Oil & Fuels Engineering Ltd.

REFINERY DESCRIPTION

Oil & Fuels Engineering Ltd.

Present you
Oil refining plant for the production of finished products.

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Oil treatment plant

Oil treatment plant OTP
capacity - 10-30 m3 / hour.

Oil treatment plant OTP is designed for complex oil treatment for the purpose of desalting, dehydration, removal of mechanical impurities, and viscosity reduction.

The main OTP processes are:

- liberation of the incoming watered oil from coarse emulsion water.
- weakening the stability of the emulsion by reagent.
- maximum increase in the rate of oil treatment .

The parameters of the treated oil:
- mass fraction of water,%, no more than 0.5;
- concentration of chloride salts, mg / dm3, no more than 100;
- mass fraction of mechanical impurities,%, no more than 0.05

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OTP complete set

1. Oil treatment column with a diameter of 1.6 m. and a height of 9m. - 5 pcs. (for 2 MFPU 1 column)

2. Pump unit :
- water pump for water supply - 5 pcs. (each - 50 m3/h)
- water pump for salt water discharge - 5 pcs.
- oil supply pump - 10 pcs. (Per 1 MFPU 1 pump)
- chemical reagent supply pump (proportioning unit) - 5 pcs.
- mixing pump, original design - 5 pcs.
- pump homogenizer - 5 pcs.
- pumps for pumping commercial oil - 5 pcs.
- heat exchangers - 5 pcs.
- magnetic activators - 5 pcs.
- vibrators - 5 pcs

3. Technological piping from:
- pipes Ø 50 ÷ 100 mm.
- shut-off valves
- coarse and fine filters

4. Electrical equipment, instrumentation.

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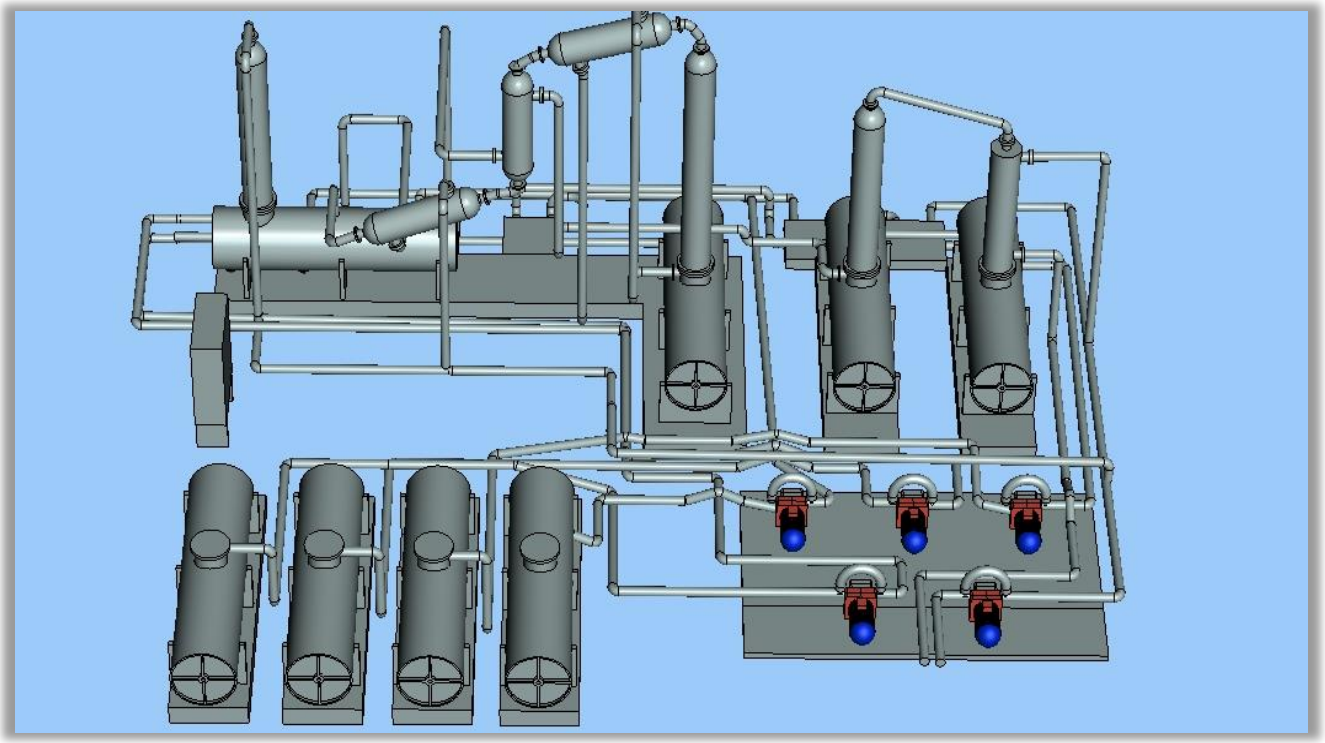
Fractionation unit



