



Get on Board for Longer Lubricant Life

UCON™ WaterGuard Stabilizers Help to Improve Hydrolytic Stability of Esters for Enhanced Performance

At sea, the importance of machinery lubrication reliability cannot be overstated. UCON™ WaterGuard (WG) Stabilizers can extend the life of lubricants used in marine applications, including deck equipment, by improving the hydrolytic stability of a fluid formulated with esters.

With variants available for use in vegetable oils (natural esters or triglycerides) or synthetic esters, UCON™ WG Stabilizers do more than enable longer-lasting lubricants – they can also help to control deposit and varnish formation as the lubricant ages.

Made for a Life at Sea

Esters used in lubricants are prone to hydrolysis when exposed to moisture or water – a likely possibility on a ship – which can lead to acid generation and fluid degradation. UCON™ WG Stabilizers act like a sponge, soaking up the free water to render it less active and kinetically slowing down the rate of hydrolysis.

UCON™ WG Stabilizers also help meet legislation requiring that maritime lubricants be biodegradable, minimally toxic and not bio-accumulative.



WG-1: Versatility Expands Possibilities

The UCON™ WG-1 Stabilizer can be used with most natural and synthetic esters, including unsaturated and saturated esters. As shown in Figure 1, the UCON™ WG-1 Stabilizer significantly improves the hydrolytic stability of a polyol ester resulting in extended lubricant life.

The UCON™ WG-1 Stabilizer is readily biodegradable (OECD 301F) and is based on an ISO-32 viscosity grade. It is also accredited as a component for use in food-grade lubricants.⁽¹⁾ It features a high viscosity index and excellent low-temperature performance.

Figure 1: Hydrolytic stability improvement with UCON™ WG-1 Stabilizer^(3,4)

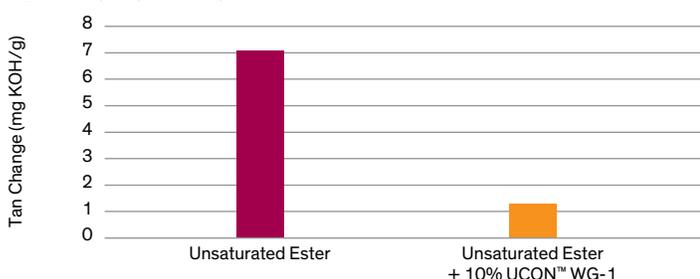


Table 1: Typical properties of UCON™ WG-1 Stabilizer⁽⁵⁾

Viscosity at 40°C, mm ² /s	32
Viscosity at 100°C, mm ² /s	6.5
Viscosity index	146
Pour point, °C	-57
Flash point (COC), °C	216

⁽¹⁾ UCON™ WG-1 Stabilizer complies with US FDA 21 CFR 178.3570 and is NSF certified for indirect food contact.

⁽²⁾ UCON™ WG-2 Stabilizer complies with US FDA 21 CFR 172.808(b)3, 173.340(a)(2)1, 175.105, 176.180(b)(2), 176.200(d)(3), 176.210(d)(3), 177.1200(c) and 177.1390(c)(2)(ii)2.

⁽³⁾ The graphic representations are presented here for illustrative purposes only and should not be construed as product specifications.

⁽⁴⁾ ASTM D2619 is modified by adding an amine-phosphate at 0.25 wt% to artificially accelerate aging and the experiment is conducted with 10 wt% water in place of 25 wt% water.

⁽⁵⁾ These are typical properties, not to be construed as specifications.

WG-2: Focus on Saturated Synthetic Esters

The UCON™ WG-2 Stabilizer is a tri-block copolymer and is intended for use primarily with saturated synthetic esters. As shown in Figure 2, when UCON™ WG-2 Stabilizer is added to a fully saturated trimethylolpropane (TMP) ester, even at quantities as low as 5 percent, hydrolytic stability improves. Polyol esters are inherently more resilient than vegetable oils, making the hydrolytic stability improvement smaller under these test conditions.

It is readily biodegradable (OECD 301F), approved for direct and indirect food additive use⁽²⁾ and features a high viscosity index.

Figure 2: Hydrolytic stability improvement of estolide (TMP) with UCON™ WG-2 Stabilizer⁽³⁾

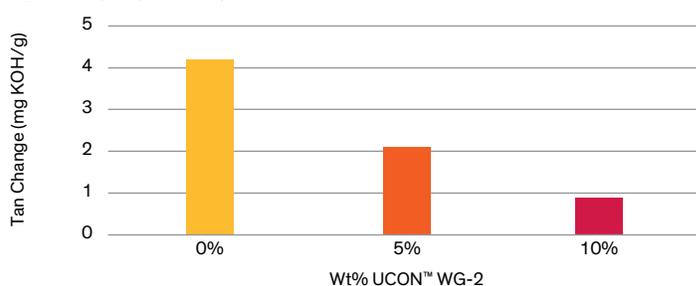


Table 2: Typical properties of UCON™ WG-2 Stabilizer⁽⁵⁾

Viscosity at 40°C, mm ² /s	215
Viscosity at 100°C, mm ² /s	30
Viscosity index	186
Pour point, °C	-5
Flash point (COC), °C	216

For more information on how UCON™ WaterGuard Stabilizers can enhance your lubricant's performance, contact your Dow representative or visit dow.com/lubricants.

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