

# TRGA - devices for full burning standard and heavy black oil

liquid oil sludge  
recovery and production substitutes of boiler fuel.  
[www.energy-saving-technology.com](http://www.energy-saving-technology.com)

# History

In April 2012, started treatment sludge from open storage with homogenizer TRGA 3G-40 (40 cub. m.)

Purpose - treatment sludge and bringing the finished product as a heavy fuel black oil.

After 19 months using our customers have sent several films.

Looks not "european", but works 19 months. and makes a profit.



All photos taken and short films of the same scale, without any adjustments, except texts. Movie links are below. Here we show comparative photographs.



# Visual result



# Visual result

original product - oil sludge  
before treatment.



oil sludge after treatment with  
TRGA homogenizer.



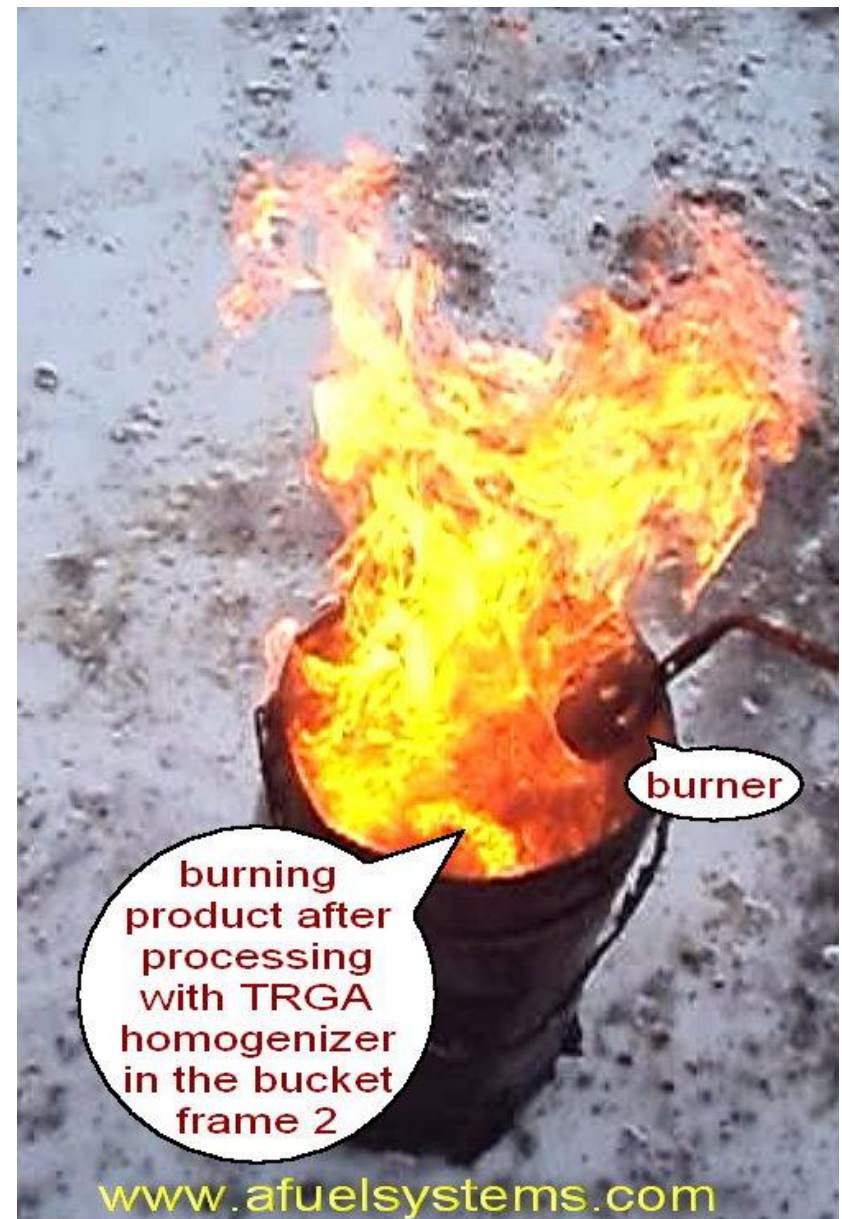


# Visual result

difference in viscosity, pour point, the amount and size of particles of mechanical impurities obvious. But we will show how to burn both of these products using a gas burner - in the bucket - the original product and processed product

