

TECHNOLOGY OF MICROVACUUM-HYDROAULIC CRACKING OF FUEL OIL MHC HYDROFUEL

Fuel Oil Precision Hydraulic Cracking Technology

Production of water fuel - hydrofuel

This technology, with the help of a number of condensation agents, such as shear stresses, turbulent mixing, high-frequency elastic vibrations, enhanced by non-linear sound effects, makes it possible to obtain a new type of fuel with high environmental performance.

During a decade of modernization and operation of technology in boilers, power plants and diesel engines proved fuel savings of 05% to 30% (depending on the fuel used and mixing ratio) without loss of calorific value; reducing the specific consumption of fuel oil per ton of steam generated; neutralizing excess moisture and bottom water and converting it from harmful ballast to total combustion products.

This technology allows to significantly reduce (up to 70%) harmful toxic emissions from nitrogen, carbon, sulfur and other harmful substances, reduce carbon formation and, as a result, reduce the overall wear of equipment and thereby extend the life of the engine.

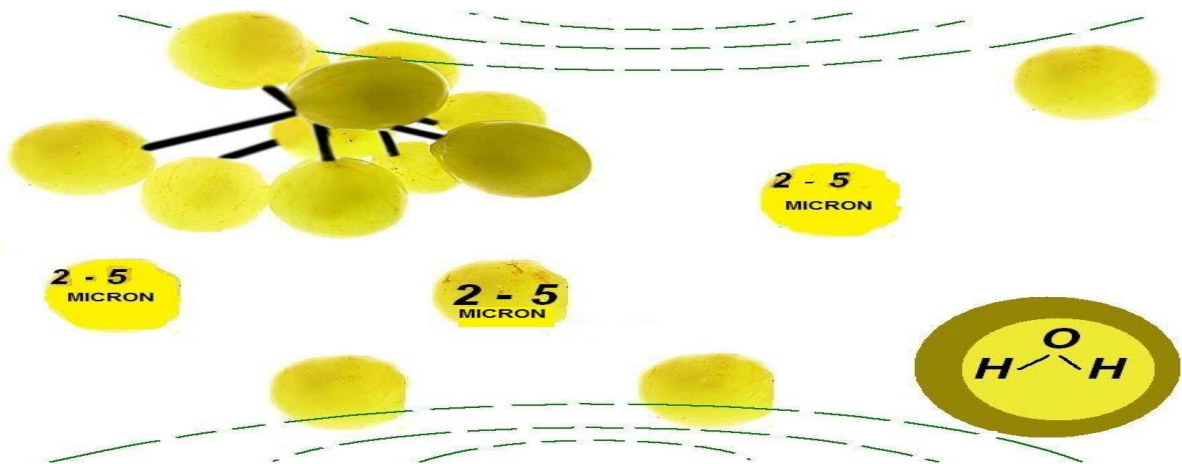
Using this technology, it is possible to reduce the cost of using liquid sludge fuel and lubricants by tens of times and convert them into full fuel. As well as the use of sulfur and soaked fuel oils in boiler rooms.

The technique uses shock cavitation effects on flowing fluid and is intended for use in the technological processes of dispersion, homogenization, emulsification and molecular destruction.

