



Industrial Water Management Technologies, Services and Solutions:

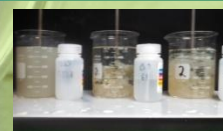
The Basics of Jar Testing

Jar testing is a method for determining the proper dose rates of chemicals utilized when treating wastewater. It is a miniature batch treatment tank with all the variables under control of the operator. It usually consists of a “jar” or beaker of a known volume and a variable speed mixer. The mixer can be as simple as a glass rod stirred by hand, a laboratory stir plate with a magnetic stir bar or a motor driven metal impeller, similar to the mixers found in many waste water treatment reaction tanks. It is also a good idea to have a pH meter as many of the reactions that occur during treatment require specific pH ranges.

As with any experimentation keep good notes on additions and observations this is how to learn.

Water from the equalization tank (a tank where all wastewaters are intermingled before being pumped off to the wastewater treatment system) is measured out to a specific volume, usually a liter. The jar is then agitated and the pH is measured. In waters that may contain cleaner as well as dissolved metals it is common to lower the pH to 2.5 – 3.0 with dilute sulfuric acid if it isn't already at the required pH. Once the pH is lowered the chemical additions are commenced. Most often it is coagulant added at this stage. It is measured in ppm (parts per million). A ppm is one milligram of something in one liter of water. In this case one ppm is a one hundredth of a milliliter in one liter of water, with 1 milliliter in 1 liter of water equaling one thousand ppm. Coagulant addition may range from 1 to several thousand ppm depending on what is being treated. The coagulant is then allowed to mix in.

Then the pH is raised with dilute sodium hydroxide, most often to a range of 9.0 – 10.0. If required, because of complexors that might be present in the water tying up the metals, a metal precipitant is added at a dose of 50 – 200 ppm. When metal precipitant is mixed well the polymer is then added. In water being treated for metals an anionic polymer is commonly used. Polymer addition should be made with good mixing to evenly distribute the polymer throughout the water. Mix for 30 to 60 seconds. Then turn off the mixer. A heavy precipitate or floc should have formed and begins to settle to the bottom of the jar.





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The Basics of Jar Testing (cont')

A sample is decanted and filtered for analysis. Compare the results to your discharge limits. If they are good treat your water with the same procedure that gave you a successful jar test. If results don't meet your limits try increasing dose rates of the coagulant first, then the metal precipitant. Very small after metal precipitant dosing usually means you've added too much. If none of these additions work it may mean there is something new introduced into your waste stream that may require a different chemical treatment program than the one being used – this may include different chemicals, addition rates, pHs and orders of addition. At this point it might be necessary to consult a supplier (ChemAlliance©) for jar testing. We will provide on-site jar testing to resolve the issue and not just tell you to send a sample. If you opt to send a sample in USA you should be able to ship it legally by United Parcel Service as a non hazardous item if it is marked as Water for Testing. Make sure sample is in a DOT specified leak proof container. You should only have to pay standard shipping charges.

