

New compact and economical solution for effective dewatering of all oils in thrusters and stern tubes

by Mr. Marco van Boven, C.C.JENSEN A/S, June 2020

C.C.JENSEN recently introduced the compact Desorber type D5 for removal of all kinds of water, salt, and solid contamination from hydraulic and gear oils. We have used existing proven technology from our Desorber D10 to develop a smaller and more compact price-competitive solution to smaller oil volumes.

Bio-degradable fluids and legislations

In various industries we have witnessed more frequent use of bio-degradable fluids. In the majority of these markets like Marine, Oil & Gas and Mobile Equipment, this trend is driven by legislations. The advantage of bio-degradable fluids relates to the reduced environmental impact in case oil leakage occurs. There are strict regulations that define when a fluid can be labelled as an EAL (Environmentally Acceptable Lubricant) that includes criteria related to biodegradability, toxicity, and bioaccumulation potential.

Most common EAL labelled fluid types are HEES (Hydraulic Environmental Ester Synthetic), HETG (Hydraulic Environmental Triglyceride), HEPG (Hydraulic Environmental Polyglycol) and HEPR (Poly- α -olefin).

Damages due to water ingress

For market segments Marine, Offshore, Mobile, and Industrial hydraulics the ester based HEES fluid type is often used. Water can ingress in the hydraulic or lubrication system for example through seals, vent ports, condensation, and breathers. When observing the presence of water in oil we can define various stages namely dissolved, emulsified, and free water. The presence of these stages depends on the amount of water that has entered the system and the amount of water the oil can dissolve.



*CJC® Desorber/Filter
Combi Unit D5*



Oil degradation

Unfortunately, a degradation process starts when water ingresses the system. Given the requirement that the oil must meet biodegradable criteria, this degradation process is a logic result because of the required behaviour of the oil when exposed to water. But this degradation process, called hydrolysis, will shorten the lifetime of the oil. For HEES oils, the hydrolysis stability depends on various aspects like the chemistry of the oil, additives, catalysts, amount of water present and oil temperature.

A negative side-effect is that the quality of the lubrication film will most often be negatively affected with increasing water level in the oil. As such, more contamination will be generated by the system due to component surfaces being damaged, resulting in an increased level of metallic contamination in the system.

The CJC® Technology

C.C.JENSEN has promoted the Desorber product range for more than 15 years, representing a proven technology to remove all kinds of water from hydraulic and lubrication fluids including HEES ester based types.

This technology is based on a controlled process that releases chilled air in warm oil in a dedicated vessel. The chilled air is pushed by a fan through an air distribution module present at the bottom of the Desorber. The chilled air will expand once released in the warm oil and travel upwards. Due to the expansion of the air bubbles, the water is effectively removed from the oil. In the upper part of the Desorber, the warm humid air is pushed by the forced air flow through a condenser.

The water is removed as a liquid from the air through a discharge pipe. A major benefit is, that the discharged water is visible because it is collected in a drum or tank. The amount of water removed from the system is measurable and hence the Desorber is a good indicator for the amount of water which has entered the system.

Component failures

If we consider a thruster or stern tube of a vessel, we arrive to an average amount of water removed per day. In case the daily amount of water removed increases, it can implicate that a seal has been damaged. Due to the high water removal capacity of the Desorber, the vessel can continue to follow its schedule, however the crew is notified that in this case a seal inspection is required in the future.

No oil foaming

Another important characteristic compared to vacuum purifiers is, that the Desorber does not apply a vacuum. Utilizing a vacuum increases the risk of oil foaming, in particular with increased amounts of water the oil may become more vulnerable for oil foaming. When oil foaming occurs, the vacuum purifier



needs to stop until the foam has disappeared. During this time the water removal process is stopped.

Solution

The CJC® Desorbers are used for a wide variety of applications. In markets like Marine, we have noticed that also smaller sized systems like bow thrusters and stern tubes are upgraded with a biodegradable fluid. For system with oil volumes up to appr. 1,200 ltr., C.C.JENSEN has now designed and introduced the compact CJC® Desorber/Filter Combi Unit D5.

Easy installation of CJC® Desorber ranges

For all the CJC® Desorbers in general, we apply the principle of ease in installation and functioning. Only electricity is required, and with a simple start / stop function it is very easy to operate.

The CJC® Desorbers can be combined with an offline oil filter to remove solid contamination like metal particles from the oil. Also salt and oil oxidation / varnish products are removed by the CJC® Filter Inserts. Because the CJC® Desorber removes various types of contamination, we delay the aging and degradation process of the oil. Given the high oil price of EAL approved fluids, the extension of the fluid lifetime direct results into lower operational cost. For ships it implicates the CJC® Desorber keeps the oil in good condition for the defined period of 5 years between pre-defined inspections.