

# Technical Bulletin

## UCON Trident® AW hydraulic fluids and Neptune with sea water

Ucon Trident® AW Hydraulic Fluids and Neptune lubricants are recommended into marine and environmentally sensitive applications where superior lubrication is a requirement. To better understand the effects of sea water on this class of lubricants, the physical and lubrication properties have been investigated. The range of seawater contamination investigated was 0-4% ingress. See Figure 1.



Trident AW-32	Trident AW-32	Trident AW-32	Trident AW-32	Trident AW-32	Trident AW-32
	0.5% seawater	1.0% seawater	2.0% seawater	3.0% seawater	4.0% seawater

Figure 1: UCON Trident AW-32 with various amounts of sea water (Gulf of Mexico, Mobile Bay)

As 4% sea water ingress is approached, a cloudy suspension of salt is formed in Trident AW-32. The water is soluble in Trident, the salt is not. As a result, the salt will form particulate contamination that can be filtered out of the fluid.

Trident passes corrosion testing by ASTM D-665A. The synthetic seawater portion of the test is a fail because the salt crystals that are formed deposit on the steel pin. Seawater ingress would require filtration of the salt out of the hydraulic fluid.

The effects on viscosity, 4-ball wear scar diameter and the traction coefficient have been investigated with the addition of sea water. The recommendation is to maintain the level of sea water contamination below 7500 ppm during use of the hydraulic fluid. See figure 2, 3, 4.

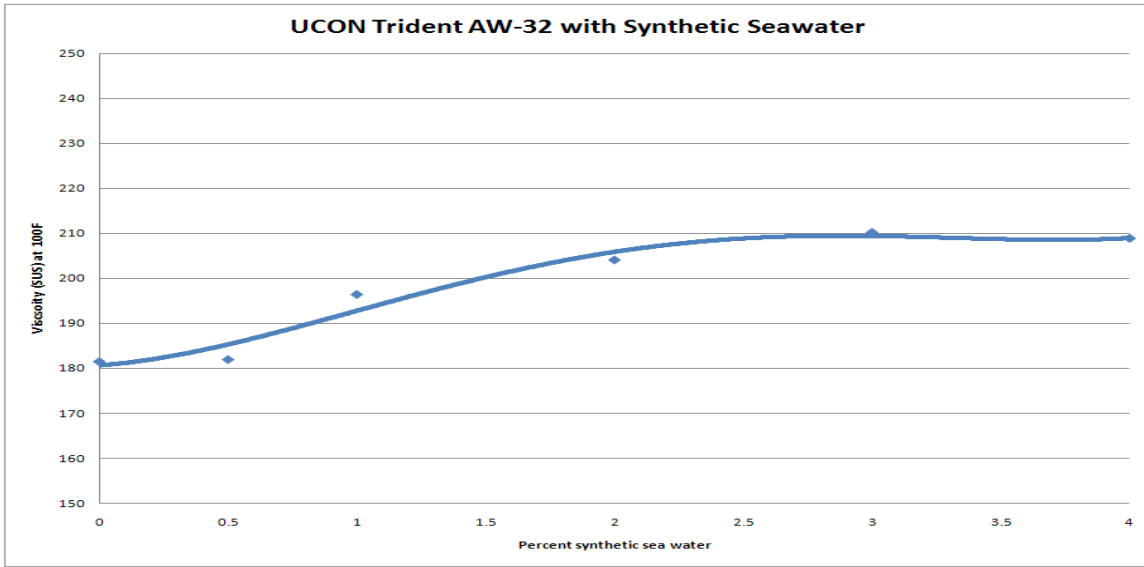


Figure 2: UCON Trident AW-32 with various amounts of sea water (Gulf of Mexico, Mobile Bay)

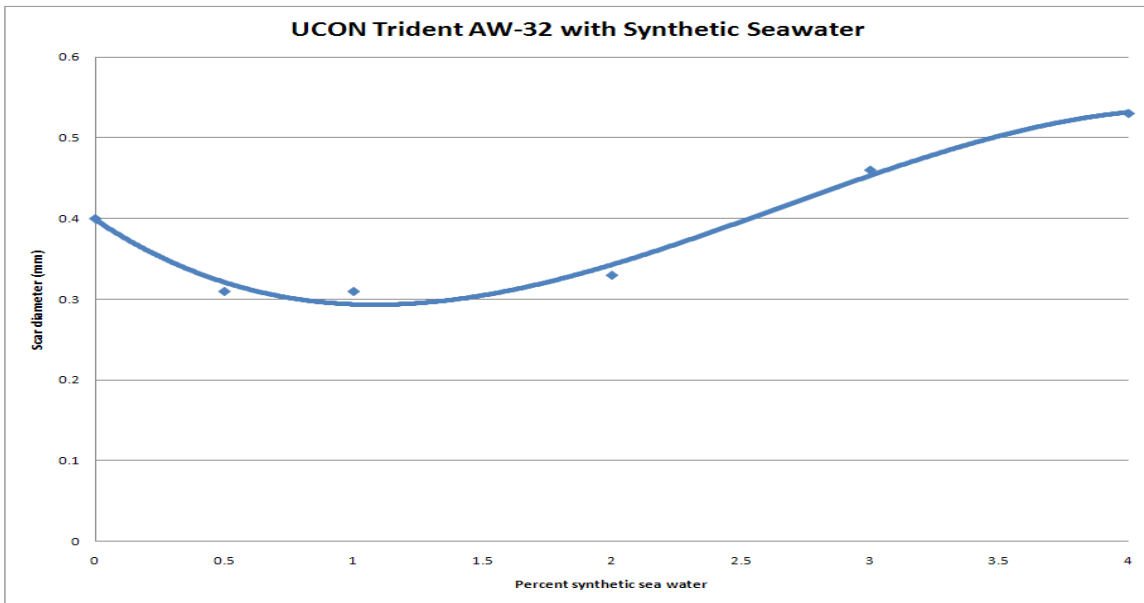


Figure 3: UCON Trident AW-32 ASTM D-4172 4 Ball wear with various amounts of synthetic sea water

Evaluation of the results by ASTM D-4172 and the MTM traction coefficients support the conclusion that UCON Trident and Neptune products can be contaminated with up to 1% sea water without any appreciable effect on the lubrication properties of the fluid.

