Flocculation System

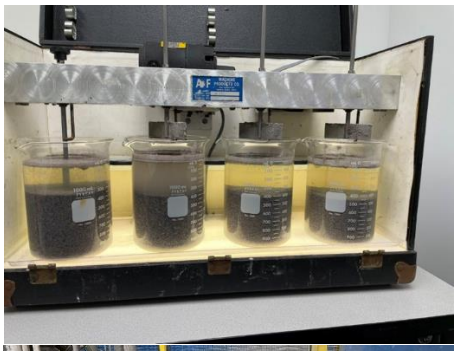
Problem: A customer was experiencing highly inconsistent quality of the slurry that is used to form their product. The slurry contains a polymer solution that is used as a flocculant to achieve the desired level of coagulation and consistency. This polymer is mixed with water and delivered to the process through a "flocculation system." Because of the inconsistent results, the operator was spending too much time adjusting the flocculation system, resulting in decreased production. The customer consulted with PTS to examine their existing system and make recommendations for improvements that would ultimately increase the consistency of the quality of their product.

Solution:

With our broad experience in numerous manufacturing industries, we were able to quickly identify that the customer's existing flocculation system was over-mixing the polymer material with water. The polymer is most effective immediately after gently being mixed with water. If the mix is too aggressive, or the material is mixed for too long, the polymer chains begin to break down and become less effective. The customer's process involved recirculating a holding tank of the polymer-water mixture indefinitely until the material was needed by the process.

After consulting with the manufacturer of the polymer material and other industry experts, our suspicions were confirmed. The longer that the customer's flocculant mixed in the recirculation tank, the more ineffective it became, resulting in highly inconsistent slurry quality. Our recommendation was to replace the existing system with a new polymer make-down system, which would gently mix the polymer with water immediately prior to the point of use. We researched various options and recommended a system to the customer.

The next step was to perform preliminary testing to prove that the new system would achieve the desired results. To do this, we first performed a bench test, where we manually mixed polymer with the customer's slurry to identify the optimal ratio of polymer to water. We then built and set up a test cart, where we delivered polymer from a bucket to our recommended system, which injected the polymer into a mixer with water and used the city water pressure to immediately deliver the flocculant to the process after mixing. The test setup was allowed to deliver flocculant to the process for an entire shift, and samples were taken every 20 minutes. The quality of the slurry immediately stabilized and remained consistent for the duration of testing, proving that our concept would work.



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The customer then went ahead and purchased the recommended polymer make-down systems. PTS designed, fabricated, and programmed a pre-assembled control panel with a PLC and HMI to communicate between the process equipment and the new system. PTS also provided electrical, P&ID, and structural support drawings for the customer to use for installation.

Once the system was installed, the customer immediately noticed that their quality issues had disappeared. The new flocculation system was delivering a consistent, controlled dose with a proper amount of mixing to maintain a consistent slurry, solving the original problem. As an added bonus, they also noticed that they were using less polymer material to achieve the same result, and they were spending less time making adjustments, resulting in a significant increase in productivity with the new system! If you have a problem that you're not sure how to solve, odds are that PTS has encountered it and can help you discover, test, and design a solution to optimize your process.

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