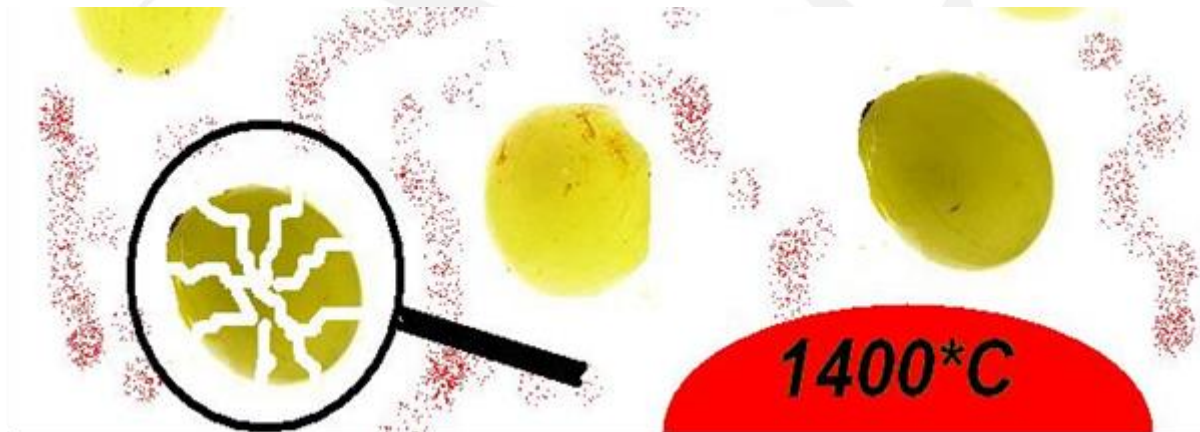
The working medium is a liquid with a viscosity ranging from 0.8 to 250, and a temperature of up to 90 ° C. By combining the action of a number of intense factors, such as shear stress, turbulent mixing, and high-frequency elastic vibrations, enhanced by nonlinear sound effects, the technology can significantly accelerate mass transfers in liquid heterogeneous media.

Processing products are characterized by a high degree of dispersion: emulsions less than 1 micron, suspensions less than 5 microns. At pressure above 8 kg/cm², our technology causes molecular destruction of raw materials.

Working with this technique on the molecules of the treated liquid leads to the rupture of long hydrocarbon chains into many small chains and their partial refraction. Processing products are characterized by a high degree of dispersion: less than 5 microns. While the nozzle makes drops with a volume of 200-300 microns.



The main factors determining the value of any fuel are its calorific value, physical properties, as well as the content of harmful impurities in combustion products. The calorific value of fuel oil is 10 to 30% higher than that of the original fuel oil.

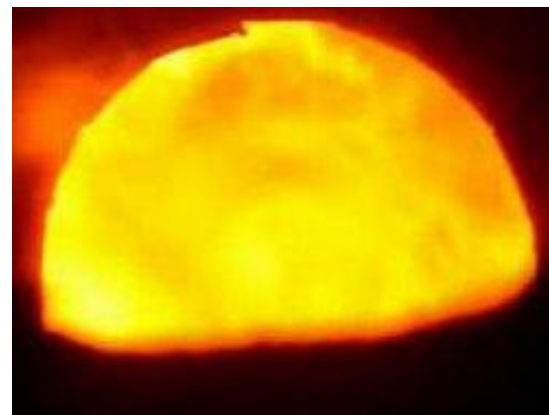


At a higher temperature, complete combustion of new hydrocarbon fuels occurs due to the intensive combustion of hydrogen in the oxygen atmosphere, the combustion temperature increases from 1350 °C to 1890 °C



The way M100 hydro-fuel oil burns

Torch temperature 1890 °C



The way ordinary fuel oil M 100 burns

Torch temperature 1350 °C

Features of the technology of micro-hydraulic fracturing of fuel oil.

