

Tank Mixers Control BS&W in Crude Oil Storage Tanks



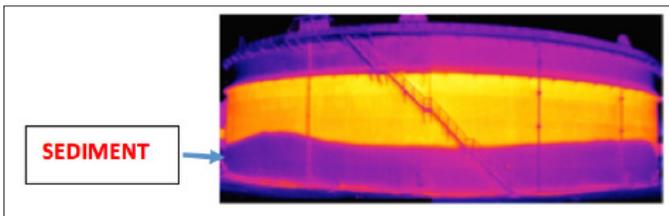
Various qualities of Crude Oil are available around the world. New “unconventional” crude tends to have a lower quality compared to conventional WTI (West Texas Intermediate) for example.

Poor quality crude oil contains a significant share of impurities, such as tar, coke, sand, water, and/or seawater. These impurities tend to settle, and water accumulates in pockets. This phenomenon is commonly called BS&W: Bottom Sludge and Water. Accumulation of impurities and water could seriously damage the tank.

To avoid that, major cleaning operations must be conducted during decadal overhaul. If the sediment and accumulation is important, the tank cleaning is complex and costly.

Corrosion due to seawater or sediment accumulation could even create a tank rupture and spill oil. Furthermore, when pumped out, the impurities accumulated on the bottom of the tank will run through and damage all transfer equipment such as pumps, valves, and instrumentation. Last but not least, the accumulation of sludge on the bottom of the tank reduces available operating volume of the tank.

Adding to this is the necessity to mix different qualities of crude oil before refining to maintain a proportion of petroleum products that meet the needs of the refinery installations.



Agitation of stored oil is essential to avoid these drawbacks, which can turn out to be excessively expensive, and only continuous mixing can prevent settlement and water accumulation.

There is no possibility of mounting an agitator supporting structure on large diameter storage tanks with floating roofs, preventing the installation of top entry mixers.

In that situation, the installation of Side Entry mixers directly in the tank shell nozzles happens to be the best option. Several side entry mixers can be installed on the same tank, to cover storage tanks up to 120m diameter. These mixers must be installed on the same quarter of the tank, allowing the flows to combine in a powerful flow that can cross the tank diameter.

However, shell nozzles on existing tanks may be a constraint to the installation of Side Entry Mixers. The size of the nozzle may not allow the introduction of a large propeller and site conditions may lead to complicated overhauls.

Milton Roy Mixing has developed and manufactures a compact and powerful side entry mixer, fitted with a high efficiency SABRE propeller which lifts these constraints. It can be mounted to practically any tank nozzle.



Swivel type mixers allow the mixer flow to cover the complete tank bottom with minimum power consumption. The mixer is selected to produce a flow that can reach the opposite side of the tank. By changing the angle monthly, the flow can be positioned to control BS&W in different sectors of the tank bottom. Planning a monthly angle change sequence allows you to avoid all deposits.

Newer mixers are designed to swivel easily in a few seconds. An operator alone can change the flow angle while inspecting the tank farm. Even though the equipment is articulated, the robust design maintains the lowest vibration level, to prevent any impact on the tank shell.

