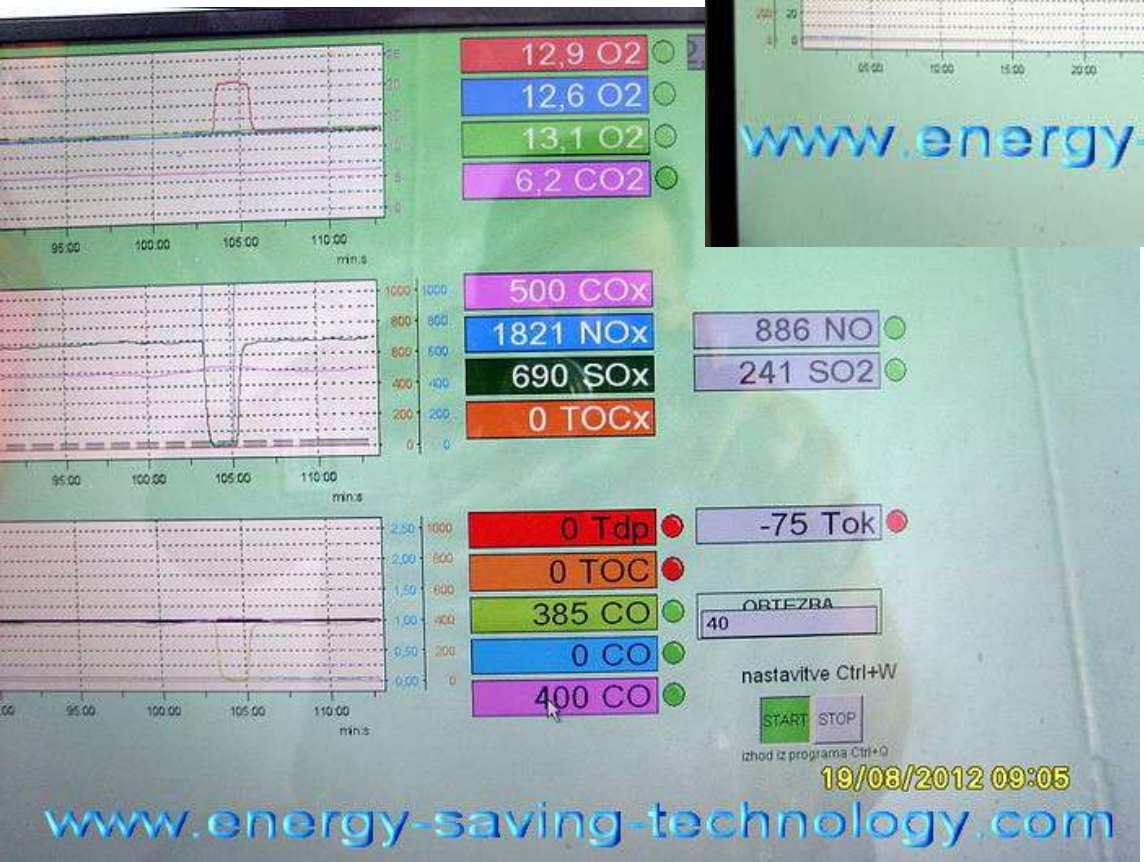
Photos - work system PSSF on the ship in 2012 (Ostend - Ramsgate)

difference in smoke ...

Left - treated fuel

Below - the original fuel





Photos - work system PSSF on the ship in 2012 (Ostend - Ramsgate)