- The technology can be used for various purposes and across different types, as follows:
 1. Obtaining emulsified water-resistant hydrophile fuels from heavy fuels (liquid boiler fuels and oil sludge) and diesel.
 2. Enhancing the quality of fuels and diesel, thereby improving their overall quality.
- Optimal combustion under any effort.
- Fuel economy up to (05-30)% without loss of calorific value.
- Complete combustion of fuel.
- Reduce the specific consumption of fuel oil per ton of steam generated.
- Neutralization of excess moisture and bottom water and its conversion from harmful ballast into combustion products (in boiler engines).
- A sharp decrease (up to 70%) in harmful toxic emissions into the atmosphere of nitrogen oxides, carbon dioxide and sulfur dioxide due to a decrease in the excess air coefficient from 1.53 to 1.05, a decrease in carbon composition, as a result of which an increase in the life of engines and equipment (depends on the fuel used).
- The new chemical compound (water + fuel) remains homogeneous and inseparable for at least six months (we are committed to ensuring this).
- Reduce the cost of using fuel sludge and lubricant tens of times and convert it into fully qualified and efficient fuel.
- The possibility of using sulfur and aqueous fuel oils.
- Increase the efficiency of fuel boilers up to 1.5 - 2%
- The device is installed without changing its design, without changing the system card and does not require costs to obtain its certification.
- The unit is frame-mounted and is suitable for use in both fixed and mobile version.
- Such fuel can be stored for a long time (minimum of 6 months for all type of fuel in use except for the diesel its minimum is 3 months) without changing its physical and chemical properties. When combustion, it has a high calorific value and optimal combustibility under any effort.

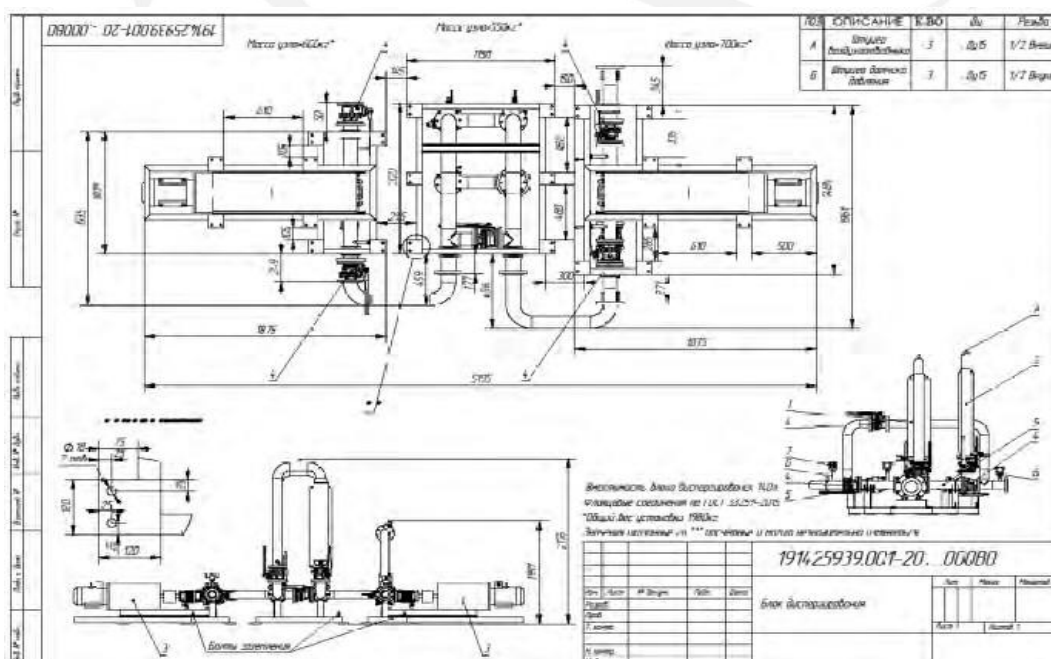
The quality of the oil-water emulsion is mainly distinguished by two indicators - dispersion and uniformity of the distribution of pellets in the dispersion medium (fuel oil). It has a stable microstructure with evenly distributed aqueous pellets in the form of a dispersed phase with an accuracy of up to 5 microns.