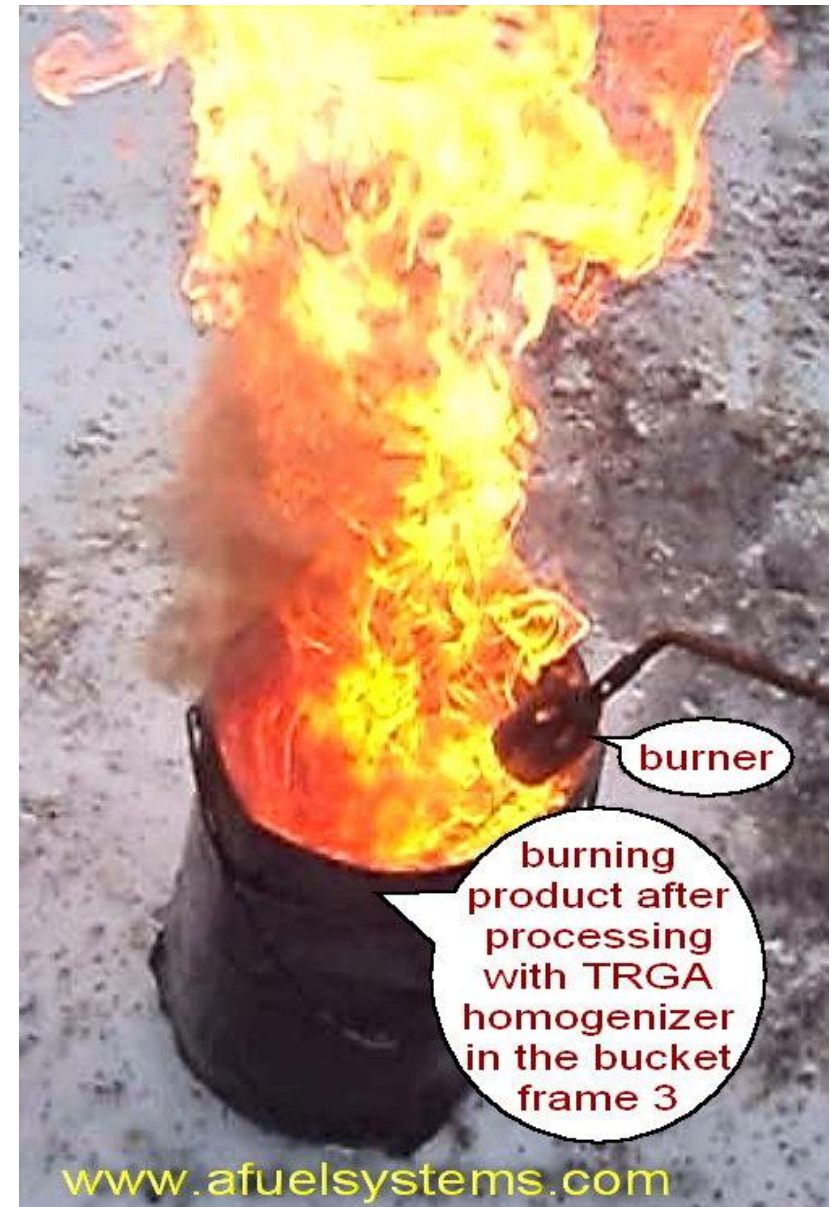


# Visual result





# Visual result



# Visual result





**Remarque :**

We understand that simple homogenization , even through the best homogenizer TRGA, is not enough. The production process of liquid fuel oil sludge has several stages and processing methods , in which the homogenizer - only a tool , useful , but not comprehensive.

But we can guarantee that in processed product – we not added light petroleum fractions, additives for improve combustion and/or liquefiers.

