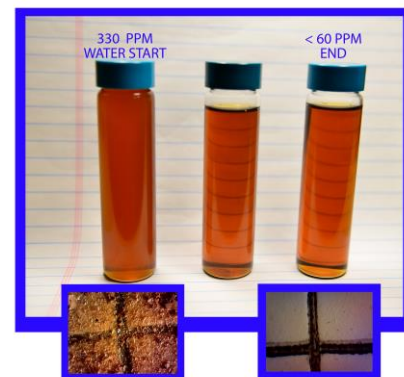


# PH<sub>2</sub>OENIX™ MEMBRANE PURIFIER IMPACT STORIES

## MARINE APPLICATION 1 - WATER REMOVAL FROM TUG BOAT Z DRIVE SYSTEMS

A local tug boat company was having difficulty keeping water out of its port side z drive system. The Z drive is critical to the boats operation since it is the drive system that allows the prop to turn 360 degrees around in the water. The customer had been using water absorbing filters for years but had to change them frequently and at a high cost. In addition over time they began to find them ineffective in keeping water below the saturation point of their 220 weight gear oil.

The Customer purchased a PHoenix™ C1 gpm cart to be installed on their 250 gallon z drive system. Water levels on the system initially came in at 330 ppm with the oil being hazy while Iso particulate cleanliness counts came in at over 21/20/19. After 6 days on the system water had dropped to 88 ppm with iso counts reducing to 18/16/14 and after 12 days reduced to a water level of 52 ppm and iso counts now down to 17/15/13.



TUG BOAT Z DRIVE PHOENIX C1  
WATER AND PARTICULATE  
REMOVAL RESULTS

Figure 1: Phoenix Z Drive Results.

## MARINE APPLICATION 2- WATER REMOVAL FROM STERN TUBE LUBE SYSTEM MAERSK CONTAINER SHIP

A large container ship company was interested in trialing the PHoenix™ on their stern tube lube system to qualify effectiveness. Water removal is becoming increasingly important due to regulations requiring EAL (Environmentally Friendly Lubricants) in these systems which are hydrophilic. Over time if water levels are not controlled it can lead to acid formation in the lubricating systems and potential premature failure of system components. A PHoenix™ C4 was installed on the system and while the ship was at sea for over a month. Water levels started off at 46% saturation (approximately 55 ppm) saturation on the system and the PHoenix™ was able to reduce and hold the water below 22% saturation or approximately 26 ppm.

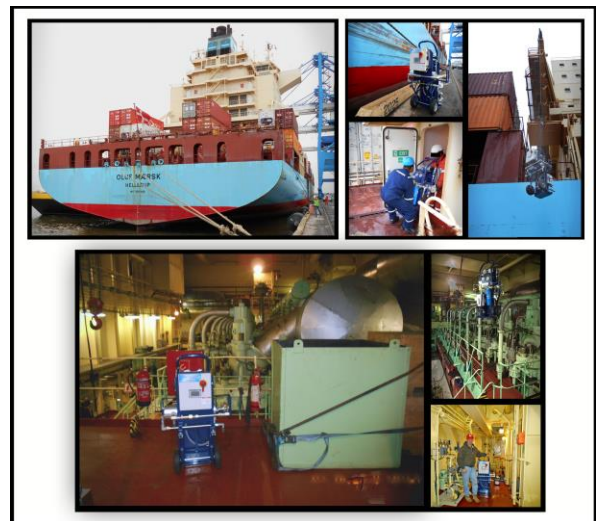


Figure 2: Stern Tube Phoenix C4