



OTS

Oil-Treatment-Systems

Deep-Finest-Filtration and Water separation

Preamble

Sand, dust, rust, sodium as well as even **water** create problems, if they are included in mineral-oil, such as lubrication oil. Mechanical separators, main-stream filter, automatic filter, sieves as well as cascade-tanks are not suitable for oil treatment and besides not capable to reach the necessary fineness and rest-water content. Moreover they do not prevent the colonization of the liquid mediums with micro-organisms !

Mechanical separators, such as centrifugals as well as main-stream filter usually reach a filtration-fineness of about 25-40 µm particle size. Latest surveys have shown, that even the 5-25 µm sized particles, which are occurring in the lubrication and hydraulic oil causes an enormous abrasive effect, maximum wear and therefore the sudden breakdown of the plant.

Water as a result of humidity condensation as well as those, which entered the lub-oil tanks through leaky lub-oil cooler or shaft-packings endangers either directly or indirectly the function of the plant.

The water-content in the lub-oil directly reduces the lubrication effect and is as the decisive factor indirectly responsible for the micro-organism-growth, which itself causes corrosion, the pH-value reduction and the plant blocking.

For more and detailed information see also the NFV brochure „Diesel oil pest“.

The development of environment-friendly filter-elements for highest fineness, having a high purity and excellent back-holding abilities (β -rate) as well as the development of a new coalescer element for water separation, especially for higher-viscous oil enables the NFV to design a full automatic **Oil Treatment Plant Type OTS**, which is proved and approved by the „Germanischer Lloyd“.

Advantages of the oil treatment with NFV OTS-type Oil Treatment Systems

1. less energy-consumption
2. low maintenance costs
3. very good back-holding abilities, therefore very good particle separation of about 99 %

4. continuous water separation out of lub-oils (also high water concentrations of 15 Vol.-%) up to rest water concentration of about 20 ppm through that
 - prevention of micro-organism attack and - growth,
 - prevention of the pH-value reduction
 - avoidance of tank-corrosion
5. less consumption costs caused by longer periods of time the oil is in operation
6. environment-friendly recycling of the material

OTS-plants are available for

- continuous bypass treatment
- main stream treatment
- lub-oil-treatment for gear boxes for e.g. pumps, turbines etc.
- navy application i.e. shock- and jog-proofed as well as amagnetic execution

and can additionally be tailored to customers demand and be designed as stationary plants as well as wheel-beared for mobile usage.

Design

The plant in particular consist of the main-parts pump with additionally fitted pressure-relief-valve, a deep-finest filtration element (first stage) , a coalescer element with integrated permanent separator (second stage), a control box, a differential-pressure control device, automatically operated vent valve and a new developed water drain with stopcock.

The system is mounted on a base frame above a leakage-basin, operates automatically and meets the requirements of the „Deutsche Bundesmarine“ as well as the power plants and the of the turbine and engine producing industry.

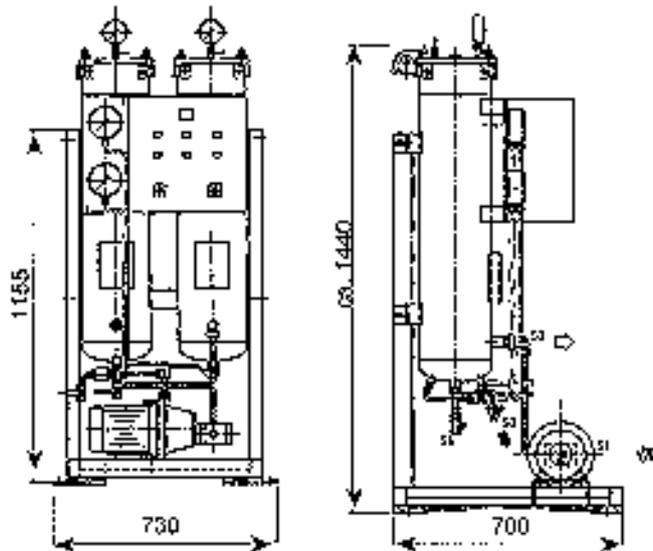


Fig. 1: Oil-Treatment-Plant type OTS 16, having a capacity 16 l/min

Function

The feeding pump, a gear pump, which is equipped with a pressure relief valve, pumps the medium via pipings into the first stage, a deep-finest filter, where the waste-particle separation performs.