**Continued :**

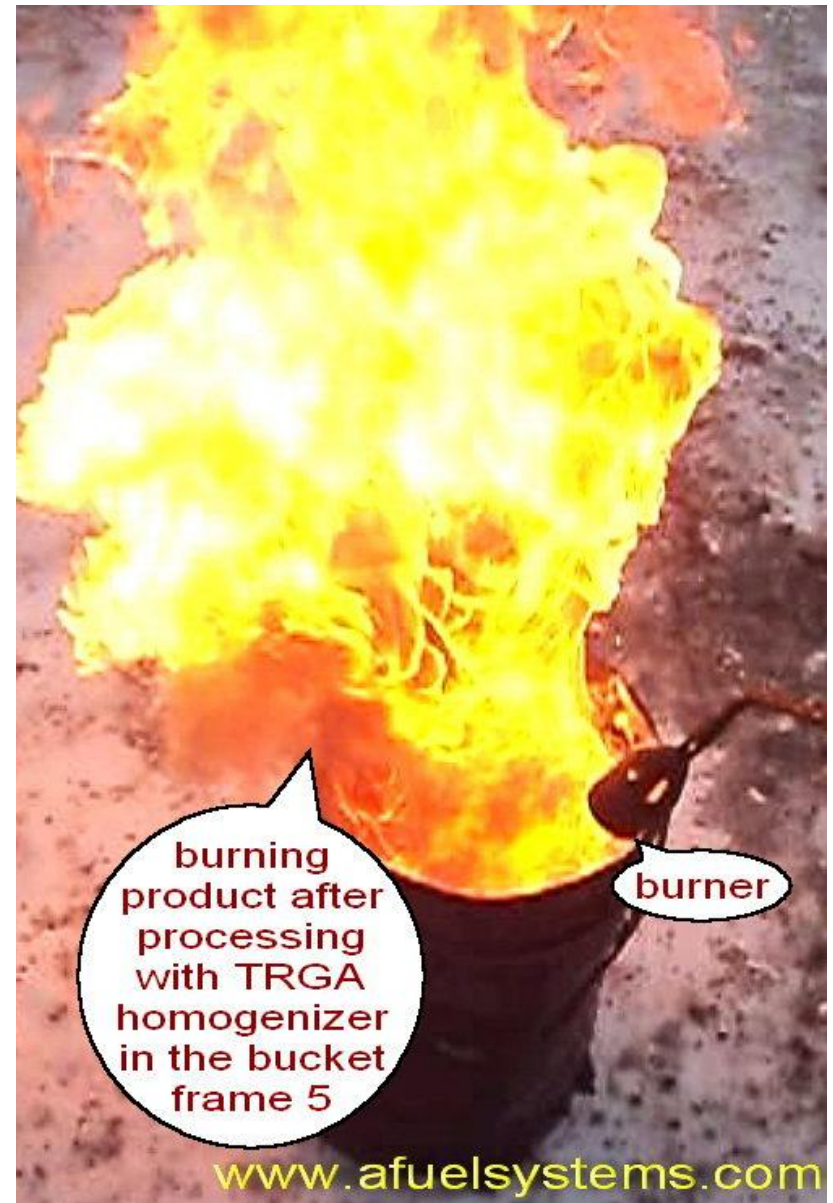
Combustion in a closed buckets volume occurs at a higher temperature conditions. and try to toughen burn both of these products on a flat and open the steel sheet, i.e. at a lower temperature ...

## burning in a bucket

1. original product –  
oil sludge of open storage – [film](#)
2. processed product –  
oil sludge after homogenization  
with a homogenizer TRGA – [film](#)

## below burning on a flat steel sheet

1. original product - oil sludge of  
open storage
2. processed product - oil sludge  
after homogenization with a  
homogenizer TRGA









# Visual result



[www.afuelsystems.com](http://www.afuelsystems.com)



# Visual result



sludge after treatment  
with IRGA homogenizer  
- after 8 seconds sludge  
starts to burn in the  
flame of the burner

[www.afuelsystems.com](http://www.afuelsystems.com)

# Visual result



original sludge  
burning in the flame  
of the burner after  
30 seconds,  
burns only the torch  
of the burner

[www.afuelsystems.com](http://www.afuelsystems.com)



sludge after treatment  
with TRGA homogenizer  
- after 30 seconds sludge  
burning in the flame of  
the burner

[www.afuelsystems.com](http://www.afuelsystems.com)



# Visual result





# Visual result



# Visual result





# Visual result



sludge after  
treatment with  
TRGA homogenizer  
- maximum flame in  
self-burning, burning  
of light fractions

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# Visual result





## Conclusion:

Burning oil sludge on the open steel sheet, i.e. at lower temperatures, showing the presence positive changes in the chemical-physical composition of the fuel and the need for homogenizers in the production fuel mixtures from oil sludge.

In the processing of sludge was used homogenizer TRGA-3G-40 (after 19 months of its use in the North of Russia) resupply pump CRIBROL (made in Russian), for high viscosity fuel



## Movies:

1. Original sludge - in the combustion flame, on the steel sheet – [film](#).
2. The same sludge after treatment - in the combustion flame, on the steel sheet – [film](#).

## Remarque:

We guarantee that the processed product - which does not Enter Additional or light petroleum fractions, additives improve combustion and / or liquefiers.





# Visual result

This result is fully confirmed by films about the burning of heavy fuel oil in the boiler in Syria before and after treatment homogenizer TRGA

comparative films - on the left and below



[www.afuelsystems.com/ru/trga/s106\\_1.html](http://www.afuelsystems.com/ru/trga/s106_1.html)

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](http://www.energy-saving-technology.com)

Property	Unit	Test method	Date	Measur. uncertainty	0	1	2	3
Density at 15 °C	kg/m <sup>3</sup>	EN ISO 12185:98	17.4.13	1,2	942,2	939,7	939,7	939,7
Density at 50 °C	kg/m <sup>3</sup>	EN ISO 12185:98	17.4.13	1,2	919,2	916,6	916,6	916,7
Viscosity at 50°C	mm/s <sup>2</sup>	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 :

This result fully confirms the analysis of ship's fuel made in [Slovenia](#) before and after treatment with homogenizer TRGA, laboratory research in [Russia](#), results of industrial tests in [Guinea](#), [Croatia](#), [Serbia](#), [Belgium](#)

...

and the comparative amount of soot and unburned residues on the heat exchanger tubes "with" and "without" using our product.



