

# PH<sub>2</sub>OENIX™ MEMBRANE PURIFIER IMPACT STORIES



## US COAST GUARD P.A.G. - EAL (ENVIRONMENTALLY ACCEPTABLE LUBRICANTS) WATER AND SALT REMOVAL

The US Coast Guard is the first US Fleet to replace the oil in any of its hydraulic systems such as CPP (Propeller Pitch Control Systems) that may allow flow of oil into the environment (due to seal leaks). The USCGC is currently changing from mineral oils to EAL Environmentally Friendly Lubricants and has chosen PAG (Poly-alkylene Glycol). PAG was chosen since it is both biodegradable and does not form a sheen on top of the water in the event of a leak.

Although PAG lubricants have many benefits they also have a high ability to absorb water which is miscible in the lubricant to a very high level which overtime may damage the system. In addition, typical water removal technologies such as centrifuges, water absorbing filters and coalescers are unable to remove water contamination. Therefore, Dehydration is the only technology which will work to remove damaging water contamination from these fluids, however typical oil dehydrators are both expensive and cumbersome to use onboard ships.

The US Coast Guard purchased two PHoenix™ C4 -4 gpm carts in 2016 for use on several ships that have had either seal leaks or sea water cooler leaks into their systems. The Coast Guard uses the PHoenix™ on several ships since it is easy to move around, is simple to hook up and run on 110V and is effective in removing both water and dissolved salts from hydraulic fluids.

It has been found that when oil contaminated with sea water is dehydrated that the salts brought in by the sea water will precipitate out into crystals since they are no longer miscible in the oil and then are removed as particulate by the PHoenix™ particulate filter. See image 2 for details.



Figure 1: PHoenix USCG Various Installs

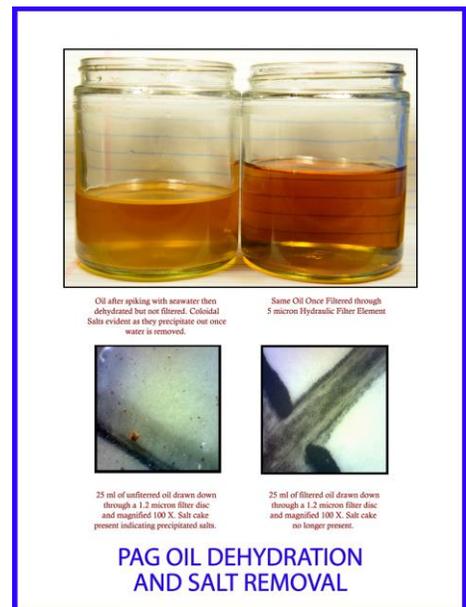


Figure 2: Dissolved Salt Removal PAG