The medium, now precleaned, flows, forced by the same pump in radial direction from the inner to the outer side through the second stage of the plant, the separator/ coalescer unit.

The coalescence principle based effective phase separation performs in the special designed glas-fiber structure of the coalescer by the connection of the very small oil droplets from the dispersion of the to be extracted phase to bigger ones, which are collected on the outer surface of the separator element. Outside the coalescer element these drops sinks, forced by gravity into the water collecting chamber, located in the lower part of the coalescer/separator stage and can periodically be drained.

To reach optimal separation results on smallest space, NFV-Oil-treatment plants are additionally to the phase separation element/coalescer equipped with a water-refuse membrane.

This combination with the „separator“ called membrane dewateres the fuel up to residual contents of a few mg/l and reduces the sodium-particles content up to 0,5 mg/l.

Remark:

The output of any NFV OTS-type Oil Treatment Plants depends on the temperature and the viscosity of the medium. Each information, given in this brochure based on a temperature of 20 ° C and the appropriate viscosity.

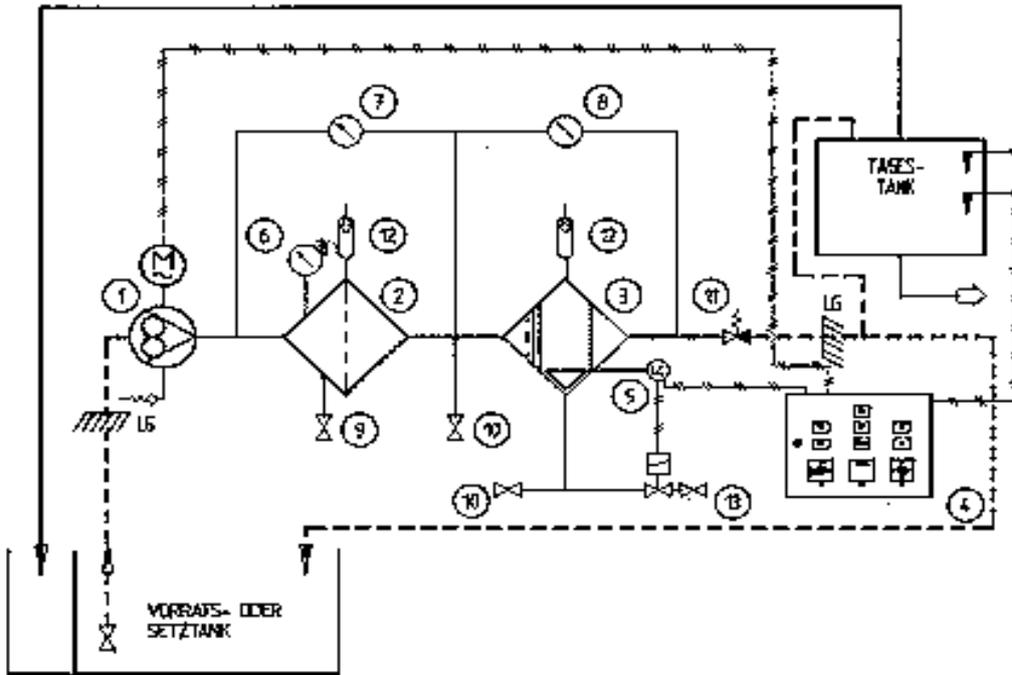


Fig. 2: Flow schematic of a OTS

1. Gearpump with pressure relief valve
2. Deep-finest filter-element
3. Two-stage coalescer/separator
4. Control-box
5. Water level measuring device
6. Manometer
- 7.+ 8. Differential pressure gauge
9. Drain and sludge outlet valve for deep finest filter
10. Drain valve for coalescer/separator
11. Pressure maintaining valve
12. Automatic vent valve
13. Automatic water drain with stopcock
14. Preheating device (can optionally be fitted for lub-oil with a high viscosity)