

DOWSIL™ 9510 Petroleum Antifoam

Novel technology for foam control in crude oil



The evolution of oil production and oil-gas separation units requires distinct and unique additives. In addition to reducing foam and liquid carry-over problems, antifoams for three-phase separators need to be robust across systems with low cost and minimal impact on downstream operations.

The new foam control technology developed by Dow for use in crude oil leverages an innovative organo-modified polysiloxane actives and replaces the traditional organic solvent with water.

The new product, DOWSIL™ 9510 Petroleum Antifoam, shows similar or better results compared to conventional solvent-based additives. It can be applied in several types of crude oil, from low to high API grades, at the same use levels as the conventional technology (20 – 100 ppm).

Figure 1 shows the initial foam volume in samples of crude API 26° without additive, crudes containing 20 ppm of the traditional technology (PDMS in solvent), and DOWSIL™ 9510 Petroleum Antifoam. These lab evaluations were conducted with compressed aging cells in a roller oven.

Results using Atomic Absorption Spectrometry with different types of crude treated with 50 ppm of antifoam and then demulsified confirmed that DOWSIL™ 9510 Petroleum Antifoam reduces silicon carry-over in the oil. As the antifoam is water-based, the siloxane actives have a different partition coefficient compared to the traditional technology, reducing the residual silicon in the oil (**Figure 3**). However, it has no negative impact on the Total Oil and Greases content (TOG) in the residual separation water, according to the standard industry evaluation protocols (**Figure 2**).

To switch from the conventional solvent-based materials to the new water-based technology, no engineering modifications to the existing production facilities are required. The new product has a low viscosity (50 cSt) and microbiological and physical-chemical stabilities longer than six months.

Based on internal Life Cycle Assessment (cradle-to-gate), in agreement with the calculation method IPCC GWP 100a 2013, DOWSIL™ 9510 Petroleum Antifoam has an approximately 50% lower carbon footprint, in CO₂ eq, compared to its direct solvent-based offset. By replacing hydrocarbons with water, DOWSIL™ 9510 Petroleum Antifoam also reduces hazard concerns related to flammability and process safety.

Contact your Dow representative or visit www.dow.com to learn more about our products and request samples.

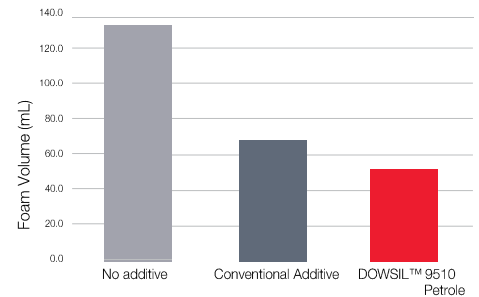


Figure 1 – Initial foam volume in 80 mL of crude API 26°

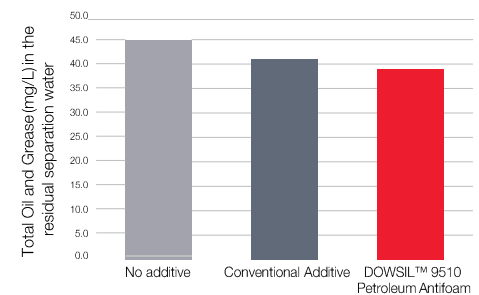


Figure 2 – Total Oil and Grease (TOG) in the residual separation water of crudes with different antifoam treatments

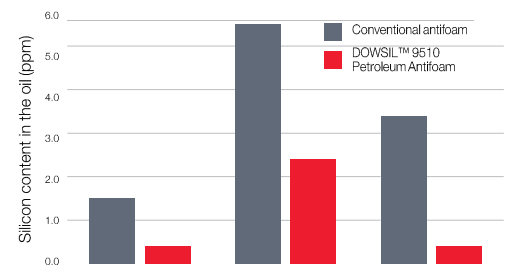


Figure 3 – Silicon content in different crude oils after antifoam treatment followed by demulsification