**Work 2 identical boilers FOSTER WHEELER type within 2 months.**

**One with TRGA homogenizer, other without one.**

**Fuel comes from a single tank. Fuel – black oil suspension with carbon powder**

**«In January, the specific consumption of fuel in the boiler without TRGA was 67.586 kg / t and the end of March already 74.139 kg / t. "» Why? look at the photo below.**











[www.afuelsystems.com](http://www.afuelsystems.com)



# CERTIFIKAT

**Notranja proizvodna preverjanja z nadzorom končne presoje  
skladna s členom 3.2 in Prilogo I (Modul A1) po Direktivi 97/23/ES**  
*Internal manufacturing checks with monitoring of the final assessment in accordance to article 3.2 and  
Annex I, ( Module A1 ) according to Directive 97/23/EC*

**Št. certifikata : IZV-PED-A1-06-810-11-01**  
*Certificate No.:*

Institut za varilstvo d.o.o. kot priglašen organ potrjuje ustreznost postopkov izvedenih s strani proizvajalca tlačnega sklopa, v obsegu določil priloge III, modul A1 in člena 3.2 direktive o tlačni opremi 97/23/ES. Proizvajalcu je odobreno označevanje tlačne opreme z našo identifikacijsko številko 2042, v okviru področja veljavnosti.  
*Institut za varilstvo, d.o.o. as a notified body confirms herewith the adequacy of the procedures carried out by the manufacturer of pressure equipment within the provisions of Annex III, Module A1 and article 3.2 Pressure Equipment Directive 97/23/EC. The manufacturer is authorized to provide his pressure equipment manufactured within the scope of the examination with our identification number 2042*

**Proizvajalec : BIMONT d.o.o., Senčna ulica 19, SI-6310 Izola,**  
*Manufacturer:*

**Naslov proizvodnega obrata : BIMONT d.o.o., Senčna ulica 19, SI-6310 Izola,**  
*Production site :*

**Področje veljavnosti : Tlačni cevovod TRGA-3G**  
*Scope of examination No. : tip: -03, -04, -05, -08, -10, -15, -20, -50*

**Št. načrta : TRGA-3G - 03,04,05; TRGA-3G - 08,10; TRGA-3G - 15**  
*Drawing No. : TRGA-3G - 20; TRGA-3G - 50*

**Poročilo št.: P1277-A1-06-810-1101**  
*Test report No.:*

Odobritev velja pod pogojem, da se izvajajo nadzorne presoje, preskusi in verifikacije s strani Instituta za varilstvo d.o.o., glede na zahteve določene v medsebojni pogodbi.  
*The approval is valid provided that surveillance audits, tests and verifications are performed by Institut za varilstvo d.o.o. in accordance with the requirements stated in the mutual contract.*

**Andrej Smonkar IWI-C**  
*Priglašen organ za tlačno opremo št. 2042*  
*Notified Body, No.2042*



**Ljubljana, 20.06.2011**  
*Place, date.:*



**Institut za varilstvo d.o.o.,** Priljska ulica 19, SI-1000 Ljubljana,  
*tel.:+386 1 280 94 00, fax:+386 1 280 94 22, www.i-var.si*  
*Obj. št. / Form No. DP-500/06*

**INSTITUT ZA VARILSTVO**  
*Welding Institute*

notified body

**ФЕДЕРАЛЬНАЯ СЛУЖБА  
ПО ЭКОЛОГИЧЕСКОМУ, ТЕХНОЛОГИЧЕСКОМУ И АТОМНОМУ НАДЗОРУ**

## РАЗРЕШЕНИЕ

№ PPC 00-048493

На применение

Оборудование (техническое устройство, материал):  
Гидродинамические гомогенизаторы и эмульгаторы топлив  
и топливных смесей TRGA по ТУ 5220-01-66554786-2011.

Код ОКП (ТН ВЭД): 52 2000

Изготовитель (поставщик): Общество с ограниченной ответственностью  
"Эффективные топливно-энергетические технологии" (г. Екатеринбург,  
ул. Кузнечная, 91-73).

Основание выдачи разрешения: Техническая документация, заключение  
экспертизы промышленной безопасности ООО "ДИАПРОМЭКС"  
№ 54-ТУ-05838-2011.

Условия применения:

1. Обеспечение соответствия поставляемого оборудования  
требованиям промышленной безопасности Российской Федерации.
2. Применение поставляемого оборудования на опасных  
производственных объектах, связанных с обращением  
взрывопожароопасных и химически опасных веществ,  
в соответствии с условиями, ограничениями и требованиями  
технической документации.

Срок действия разрешения до 31.07.2017

Дата выдачи 31.07.2012



Статс-секретарь -  
заместитель руководителя  
А.В. Ферапонтов

AB 073918