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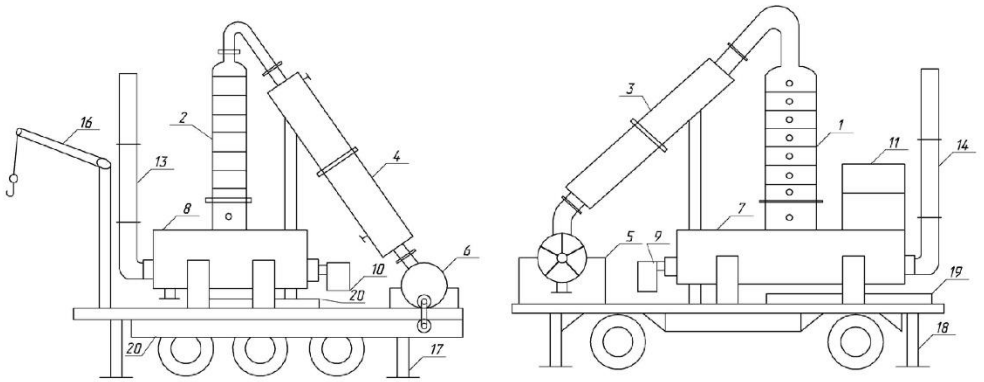
Fractionation unit



1 Distillation column gasoline unit
2 - Distillation column diesel unit
3 - Naphtha product cooler
4 - Diesel fraction cooler
5 - Fuel collector of the gasoline unit
6 - Fuel collector of the diesel unit
7 - Tote tank of the gasoline block
8 - Tote tank of the diesel unit
9,10 - Burners
11 Control panel
12 - Pump unit
13 - Vent Pipe of the diesel unit
14 - Vent Pipe of the gasoline unit
15 – Tank for the heating oil

16 - Assembly crane
17,18 - Foots support
19 - Gasoline unit heat exchanger
20 Diesel unit heat exchanger
21 - furnace oil tank

Mobile plant for processing 60 m3 of crude oil per day

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Description of the working system

- The feedstock - oil or gas condensate - is pumped from the feedstock tank under a pressure of 0.1 - 0.3 MPa into the tube space of a four-way heat exchanger, where it is heated to 60-80 ° C with heating oil with a temperature of 150 -160 ° C supplied from the tote tank. Further, the raw material heated to t 60-80 ° C is fed into a distillation column with bubble cap trays. The distillation column is mounted on a horizontal tote tank, in which a heat exchange element is mounted for the final heating of raw materials in the bottom of the column. Heating is carried out by a moduled liquid-fuel burner capacity of 0.5 MW.
- The distillation column consists of cap-type trays. A reflux exchanger is built into the upper part of the distillation column. Cooling and condensation of gasoline vapors in the reflux condenser is carried out by the process water supplied to the reflux condenser. The column top temperature is controlled by changing the amount of water supplied to the fractional distillation tube of the distillation column, through a vapor line, connected to a heat exchanger by a condenser installed vertically on a gasoline collector. Gasoline vapors are cooled in a heat exchanger-condenser, condense and drain into the collection of gasoline, from where the gasoline fraction is subsequently pumped out into the gasoline tank. The remaining heavy fraction - the stabilized bottoms residue - is pumped out of the botom tote tank by a pump, through a two-section heat exchanger in which it is cooled with water to a temperature of 60-70 C, into the furnace oil tank.
- Discharge of Bottom settlement water from a gasoline tank, as well as discharge of rainwater from the site of technological tanks is carried out into an underground tank, with subsequent removal by tank trucks. The installation meets all the requirements of sanitary standards for this equipment. The main source of harmful emissions into the atmosphere is a moduled liquid-fuel burner.