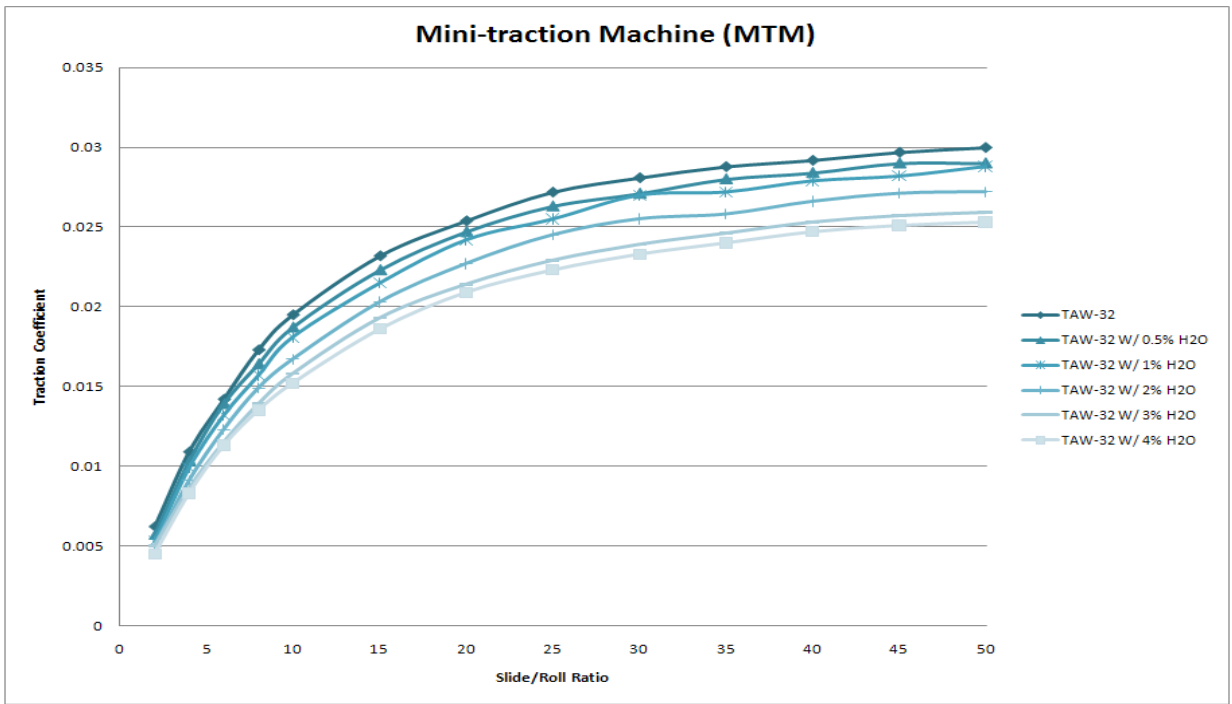


Figure 4: UCON Trident AW-32 Mini Traction machine (MTM) with various amounts of sea water (Gulf of Mexico, Mobile Bay)

The conductivity of Trident and Neptune lubricants does not increase appreciably with the addition of up to 2% sea water. See figure 5.

### Conductivity increase with Sea-water Contamination

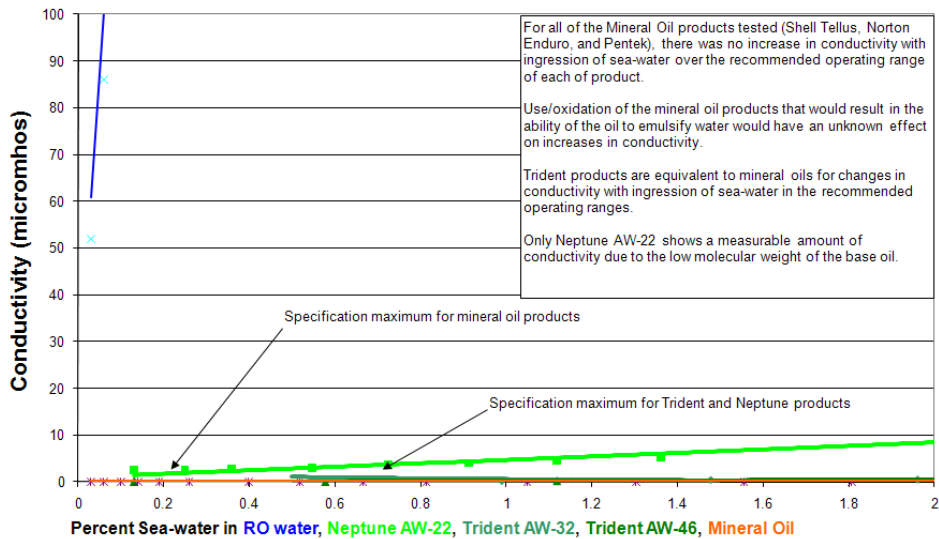


Figure 5: UCON Trident AW-32 conductivity with various amounts of sea water (Gulf of Mexico, Mobile Bay)