

# Polymer Flocculant Preparation for Jar Testing

## Liquid

Liquid emulsion polymers are easily prepared by dilution with water. We generally make up liquid polymers at 0.1% stock solution. Start by shaking the bottle of concentrated (or neat) polymer to ensure it is well mixed with the carrier. After shaking use a graduated 1 ml syringe and up-plunge the polymer to be used. Make sure you read the graduations as you will be adding very little to the water. Also, once you have pulled material up into the syringe wipe off the tip as to not include the material outside of the syringe in your calculations. Have a 250 ml to 500 ml beaker of water, with a stir bar mixing on high, ready for the polymer addition. While the water is being mixed on high, plunge 0.25 ml liquid polymer (for a 250 ml diluted sample) into the vortex generated by the mixing water. If you are making up 500 mls add 0.5 ml of the neat polymer. Allow to mix for 1 minute then turn off the mixer. This diluted polymer must age for 30 minutes to allow for maximum effectiveness. The diluted polymer should have the appearance of snot. This should be labeled as 0.1% stock solution. 1 ml of this polymer = 1 ppm in a jar test using 1,000 mls of waste water. Generally, we add 5-10 ml for good flocculation in the final step of jar testing. Cationic polymers usually require higher dosing to achieve similar clarity than anionic polymers.

## Powders

Powered polymers require longer mixing and accurate weighing out for making up a stock solution. Once again measure out accurately 0.25 gms of powdered polymer (for 250 ml stock sample) or 0.5 gms of a 500 ml stock solution. Have your water measured out in a beaker mixing on high with a good stir bar. It helps dissolve the powder if you use warm water. Use 250 ml or 500ml of warm water. With the mixer on high, sprinkle in the powder over the top and make sure it goes in grain by grain into the vortex for best make up. A clump will take longer to dissolve. This powder will swell up and have the appearance of tapioca (or what we call the fisheye stage). The powder will pass through this stage and dissolve completely. It should take 30 minutes to completely dissolve. When using cold water, it may take longer. When the powder is completely dissolved put into a



bottle and label with the product name and dilution factor; IE: Aquapure AS Plus 0.1% stock solution. It is also a good idea to put the date on the bottle as cationic polymers only hold a charge for a couple of days and anionics go for several weeks.

**Notes on polymer handling:**

1. If your samples have been frozen they may not work, so do not leave them in the car in the winter. Bring them inside, protected in a box.
2. Polymers are very concentrated and sticky/snotty. Do not be sloppy with these polymers. If you spill the concentrated or diluted polymers wipe them up with a DRY paper towel. If you spill the powder dust into a trash can. If water gets on the powder on the floor, the floor will become slippery and unsafe.
3. NEVER add concentrated (neat) polymer to a jar test of wastewater. Always add diluted polymers.
4. Never use a blender to “make down” or dilute the polymer. This type of mixing will shear the polymer making it ineffective. 5) Allow your diluted polymers to sit for 30 minutes without mixing to give the polymer a chance to age.

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