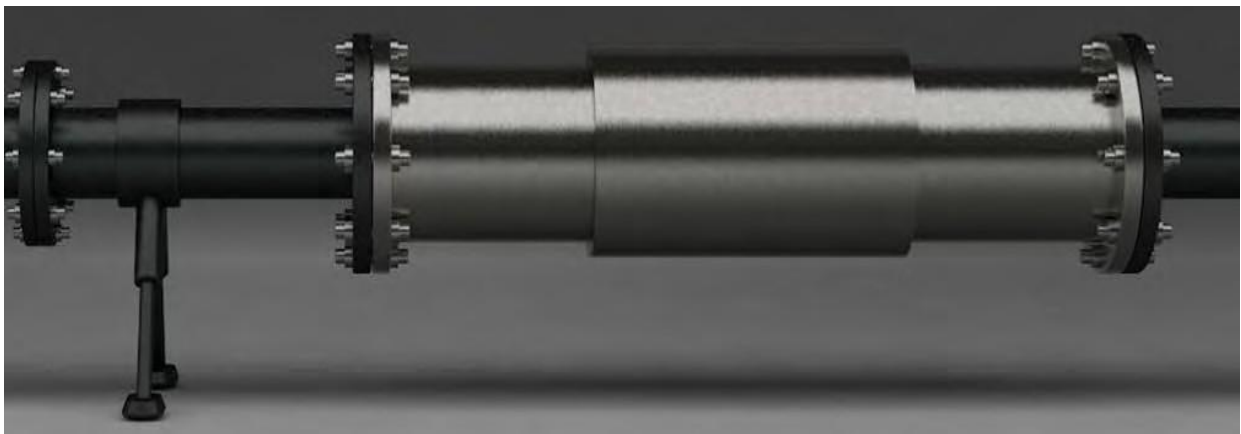
Comparative analysis of the properties of non-aqueous fuels and hydrofuel when burning

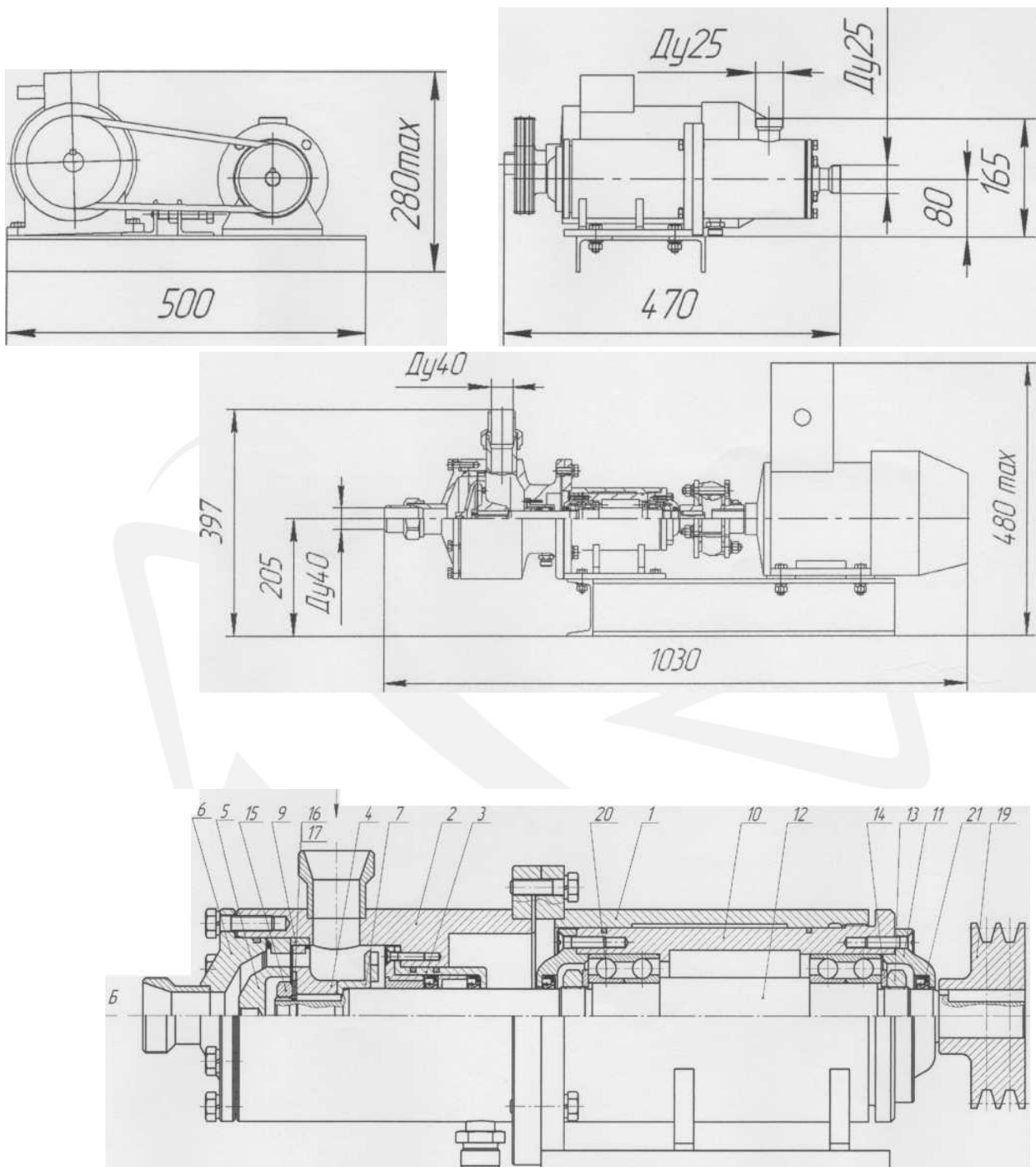
	EXHAUST TEMPERATURE t0	OUTSIDE TEMPERATURE t0	CO2 %	O2 %	EFFICIENCY FACTOR GROSS %	EFFICIENCY FACTOR NET %	CO ppm
WITHOUT WATER	233,2	27,8	8,9	10,2	80,2	84,8	30
WATER CONTENT 20%	163,4	33,3	8,1	9,1	86,1	91,1	16

