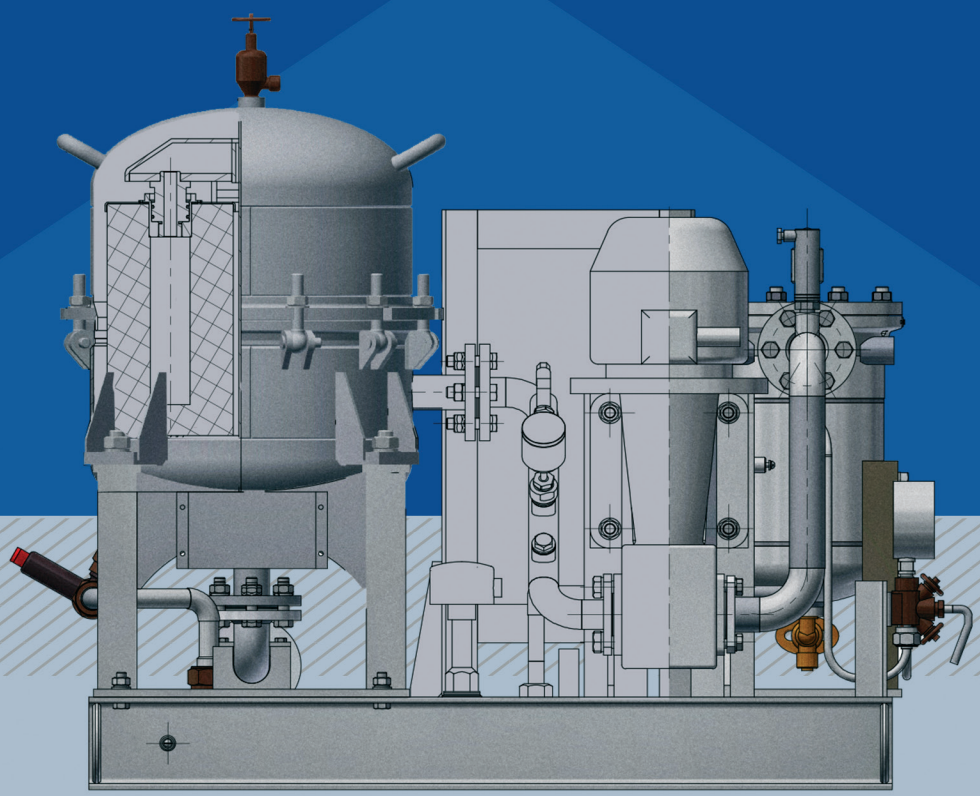
VINETA
ENGINEERING PLANT

Fuel preparation equipment

1.0

- Fine fuel filter – separator ФСТ type
- Fuel filter ФТ type
- Diesel fuel separation unit БС type
- Diesel fuel static automatically controlled separation unit
- Oil separation unit БСМп type
- Б-3В and Л3-КТ3 oil separation unit БСП type
- Oil separation unit with heating БСП type



Fuel preparation equipment

The contamination of oil products starts at petroleum refineries and continues along the whole transfer chain up to feed tanks of the equipment, they are used in.

The ingress of moisture into oil products is inevitable. It occurs owing to small and great tank breathing during the storage or the dissolution of air in the form of frost from tanks' walls and in other similar way. The assurance of the high quality of oil products shall include a complex of measures to remove all or majority of contaminations.

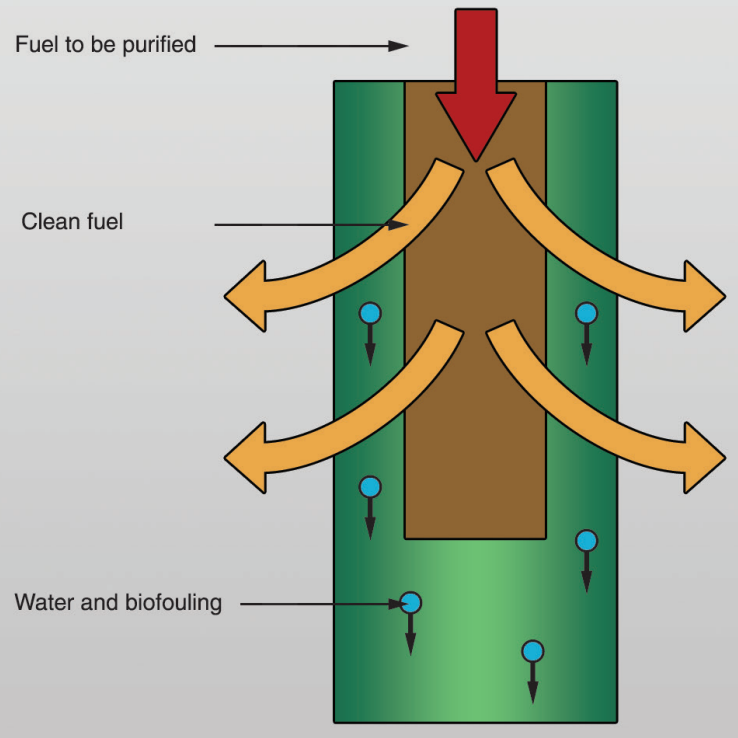
Various filters are traditionally used to remove mechanical impurities only. The usage of centrifugal separators to purify fuel from water and other mechanical impurities is limited because of the complexity and high cost of the equipment, as well as complexity and labor-intensive characteristics of its correct adjustment and service.

