

ECO Demulsifiers for Centrifuging Oily Sludge

1. Are there pH ranges the particular demulsifiers work best in?

The first step in oil (or oily sludge) demulsification is **NOT** to adjust pH. As you know, pH is a function of water H⁺. Oil has no pH, and in the vast majority of cases, you do not have to add acid or caustic to an oil emulsion. There is, therefore, no recommended pH in working with oils. It would be much safer to ignore such a thing as pH at this time.

2. Should the demulsifier be added at the liquefaction temperature or at ambient?

There are general, and very important, steps in screening demulsifiers. In most cases, heat first (to reduce viscosity) then mix in the ECO* demulsifier. So, yes, add after liquefaction.

3. High shear is known to create an emulsion; is there a limit to the speed of the mixer? How long should I mix?

As for mixing, please remember that the test procedure should duplicate to the extent possible the available parameters in the real world. (After 37 years of emulsion breaking, we believe adding ECO to the oil in a beaker with a magnet-stirrer does not duplicate real conditions) A glass bottle with a screw cap is much better. Shake by hand, end-over-end 25-100 times, depending on the expected mixing in the real system. For centrifuge applications, where a "conditioning tank" is used, mix 100 times, then set down and monitor. Performing "bottle tests" as described also enables you to run several tests at the same time; evaluating different ECO's and/or different dosages.

3. Concerning the demulsifier itself, what range of dilution (if any) is recommended?

DO NOT pre-dilute any ECO's; they're to be used as is. If in the rare cases, where due to pump capacity or lab test volumes dilution is necessary, DO NOT use water. ECO's are solvent-based, and will gunk if you add water. Use a mixture of xylene and IPA in the lab, and kerosene/naphtha in plant application.

4. What are the ways to reproducibly quantify how well the demulsifier is working?

You can qualitatively observe test samples for early signs of demulsification. There may be a color change, usually to black, and a loss of viscosity as you release free water. These changes usually occur within 2-10 minutes, depending on anticipated contact time in the field, followed by centrifugation. At this point, spin at a speed and for a duration that duplicate field machines.

After the spin, read solids (look for oiliness), water (look for color and presence of fines) and the oil layer (look for any interface, and then sample the oil to test for water and solids).

5. Are there coagulants or polymers to avoid – i.e. compatibility issues with the demulsifier?

Most centrifuge jobs in the field require a small amount of a cationic polymer, added immediately before the machine, and only after the ECO has de-oiled the solids, and made them water-wet. Thus, a very small amount of polymer is required, and you avoid creating "slimy" solids. Many brands of cationic polymer have been used after ECO action, and we are not aware of any incompatibilities.

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