



## **Polymer make-down systems made easy.**

Furrow Pump would like to offer some guidance on how to choose a polymer make-down system based on cost, maintenance and effective hydration of the concentrated polymer.

Properly activated polymer once injected into a wastewater stream is an excellent way to remove fine particles that would otherwise slip right through the treatment system. Polymer strands (known as chains) provide a sticky surface to gather up ultrafine particles so they either settle out in a clarifier or float out in a dissolved air floatation system (DAF).

### **Polymer**

Think of emulsion polymer as a barrel of long stringy microscopic spider webbing. It's so thin you could pack 10,000 miles of it inside the barrel. The webbing strands are both sticky and slippery (via a slight magnetic charge) and want to adhere to everything, including themselves. Not a very useful item if you can't control it, right? We have to control it.

By the manufacturer adding a water-soluble oil to the barrel, the oil provides a buffer between the sticky and slippery strands of our spider webbing. It calms down the stickiness while the polymer waits to be put to work.

### **Putting Polymer to work**

Polymer will arrive at your door in a container of concentrated or "neat emulsion". The white milky liquid is actually billions of hairs suspended in water soluble oil. Trying to use neat polymer right out of the drum is like throwing a clump of tightly braided hair into a stream of dirty water: The dirt adheres to the outside of the hair braid and the inside remains clean and unused. To get the most cost benefit out of polymer, the water soluble oil must be stripped off and the hairs (technically called "the chain") must be encouraged to spread out (technically called "unfolding"). Without an efficient make-down system (known as "hydration"), polymer, like our hair braid, is expensive because only the outside edge of the clump is actually working for you. The rest goes down the drain unused.

### **Hydrating Polymer**

Furrow Pump offers a system called the MixMate Poly Make-down System. When the volume of polymer has been predetermined (usually by a "jar test" using a sample of the waste water), Furrow Pump can recommend the correct MixMate to hydrate your neat emulsion polymer into an effective made-down solution.

To hydrate neat polymer, you have to do Work. The MixMate utilizes the Work inherent in city water (Velocity under Pressure) to basically “force” water in between the millions of polymer chains looking for a place to unfold. Once unfolded, the chains move through the MixMate with the city water to a blending station where additional water is added to create the exact polymer concentration needed for the application. This concentration is typically a 1% solution and could be as low as 0.2% solution, depending on the results of the jar testing.

## **How Does the MixMate Work?**

The MixMate has an inlet that allows a predetermined amount of clean, pressurized water (typically city water) to flow through an adjustable flowmeter. The water is then forced through a high velocity eductor where the outlet is aimed directly at a specialized valve opening unique to the MixMate. When the high velocity water (targeted between 10 and 20 feet per second) flows across the specialized valve, the neat polymer is introduced in another unique way: Think of a pizza sliding under a door with a firehose waiting on the other side. The pizza dough would be nearly atomized as it slid under the door. In the presence of the high velocity water stream, the neat polymer experiences the same process of hydration. The oil is stripped away and the polymer chain unfolds. This process instantly creates a 1% by-volume polymer solution. That 1% polymer solution moves down the MixMate piping to a blending section where additional water is added to create the solution percentage comparable to the jar testing: Typically 0.5% but units are available to make-down as low as 0.2%.

## **No Moving Mechanical Parts**

By using highly precise high pressure water to hydrate polymer across a unique valve structure and then blend it together in a motionless blender with no moving parts, the MixMate avoids moving parts, electricity, motors and paddles and floor space. The entire device mounts to a wall and takes up 3 square feet of wall space for the MixMates less than 20 gpm and 9 square feet of wall space for the MixMates above 20 gpm.

## **Auto-Flush Control**

MixMates come with an automatic start-up sequencing control box. Pressing the Start button provides power to open the solenoid valve and water flow through the MixMate. After 20 seconds of flush time, the controller sends power to the polymer metering pump and the hydration process begins. When the operator wishes to shut down the polymer hydration process, the Stop button takes power away from the polymer pump first and the MixMate flushes itself out for 20 seconds before power is removed from the solenoid valve and the unit is shut down.

## **Unique Approach of the MixMate**

- No moving mechanical parts to hydrate polymer

- Automatically flushes itself out before and after polymer hydration
- Full design support team ready to help choose a unit for your needs
- Units available from stock to about two weeks