

Centrifugal pump for stock tank mixing

The centrifugal pump that was tested in the fall of 2013 had an efficiency of about 4% in converting angular velocity into pump head. This was likely due to the fact that the drag on the rotating arm is high and that a significant amount of the energy input by the operator is going directly to rotating the entire tank of fluid. Rotation of the entire tank of fluid causes the surface of the fluid to be a parabola that directly reduces the ability of the rotating arm to provide lift. Thus pumping efficiency can be improved by...

- reducing the drag on the rotating arm by creating a streamlined profile.
- adding baffles to reduce rotation of the tank of fluid
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We could also explore completely new approaches to the problem of mixing chemicals. One option would be to have the water supply for the stock tanks be injected into the bottom of the tank with a high velocity. This jet will entrain the dense coagulant solution in the less dense water and thus provide some mixing without requiring any operator input.