Main indicators	AEP-100-25-3G-II
Maximum productivity, l / h	100 000
MPa operating pressure	0,1
/ Optimal operating range, l h	85 000... 120 000
Operating Temperature	90 – 95
Operating viscosity	29,5 – 2972
Emulsion drop size, µm	5% dispersion of emulsion droplets up to 1-10









Disclaimer: Manufacturing and installation is carried out according to the factory plan to be implemented and based on the customer's requirements and the types of fuel he wants to use(Equipment shape may vary based on customer's requirements).

Exactly

Adjustment is carried out exclusively by frequency drives operating in accordance with the specified parameters of pressure sensors for fuel oil, oil processing and / or emulsion composition, the optimal pressure is 9-10 atm. Pressure increase above 12 atm - does not lead to a noticeable increase in the degree of dispersion of the emulsion.

It is recommended to keep a record of the readings of pressure sensors and engine speeds of pumping units with changes in the properties of the processed media and their emulsions.

In the presence of contaminated media (sand, abrasives ...) One or more filters must be installed in front of the device, which must be regularly washed and cleaned. When abrasives get inside the dispersants, the service life of the device is reduced and affects its efficiency.

Precautionary measures

Distractions are allowed only for people who are trained and knowledgeable about the instructions.

If the fuel does not pass through the device (dispersers), it is necessary to compress it with steam.

In the case of unpurified fuel from mechanical impurities, the installation of filters before the disperser is mandatory. The filter must have a purity of filtration of not more than 300 microns and be located in a place suitable for maintenance.

The flow rate inside the dispersers reaches 25 meters per second. Solid particles in processing channels can cause production malfunction

If a leak or any malfunction is found, the manufacturer must be notified immediately. Without agreement with the manufacturer, any independent repair of the device is prohibited, except for cleaning and removal of impurities.