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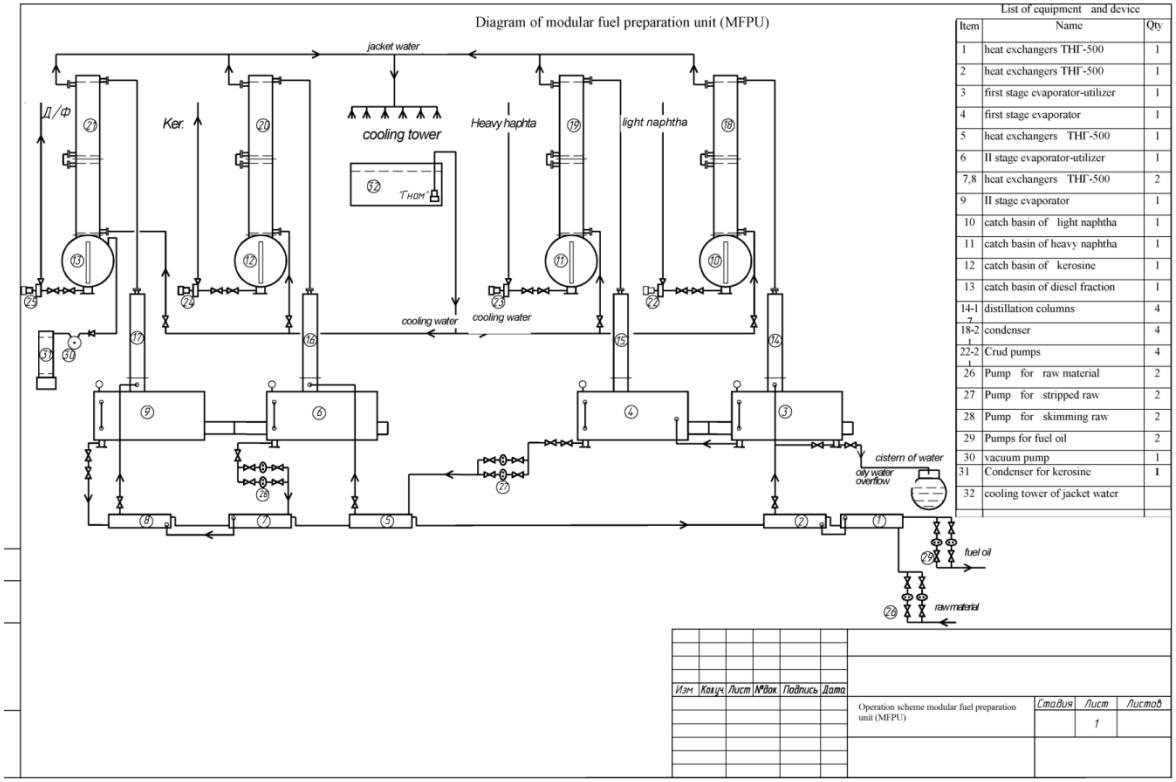
Process flow diagram of modular fuel preparation unit (MFPU)



List of equipment and device

Item	Name	Qty
1	heat exchangers ТНГ-500	1
2	heat exchangers ТНГ-500	1
3	first stage evaporator-utilizer	1
4	first stage evaporator	1
5	heat exchangers ТНГ-500	1
6	II stage evaporator-utilizer	1
7,8	heat exchangers ТНГ-500	2
9	II stage evaporator	1
10	catch basin of light naphtha	1
11	catch basin of heavy naphtha	1
12	catch basin of kerosine	1
13	catch basin of diesel fraction	1
14-17	distillation columns	4
18-21	condenser	4
22-25	Crud pumps	4
26	Pump for raw material	2
27	Pump for stripped raw	2
28	Pump for skimming raw	2
29	Pumps for fuel oil	2
30	vacuum pump	1
31	Condenser for kerosine	1
32	cooling tower of jacket water	