The problem of the complex purification of light oil products can be most effectively solved using poromeric materials as filter elements at different stages of their production, transportation, storage and operation.

Such materials as filter elements for fuel and oil filters have been used since late 70s, mainly on river-type vessels. Solid experience and large-scale implementation of poromeric materials on river-type vessels have revealed their good ability to absorb water and other mechanical impurities out of fuel and safely hold them. The material revealed extremely high effectiveness as the final filter and moisture absorber. For the last years, Russian scientists have founded a poromeric material securing controlling of such characteristics as water absorption, pore size, general porosity, durability, elasticity and so on, at the stage as early as its production, which allowed to get

Mode of filter element's operation

pic.1 Filter element



pic.2 Scheme of the filter element's operation

the material with the uniform porous structure and found filter elements of various forms and sizes out of it. This filter element is able to not only effectively absorb water and mechanical impurities out of oil products, but continuously self-purify from accumulated water during the operation.

As the water is absorbed out of oil products, large water drops form inside the poromeric structure of the filter element. Under the action of gravity, these drops move inside the poromeric structure to the lower part of the filter element. Shall the drop be pushed outside the surface under the influence of oil products' flow, it is not entrained by the flow, but slides along the filter element surface (as rain spots along window pane). As drops are accumulated in the lower part of the filter element, they drain into the settling tank (pic. 1).

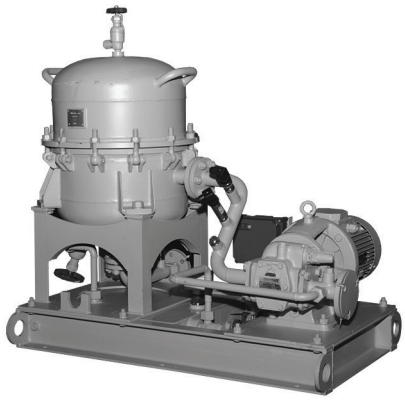
Such principle of the filter element operation provides the high efficiency of oil products' purification from water. Apart from water, owing to the poromeric structure, the filter element of such type effectively removes mechanical impurities. At that, the middle size of pores significantly exceeds the size of retained particles.

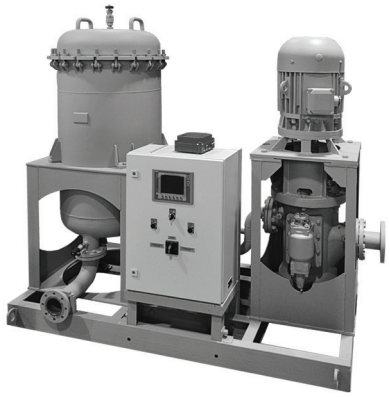
The effective purification is secured by the filter material volume and large pore tortuosity (the labyrinth effect).

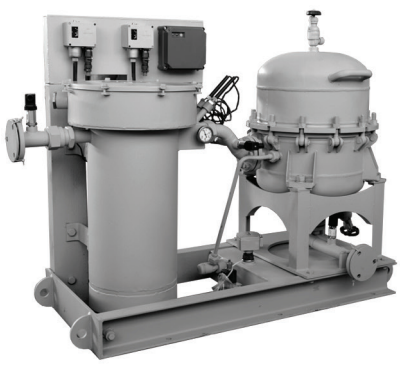
During the filtration, quite a significant part of mechanical impurities is not hold on the surface, but got inside the filter element, where they, to a significant degree, are picked up by the flowing down water drops. As a whole, the presence of water traces in the purified fuel and moisture of the filter element itself have a good influence on the removal of mechanical impurities. At that there take part the partial filter unloading from mechanical impurities, absorbed during the operation.

