NanoModificators

Supercavitational supersonic nanomodifiers for oil products– diesel fuels – NanoEcoFuel – NM-01, NM-02, NM-03.

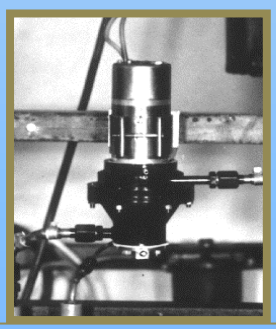
Diesel Fuel economy up to 22% - 24%

Improved ecological Characteristics 50% - 70%

Installed on diesel engines for the destruction of "heavy" molecules of hydrocarbons and the "light" water molecules with the formation of free radicals and structures with new properties - modified fuels NanoEcoFuel.

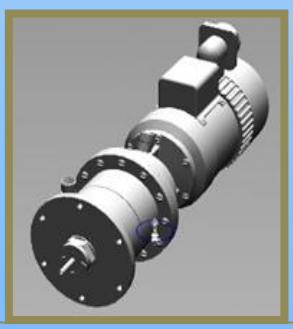
Effects are used:

- hydrodynamic developed cavitation - supercavitation;
- shock waves in supersonic flows bubble - supersonic wave;
- formation of direct and inverse water-fuel nanoemulsions;
- overlay of super-high-frequency (SHF), resonant vibrations on a hydrocarbon mixture with water.



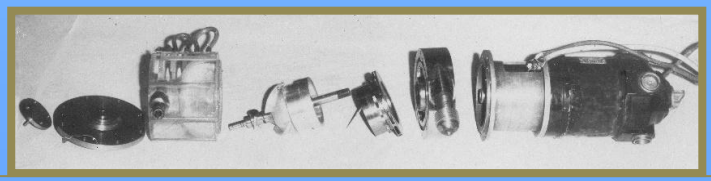
NM-01

For automotive diesel engines of Ford Duratec RS, capacity up to 200 kW
sp. fuel consumption 175 - 180 g/kWh.



NM-03

For diesel engines of tractors and diesel locomotives type V-84MS, B-92C capacity up to 2000 kW
sp. fuel consumption 170-175 g/kWh.



NM-02

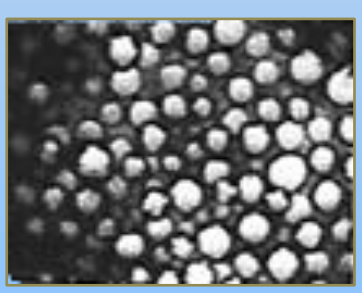
For marine diesel engines RTA96-C, type MU DD 16V4000, C280-6 capacity up to 6000 kW, sp. fuel consumption 165 - 170 g/kWh.

NanoEcoFuel

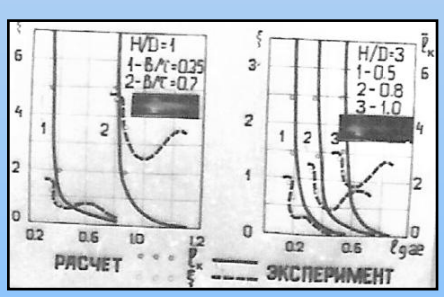
Between 1975 and 2015, ours and other scientists and experts held a huge set of studies on the effect of hydrodynamic cavitation in the physical and chemical characteristics of hydrocarbons and made dozens of inventions that allow use hydrodynamic cavitation devices for fuel economy (10%-12%) in engines internal combustion engine and increase the yield of light fractions (15%-18%) of oil.

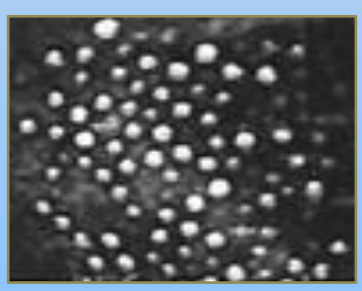
And only in the last 3-4 years we have been obtained unique results for the modification of hydrocarbon fuels in a mixture of water (10%-8%), due to the integrated use of hydrodynamic cavitation and shock waves in the bubble media at the resonant modes of the electromagnetic wave exposure to microwave frequencies. This has made it possible to obtain a new type of diesel fuel NanoEcoFuel, which saves up to 22 ... 24% of the fuel in diesel engines and significantly improve their environmental performance.

NanoEcoFuel is a mixture of hydrocarbons with a small amount of water, the result of resonant-impulse destruction of "heavy" (C6 ... C100) hydrocarbon molecules into 2, 4 or more parts and the water molecules to dimensions of 0.1 to 20 nm, followed by self-organizing structure in the presence of special additives emulsifiers and by obtaining a modified non-stratified fuel.



Water - Oil sludge 66/33 æ=2,8 5 μм





Water - Oil sludge 55/45 æ=1,4 5 μм

Technological process of NanoEcoFuel production:

- **obtaining finely dispersed emulsions** – mixing fuel with small amounts of water (5% - 8%) followed by treatment with "hard" mode of cavitation with special additives;
- **obtaining nanostructured liquid hydrocarbon** – by generating in finely dispersed emulsion of two-phase (steam-gas and liquid) flow bubble with supersonic speed, by formation of shock waves that destroy the molecular structures with the formation of highly active radicals;
- **obtaining multi-component fuels NanoEcoFuel** – multiple recycling on the resonant mode of super-high frequency electromagnetic impact (12 - 48 GHz) nanostructured liquid carbohydrates.

Our Offers

1. Supply super-cavitational devices for preparation of modified fuels directly in diesel engines with capacity from 60 to 6000 kW.
Price from 1 to 12 thousand dollars, depending on the performance of the diesel engine and destination.

NanoEcoFuel

2. Supply of stationary modular technological lines for the production of modified diesel fuel, preparation of water-oil finely dispersed emulsions for TPP, for processing oils before cracking processes at oil refineries with capacity of 10 to 70 t/h.
Prices from 60 to 240 thousand dollars depending on the performance of production lines and destination.

3. For wider adoption of super-cavitational machines and production lines of various capacities for the preparation of modified fuels NanoEcoFuel is possible invest in the establishment of industries for serial production NanoEsoFuel of various capacities.
The minimum investment amount $ 3 million if own funds of the partners 10% or the presence of a bank guarantees for the implementation of the business project.
Investment funds from 3 to $ 30 million depending on the business project and not more than five years.

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Our Results

Ecological indicators - reduction of emissions of diesel engines with NanoEcoFuel							
Capacity, kW	50	200	600	1200	2000	4000	6000
nitrogen oxides NOx, at %	48	52	54	55	55	57	60
hydrocarbon CH, at %	10	12	14	15	18	22	25
carbon monoxide CO, at %	50	65	76	85	90	94	96
smokiness, at %	60	655	68	68	70	75	80
carbon dioxide, CO_2, at %	12	16	17	18	19	20	21
Reducing of specific fuel consumption, at %	16	18	20	21	22	22	22
Without NM g / kWh	214	212	210	205	200	184	181
with NM g / kWh	180	176	175	173	170	168	165
Performance of NanoModificators: 6 - 400 l / h. Energy costs 0.5 - 1.5 kWh / t							

Increase Efficiency boilers of water-oil, fine emulsion with using NanoModificators					
Capacity up to, MW	0,5	10	25	100	300
Efficiency upgrading, at %	8-18	10-12	5-8	2-3,5	1-1,2

Increasing the yield of light fractions of petroleum refining from 5 to 22% with using NanoModificators