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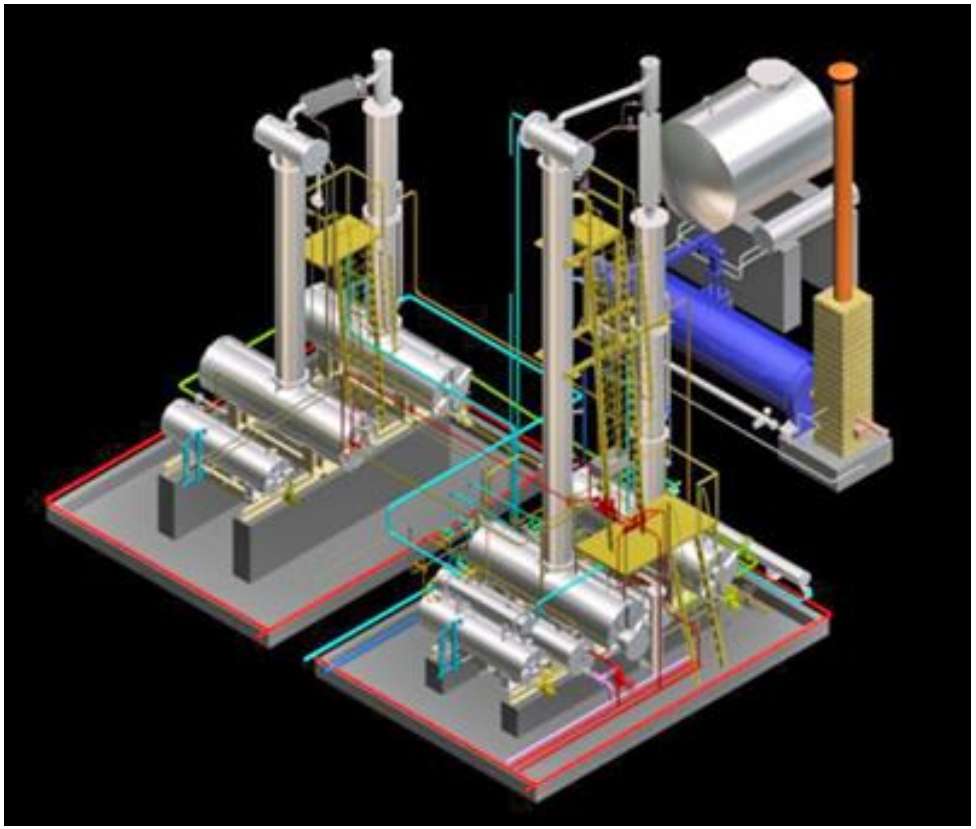

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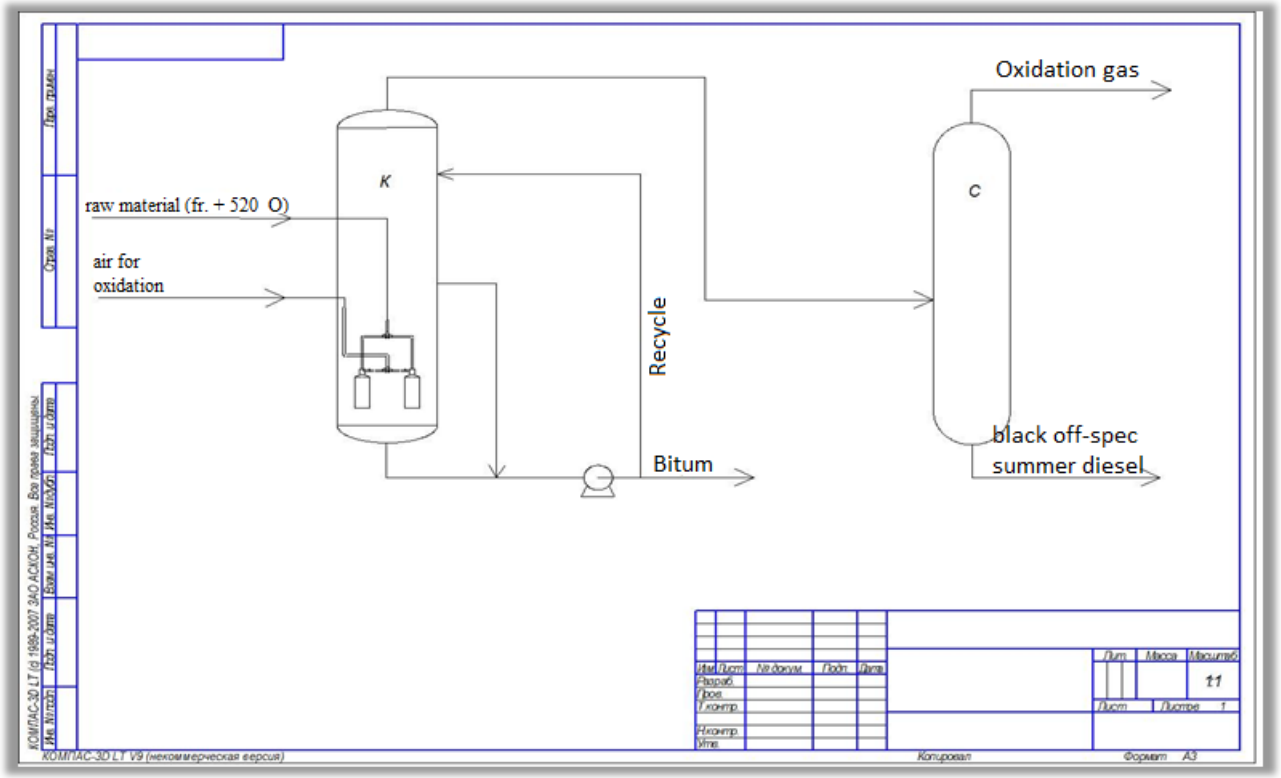
Oxidating unit



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Catalysis unit

* Raw materials are pumped in two streams to columns K-1 and K-2, where they are heated to 60 ° C. Light fractions are fed through a heat exchanger to the commodity park for mixing with gasoline leaving the column K-3 (we get AI-92).