The full unloading from mechanical impurities is carried out through its washing with domestic detergent and pressing out (without drying), allowing repeated unloading of filter elements.

The technology to purify oil products, based on the usage of filters out of FIMAX material, allows to purify oil products from water, water-soluble acidities and alkalis, mechanical impurities and biofouling simultaneously and qualitatively, with the help of one filtering element. At that, the purification from water is continuous, which is highly important for watered products. The amount of separated water is not limited.







Fine fuel filter — separator ФСТ type

Function and technical data

- The filter-separator is intended for the separation and fine cleaning of diesel fuel, gas turbine, hydraulic and motor oil from mechanical impurities, water and biofouling.
- **Medium**
  - diesel fuel under ГОСТ 305;
  - Тп-22, Тп-46 hydraulic oils under ГОСТ 9972;
  - motor oils for diesel engines under ГОСТ 12337;
  - oil for marine gas turbine under ГОСТ 10289
- **Temperature of the medium, °C:**
  - fuel: from +5 up to +60
  - oil: up to + 80

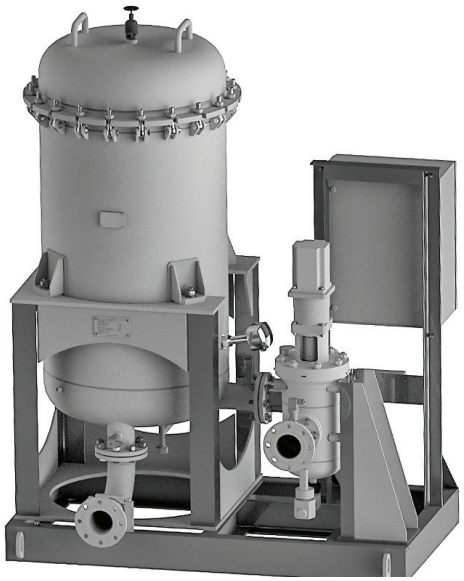
Technical data, main parameters and characteristics

Name	Value		
Index	**ФСТ40/10**	**ФСТ50/10**	**ФСТ50/4**
DN	40	50	50
L/W/H	458/ 547/ 785	730/ 760/ 842,5	630/ 660/ 960
Dry weight, kg	72	140	123,1
Filtration degree, mcm	5,0	5,0	5,0
WP, MPa	1,0	1,0	0,4
Capacity, m³/h	fuel: 3,0 oil: 1,5	fuel: 5,0 oil: 2,5	fuel: 5,0 oil: 2,5
Water removal efficiency (initial content up to 3%)	trace amount of water		
Maintenance area (availability)	height of the filter element removal		
Control board	–	yes/separately	–

Fuel filter ФТ type

Function and technical data

- The filter is intended for the separation and fine cleaning of diesel fuel from mechanical impurities, water and biofouling.
- **Medium:**
  - diesel fuel under ГОСТ 305; ГОСТ 32511; ГОСТ Р 52368
- **Temperature of the medium, °C:**
  - max +62



Technical data, main parameters and characteristics

Name	Value
Index	**ФТ80/25-15**
DN	80
L/W/H	1030/1330/1780
Dry weight, kg	750
Filtration degree, mcm	15
WP, MPa	0,4
Capacity, m³/h	25
Water removal efficiency (initial content up to 3%)	trace amount of water
Maintenance area (availability)	height of the filter element removal
Control board	yes/separately

Diesel fuel separation unit БС type

Function and technical data

- The unit is intended for the separation and fine cleaning of diesel fuel (except БС 3,0/2,2-5М – is intended to clean and separate gas turbine, hydraulic and engine oils) from mechanical impurities, water and biofouling.
  - the unit is controlled from the control board. Remote control is also possible.
  - the control board can be installed either on the frame itself or separately at a service-friendly area.
  - the pressure drop, which manifests the degree of pollution of the separation unit, is controlled by pressure sensors.
- **Medium**
  - diesel fuel under ГОСТ 305 (except БС 3,0/2,2-5М)
  - gas turbine oil under ГОСТ 10289 (only БС 3,0/2,2-5М)
  - hydraulic oils under ГОСТ 9972 (only БС 3,0/2,2-5М)
  - motor oils for diesel engines under ГОСТ 12337 (only БС 3,0/2,2-5М)