difference readings on different fuels

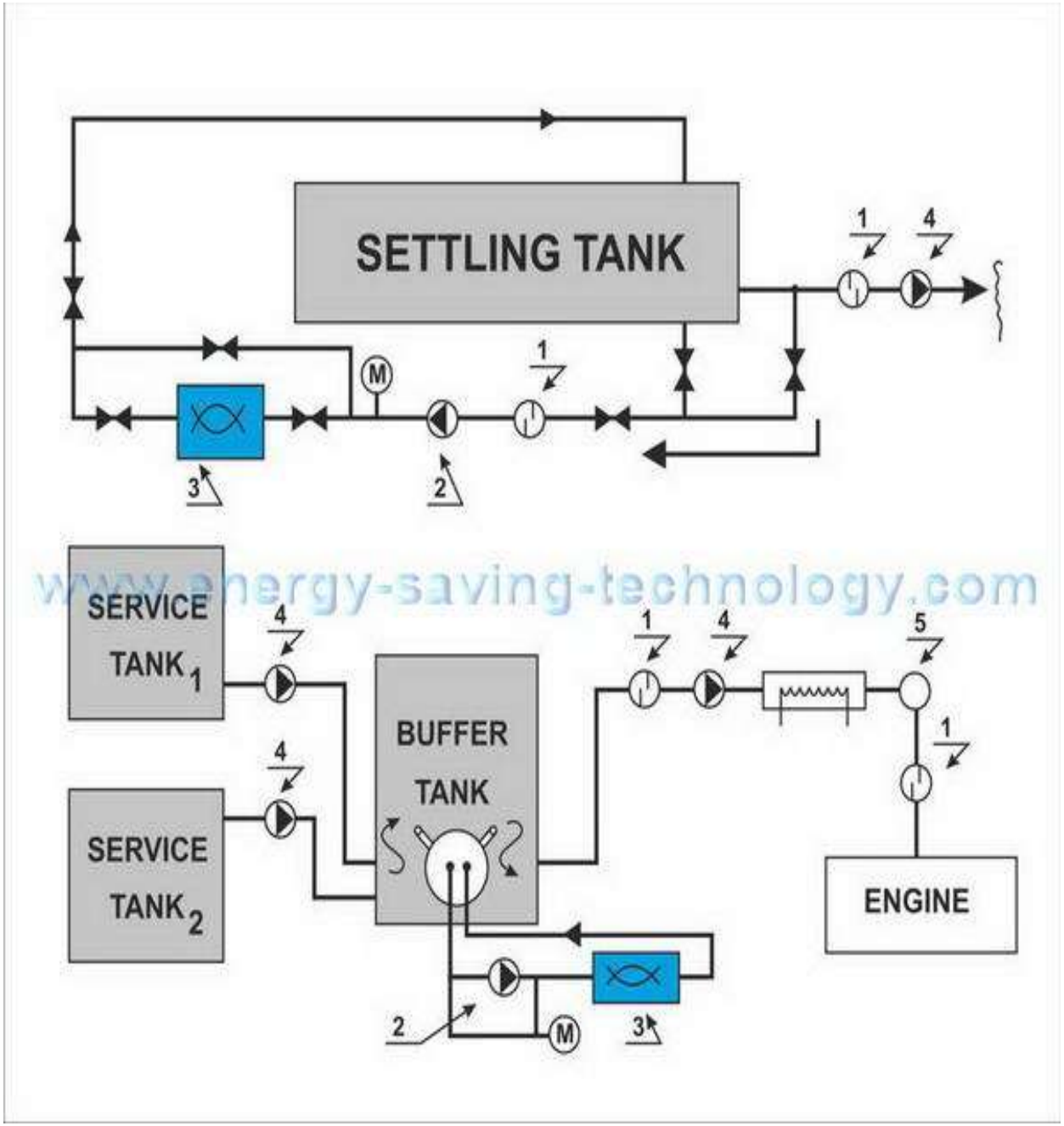
PSSF system is mounted on a ship and can be serviced by marine crew without calling a manufacturer of equipment.

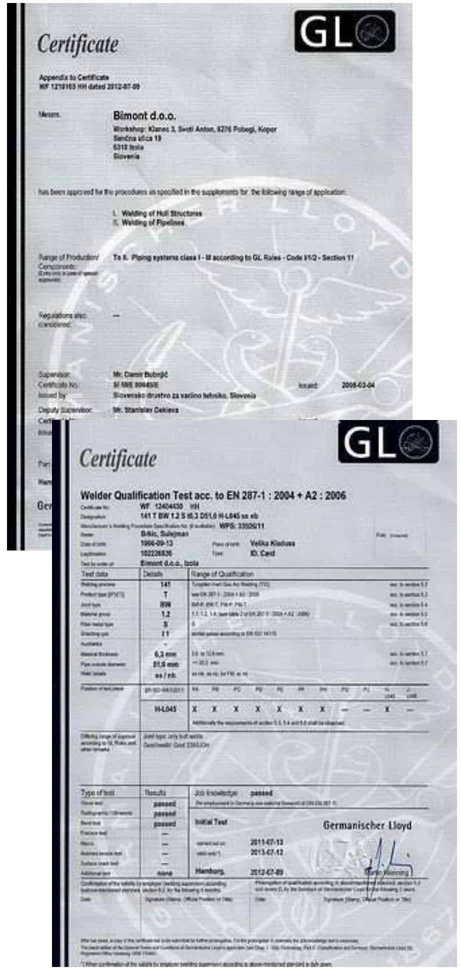
Photos - installation of PSSF on the ship in 2012 (Ostend - Ramsgate).