Warranty

The supplier ensures compliance with the technical specifications of the operating unit (for the dispersor). Provided that the consumer observes the conditions of operation, transportation and storage specified by the relevant sections in the attached instructions.

The warranty period is 12 months. The beginning of the warranty period is calculated from the date of operation, but no later than 6 months from the date of shipment of the entire unit to the consumer.

During the warranty period, the supplier eliminates the detected defects and malfunctions in accordance with warranty obligations.

The supplier is not responsible for the failure of dispersors due to non-compliance with the requirements for installation, operation and storage.

Warranties are not accepted in the following cases:

- Open the structure of the device or self-repair it.
- Start the device on raw materials below 50 ° C.
- Ingress of debris, remnants of gaskets, objects or other particles with a diameter of more than 1 mm.
- Operation of the device with a pressure of more than 16 atm.
- Operate the device with chemically inconsistent liquids and acids that can cause steel damage or corrosion.
- Operation of a device for processing liquid media containing abrasives - sand, etc.

During the warranty period, the supplier removes the detected defects and malfunctions free of charge by repairing the parts or completely replacing them. The repair period of faults is from 15 to 30 working days from the date of returning the undisassembled parts that do not work to the supplier, accompanied by a report explaining the causes and problem.

Any additional information required will be gladly provided.

PS:

- Specifications are subject to modification and improvement without prior notice.
- Designs and layouts may vary based on the nature of the work and client preferences.
- The product is manufactured and assembled in the United Arab Emirates.

Information about the importance of replacing regular fuel with hydrofuel

Hydrofuel is an innovative fuel consisting of water and a flammable liquid (oil or fuel). The most efficient hydrofuel for use in industrial production is a synthesis of fuel and water. Fuel and water provide more complete combustion and more economical fuel consumption, while producing less waste from burning fuel

Since the use of hydrofuel can reduce the amount of fuel used, it also directly reduces production costs. It also reduces greenhouse gases such as carbon dioxide, nitrogen oxides and sulfur oxides, thus attracting attention as a new highly environmentally friendly fuel.

The combustion of conventional fuels (diesel, gasoline, etc.) emits large amounts of harmful gases such as nitrous oxide (NO_x), hydrocarbons (HC), carbon monoxide (CO), carbon dioxide (CO₂), as well as particulate matter (PM). And black smoke. Given the widespread use of this equipment, the impact on the environment is enormous.

Environmental benefits

In terms of environmental benefits, hydrofuels are one of the alternatives to basic fuels such as oil. It can be used in unmodified diesel engines or boiler engines and can reduce nitrous oxide emissions by approximately 35% because the water in the hydrofuel lowers the local flame temperature. In addition, since hydrofuel burns more thoroughly, particulates generated by the combustion process can be reduced by approximately 60%. The use of hydrofuel also reduces the possibility of environmental pollution

Economic benefits

There are also immediate economic benefits to using hydrofuel. Water in hydrofuel improves fuel atomization and combustion efficiency, thus reducing fuel consumption. Since water boils at a much lower temperature than fuel, it evaporates easily when heated. At a “maximum superheat temperature” of about 270°C, a small explosion of tiny water droplets occurs throughout the fuel. This also allows for better mixing of fuel and air in the engine. In addition, water can also replace part of the fuel, and the energy loss is mostly compensated by increased combustion efficiency of the remaining fuel

As studies have shown, hydrofuel with a water content of 18-24% does not reduce the efficiency of the boiler. Burning hydrofuel instead of pure fuel oil can reduce the content of harmful impurities in the exhaust gases (carbon, sulfur, nitrogen oxides), significantly reducing the emission of particulate matter. All this happens due to the complete combustion of fuel.

Another advantage of hydrofuel over pure fuel oil is that it is not necessary to use pure water for its preparation. To prepare a fuel-water emulsion, waste water contaminated with oil products can be used, as well as some other materials that are completely burned in boiler furnaces.