Technical data, main parameters and characteristics

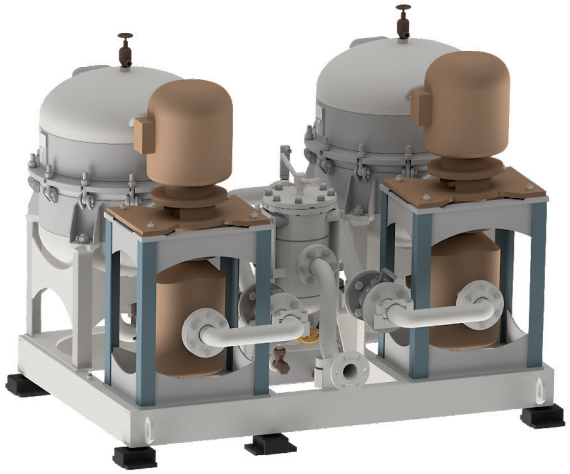
Name	Value					
Index	БС 1,0/1,1-5	БС 1,5/1,5-5	БС 3,0/2,2-5	БС 3,0/2,2-5М*	БС 10/6,1-5 (left/right)	БС-25/7,5-5
DN	20		40		50	80
WP, MPa (kgf/cm²)	0,4 (4,0)				1,0 (10,0)	0,4 (4,0)
Capacity, m³/h	1,0	1,5	3,0	1,5	12,5	21,0
Temperature of the medium, °C	max +60		max +62	max +75	max +62	
Weight (control board on the frame/separately), kg	155/125	156	350/230	260	799	1010
Overall dimensions (control board on the frame, separately), LxWxH, kg	761/481/1260, 761/481/886	800/523/966	1220/832/ 1005, 1136/ 665/ 1005	1147/665/1017	1380/ 1140/ 1828	2029/ 935/ 1833
Filtration degree, mcm	5,0				15	
Max permissible pressure drop under the filter clogging at nominal capacity, MPa	0,08					
Water removal efficiency (initial content up to 3%)	trace amount of water					
Maintenance area (availability)	height of the filter element removal					

*oil heating is required. The heater is not included in the scope of supply.

Diesel fuel static automatically controlled separation unit

Function and technical data

- The unit is intended to clean diesel fuel from mechanical impurities, water and biofouling in ship (marine) systems.
- **The unit has the following operating modes:**
  - fuel transfer from back-up fuel tanks
  - direct separation from back-up fuel tanks to feed systems
  - fuel annular separation in back-up fuel tanks
  - freeing of back-up fuel and feed tanks
- **Medium:**
  - diesel fuel under ГОСТ 305
  - Euro diesel fuel grade C under ГОСТ 32511; ГОСТ Р 52368, Л-62В under ГОСТ РВ 9130-002 with its closed flash point being not lower than 62 °C



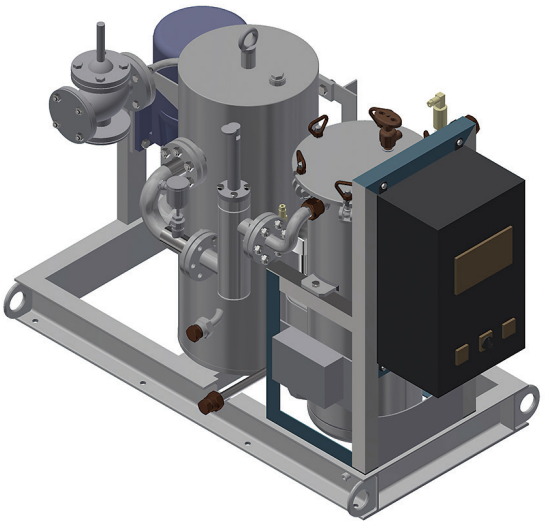
Technical data, main parameters and characteristics

Name	Value	
Index	**ССАФ-5**	**ССАФ-10**
DN	50	
WP, kgf/cm²	4,0	
Capacity, m³/h	5,0	5,0 x2
Temperature of the medium, °C	max +62	
Weight, kg	406	850
Overall dimensions, LxWxH, mm	1805/ 650/ 1210	1590/ 1263/ 1141
Filtration degree, mcm	5,0	
Power input, kW	3	6
Max permissible pressure drop under the filter clogging at nominal capacity, MPa	0,08	
Water removal efficiency (initial content up to 3%)	trace amount of water	
Maintenance area (availability)	height of the filter element removal	

