

MSR Recommended Jar Test Procedure for Determining Separability

MSR receives requests for a test procedure to determine whether or not an oil water separator will be satisfactory for removing oil from the customers water stream. The test procedure below is a relatively simple and inexpensive means of determining whether or not the mixture can be separated easily.

Please note that if the test is successful, that gives a very good indication that an oil water separator would work well. If the test is not so successful, however, that doesn't mean necessarily that an oil water separator will not work, it just means that we need to do a little more engineering to ensure that it will operate satisfactorily.

The test should be done as close as possible to the place where the samples are taken and within a relatively short amount of time to avoid possible bacterial action. Please note that there are numerous ways to get non-representative samples and only a few to get good ones, so please refer to our sampling procedure also provided on the website.

The recommended procedure is:

1. Take about three reasonably full liter or quart samples of the water / oil mix in clear glass bottles. For the quart bottles MSR uses for samples, reasonably full would be 5 inches of liquid. Don't try to pour liquid in or out to get the exact height, just fill it and measure as below.
2. Take a photo of the samples, backlit if possible so that we can see what the mixture looks like.
3. Make notes on the appearance too i.e. milky, small droplets, large drops, or whatever you see. Mention solids if they are present.
4. Allow sample 1 to settle naturally on a desk or table or in a temperature controlled bath if you have one without disturbing it, measuring the water height within the bottle (an estimate based on a ruler on the outside is fine, be sure to deduct the thickness of the bottom)
5. Keep track of the amount of time it takes to clear and take photos periodically (about every half hour), noting the time elapsed. When you take the photos, try to do so with the ruler beside the bottle so we will have the height measurements.
6. Make notes on the state of the mixture for each time you take a photo.
7. With luck, it will clear or mostly clear in about 2.5 - 3 hours.
8. Estimate the thickness of the oil layer at the top if there is enough to measure.



For sample no 2, shake vigorously for one minute and repeat the steps above.

For sample no 3, check the water temperature and pH at the same time as the start of samples 1 and 2, then let it settle like sample 1 as a further check.

At the end of the test – probably end of the day unless they clear earlier – check the temperature of all three samples. Try to do your testing somewhere the ambient temperature is not unreasonably hot or cold. If your lab has a temperature adjustable water bath, try to use that and set it at the temperature of the water to be treated. This is ideal if you can do it.

It would probably be best to start the procedure early in the morning so you can have all day if necessary for the samples to clear.

With the photos and time information, we can get a feel for the separability and also the average droplet size, which helps in the design of systems.