* The heavy residue of the gasoline fraction from the bottom of the columns K-1 and K-2 enters the vertical furnace P-1, where it is heated to 350 ° C and then the vapor-gas mixture enters the reactor R-1, where the catalyst is located.

* From the reactor, the mixture cooled in the heat exchanger enters the C-1 separator to separate light gases (C1 and C2), which are burned in the nozzles of the furnace.

* After that, the mixture enters the column K-3, where gasoline is stabilized. Light hydrocarbons, propane-butane mixture is removed from the C-2 separator, and the heavy part from the bottom of the column goes for mixing to the warehouse.

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The technology of preparation of the oxidized road bitumen with gas liquid cavitation vortex apparatus (GLCVA)

Aimed at the production of oxidized bitumen, which allows to increase the productivity of the Plant and achieve a stable quality of the obtained bitumen up to the requirements of GOST.

The advantages of the proposed system

* Absence of mother water.
* Reducing the content of oxygen in the air in oxidation gases.
* Increase in productivity on raw materials by 2-2.5 times.
* Reducing oxygen of air for oxidation by 25-30%.
* Reducing the output of black off-spec summer diesel.
* Reduced oxidation time
* Decrease in the temperature of the oxidation reaction 20-30 ^{0}C

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Storage, transportation of fuel in hot climate and sandy, rocky terrain

Problems

* Extreme temperature operation, ultra-high and low temperatures
* Intense solar radiation. Maximum additional protection required for equipment and materials
* Excessive irrigation leads to accumulation of salt in the soil
* Complex logistics: deserted, waterless and off-road areas
* Increased construction costs during the construction of stationary objects due to bulk sand or rocky soil
* Increased wear and tear of equipment and materials
* Due to sand drills, additional protection of machines, equipment and mechanisms is required, as well as insulation coating
* Increased requirements for construction speed and organization

Solving

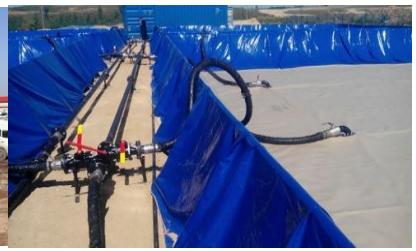
STORAGE Polymer Elastic Tanks (PET)

Acceptance, dispensing, storage of fuel and other liquids in the field based on polymer elastic PER tanks designed for high-temperature and extreme operating conditions

TRANSPORTATION Flat hose main pipelines

Pipeline pumping of petroleum products, fuel and lubricants, water and technical liquids over long distances in the field in rough terrain using flat hose pipelines



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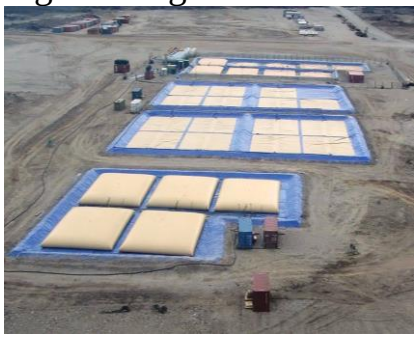
BENEFITS OF THESE SOLUTIONS

* 70% cost cap savings vs. traditional approaches
* Successful experience in hot climates
* Mobility and compactness (delivery of equipment by any mode of transport!)
* Reduction of construction cost and time
* Quick installation on unprepared surfaces
* 100% fuel polyurethane
* Extreme operation mode: from -50 to + 80,
* Corrosion and environmental protection. Abrasion resistant material, MIL-T compliant protection level (USA)
* Seismic stability
* Quality control ISO 9000
* Compliance with tactical and technical characteristics of NATO and US Military standards
* Re-use is provided
* Wide range of applications for all types of liquids, including drinking water

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Fuel depot

Creation of operational fuel reserves, as well as their reception and shipment by all modes of transport (road, railway, water and pipeline).

Pump and dispenser module

Tank farm

Piping arrangement

Fuel dispensing area

Loader

Fuel quality control laboratory

Storehouse

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Main elements of fuel depot

Tank farm

Pump and dispenser module

Piping arrangement

Fuel dispensing area

Fuel quality control laboratory

Loader

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