Oil separation unit БСМп type

Function and technical data

- The unit is intended to heat, fine clean and separate diesel fuel from mechanical impurities, water and biofouling.
- **Medium:**
  - motor oils according to the restrictive list under ГОСТ РВ 50920
  - Тп-22, ТП-46 oils under ГОСТ 9972
- **Temperature of the medium, °C:**
  - from 5 up to 70
  - the heating is carried out with the help of the steam heater



Technical data, main parameters and characteristics

Name	Value
Index	БСМп-1,0
DN	25
WP, MPa	0,4
Capacity, m³/h	1,0
Weight, kg	330
Overall dimensions, LxWxH, mm	1404/788/995
Filtration degree, mcm	5,0
Power input, kW	1,3
Max permissible pressure drop under the filter clogging at nominal capacity, MPa	0,08
Water removal efficiency (initial content up to 3%)	trace amount of water
Maintenance area (availability)	height of the filter element removal

Б-3В and Л3-КТ3 oil separation unit БСП type

Function and technical data

- The unit is intended to heat and clean hydraulic oils from mechanical impurities and water in ship (marine) systems
- All units are to be mounted on-site as per customer requirements
- **Medium:**
  - Б-3В hydraulic oil under spec.38.101295-85
  - Л3-КТ3 hydraulic oil spec.0253-021-56194358-2008
- **Temperature of the medium, °C:**
  - Max +70
  - the heating is carried out with the help of the electric heater

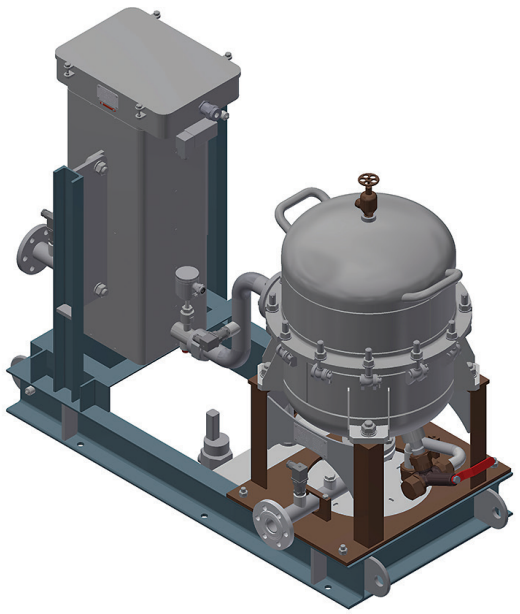
Technical data, main parameters and characteristics

Index	Value	
Index	БСП-02	БСП-02 with electrical pump unit
DN	50	
WP, kgf/cm²	0,4	
Capacity, m³/h	1,5	
Weight, kg	280	320
Overall dimensions, LxWxH, mm: - oil filter-separator DN 50, WP 4 - fine fuel filter DN 50, WP 4 - heater ПМП-1500 - electrical pump unit - control board	 590/855/1145 502/620/725 448/281/775 - 600/250/800	 590/855/1145 502/620/725 448/281/775 520/ 240/ 285 600/250/800
Filtration degree, mcm	5,0	
Power input, kW	43,0	44,0
Max permissible pressure drop under the filter clogging at nominal capacity, MPa	0,08	
Water removal efficiency (initial content up to 3%)	trace amount of water	
Maintenance area (availability)	height of the filter element removal	

Oil separation unit with heating БСП type

Function and technical data

- The unit is intended for the continuous fine cleaning of oil from the mechanical impurities, water and biofouling in ship (marine) systems
- Control board can be mounted both on frame or separately
- **Medium:**
  - hydraulic oils under ГОСТ 9972
  - motor oils for diesel engines under ГОСТ 12337
  - oils for marine gas turbines under ГОСТ 10289
- **Temperature of the medium, °C:**
  - Max +70
  - the heating is carried out with the help of the electric heater



Technical data, main parameters and characteristics

Name	Value
DN	40
WP, MPa	0,4
Capacity, m³/h	1,5
Weight, kg	305
Overall dimensions, LxWxH, mm	1407/596/1006
Filtration degree, mcm	5,0
Power input, kW	44,0
Max permissible pressure drop under the filter clogging at nominal capacity, MPa	0,08
Water removal efficiency (initial content up to 3%)	trace amount of water
Maintenance area (availability)	height of the filter element removal

Notes

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