
Question 31: How does emulsion breaker performance compare when injected in the crude or wash water? What is your method to inject emulsion breaker for 2 stage desalters?

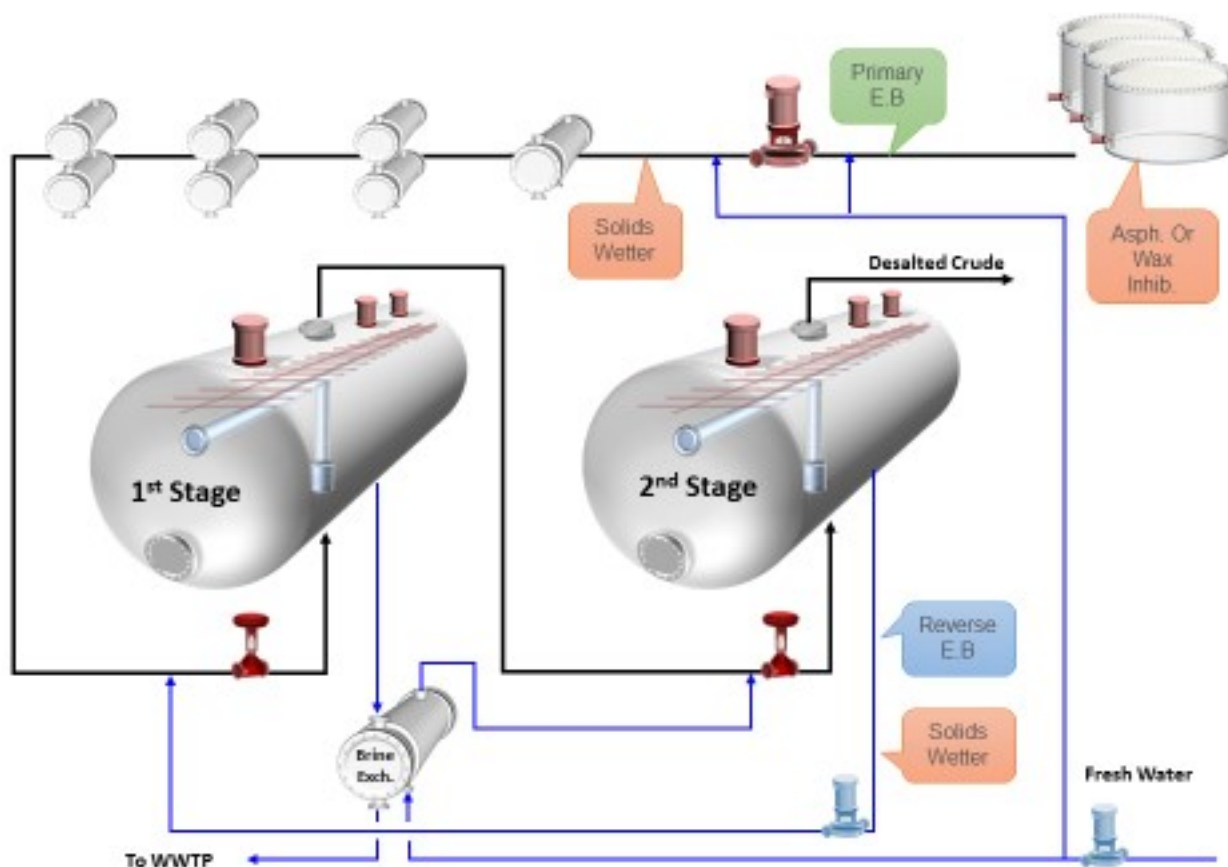
BILL CATES (Hunt Refining)

In discussing this issue with multiple chemical vendors, it seems that the universal answer is it depends.

For the desalter system as a whole, the typical emulsion breaker is injected into the crude stream as far upstream as possible in order to provide intimate contact. In this case, the emulsion breaker is one that has a hydrocarbon solvent and so is hydrophilic which wants to stay in the oil phase. There are cases where injecting this emulsion breaker into the water phase can help reduce the impact of surfactants that surround the water droplets.

There is new chemical technology that is on the market where the solvent package is more compatible with the water phase. These new products offer a comparable, if not superior, performance to the hydrocarbon solvent-based products. As discussed in the previous question, this will require that wash water be injected around the crude charge pump.

The drawing below provides a pictorial representation of this system.



When using a two stage desalter system, the usual system is to treat the crude upstream of the first stage. If there is an excursion in the first stage that affects the second stage, an injection point to treat the second stage can be utilized. This is typically a reverse emulsion breaker injected into the wash water going to the second stage desalter.

SAM LORDO (Consultant)

The functionality of the desalting aid with respect to its effectiveness when it is injected into the crude or wash water can depend on what the solvent package is in the desalting aid. If you are using a hydrocarbon solvent based desalting aid injected into the wash water, the performance I have seen is like that when it is injected into the crude. Some newer products are formulated with a solvent package that is more water compatible and in this case the performance is very comparable, if not superior, to the hydrocarbon solvent-based products injected into the crude.

When injecting desalting aids in a multistage system, it is preferable to have multiple injection points, one into each stage. But in most cases the desalting aid is added to the first stage only. In the event of emulsion carryover from 1st stage to 2nd stage, or 2nd stage oil under carry, then a secondary injection point is used.

Injection of emulsion breaker into the wash water or crude feed or both have certain merits. The mechanism of the behavior of the emulsion breakers changes based on how it is implemented. Successes with emulsion breakers into the oil phase have long been documented in the industry as have the application into the water phase. There have been multiple recent successes of utilizing emulsion breakers in both crude and water injections that have demonstrated performance beyond the individual applications; however, each system is unique and needs to be evaluated for the appropriate program.

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