Measuring devices during testing.

PSSF system is mounted on a ship in a few variants using standard certified pumps.

we have all the necessary certificates for installations on ships.





Lloyd our certificates
for any installation work on ships

a bit of the economy

on-board system to improve fuel properties PSSF (pretreatment system of ship fuel) on the tests carried showed out :

1. **reduce harmful emissions and the amount of smoke up to 30%,** reduce specific fuel consumption and provide **fuel economy from 2% to 4%.** Direct minimum fuel economy on the ship's diesel engines was 415 liters per day (daily rate from 20 to 22 c. m. of fuel.

2. decrease the viscosity of the fuel up to 15%, without the use of additives, which reduces the cost of purchased fuel.
3. **Reducing the amount of fuel that cast separator to sludge tank up to 95%.** And consequently, reducing the cost of his monthly utilization.

and the organization

We have the necessary permits for the construction and installation of PSSF on all ships from London's Lloyd, just preparing documents on the transfer our equipment in the category of mandatory equipment for installed on all ships

The main difference PSSF : high reliability, long-term effective work with heavy fuel oil, high-quality processing of different fuels, possibility maintenance and repair by ship's crew, experience of successful exploitation for 5 years in extreme conditions

The main differences from the existing analogue

System to improve fuel properties **PSSF** - provide the same **degree of fuel dispersion**, like most oil-fired rotary homogenizer – **5-4 microns**.

Low weight 110-140 kg, unlike the rotor (200-350 kg).
Substantial savings in transportation and installation costs.

Low power consumption, allows to work from a standard pump without overload. The minimum energy consumption when the optional pump - **0.5-1 kW h per 1 ton.**

Can be installed in the supply line to the nozzle black oil boiler.

It does not contain seals and rotating elements (except the pump) and safe.
The pressure range 2-40 atm. Temperature range 40-250 degrees.
High crushing effect.

Ability to work aggressive fuels - Coke, jet fuel, various fuel blends may be used for blending biodiesel components comprising methanol and alkali.

award for the best realized project in Ukraine in the field of energy saving in 2009

diploma for the participation in the exhibition Energy Efficiency 2010, Ukraine

certificate Maritime Register of Ukraine on the use TRGA on marine engines and boiler installations, 2011

certificate Maritime Register of Ukraine on the use TRGA on marine engines and boiler installations, 2011

diploma for the participation in the exhibition of the latest energy saving technologies in the national Chamber of Ukraine 2011

ward for third place at the exhibition of the latest energy saving technologies in the national Chamber of Ukraine 2011

quality certificate for EU homogenisation TRGA (quality of production and operation) in 2011

Number in the register of goods and products in the European Union on the device TRGA

diploma for the participation in the exhibition Energy Efficiency, 2011, Ukraine

certificate of compliance ща Russian Federation on module for creating fuel compositions and nonchemical treatment of hydrocarbons 2012

Lloyd's Certificate for the right execution of repair and installation work on the ships of any class, Slovenia, 2012

RTN Certificate of the Russian Federation on a series of devices TRGA the right to use TRGA in high risk industrial objects of Russia, Kazakhstan, Belarus. 2012

Awards and Certificates

resume

1. PSSF system tested long-term operation at more than 100 sites in over 6 years in the most extreme conditions on the light and heavy fuels and fuel blends
2. PSSF system was laboratory tested by certified laboratories in Slovenia and Croatia.
3. PSSF system successfully passed a test of reliability during the 12-month operation of the ship.
4. PSSF system has a positive opinion from marine department of the university in Ljubljana, Slovenia
5. PSSF system has CE certified and ends its additional certification in English Lloyd.
7. PSSF system is made in Slovenia by BIMONT d.o.o. which has all the necessary certificates to install this system on any ships.

8. The official conclusion of the restructuring of fuel.
9. The official report on the full tests on the ship.
10. You want to be our partner ?
11. You want to be our customer ?

www.energy-saving-technology.com