

NYSP21 Assists Sydor Optics with Improvements to Wastewater Management in Lens Machining Operations



Challenge

Sydor Optics wanted to reduce solids and metal contaminants in process wastewater discharged from CNC and grinding lens machining operations.

Solution

NYSP21 evaluated source reduction and wastewater management options of Sydor's grinding operations, and conducted recycling and filtration tests, leading to reduced coolant use and pollutant discharge in the wastewater.

Results

Using a baffled tank to separate solids in the grinding operation extended the coolant life from 2-3 days to 2-3 weeks, reducing coolant purchase costs by over 50%—representing thousands of dollars of annual savings. NYSP21 provided Sydor Optics with different potential centrifuge design options to manage resulting wastewater and reduce discharge loadings.

Sydor Optics

Founded in 1964, Sydor Optics (Sydor) is based in Rochester, NY and is a leading manufacturer of custom flat optics for a variety of industries. Sydor combines expertise and attention to detail to produce high-precision optics using the latest optical fabrication technologies. Various mechanical operations, including CNC lathing, grinding, and polishing, are used to produce optical lenses.

Challenge

Sydor has been increasing production steadily over recent years, which has caused pollutant loadings in the wastewater, including total suspended solids and heavy metals, to increase over time.

"This was our third project working with Dr. Park and the rest of the NYSP21 team. Our previous projects were very successful so when it came to investigating the best methods for managing the coolants used in our business, it made sense to engage with the group at NYSP21. The team is very knowledgeable and easy to work with. We will continue to consider NYSP21 for any projects where their expertise will help us reach the environmental goals of our organization." **Zachary Hobbs, Sydor Optics, Inc.**

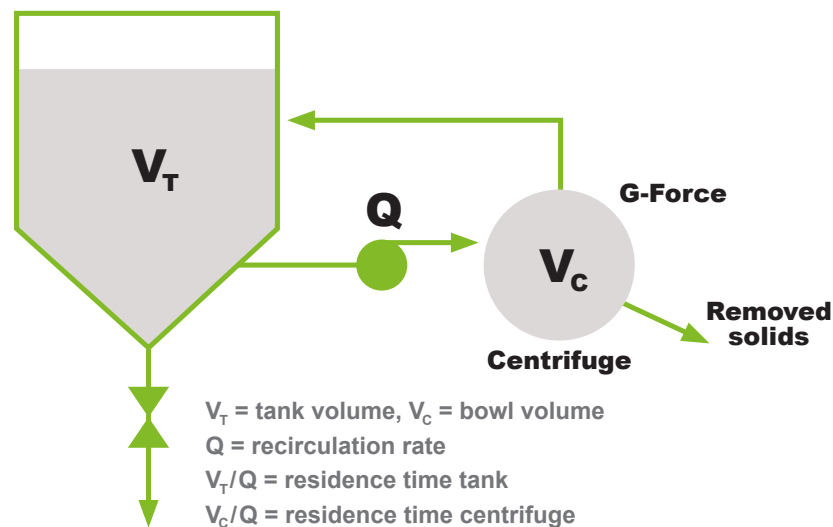
Sydor requested assistance from the New York State Pollution Prevention Institute (NYSP2I) to identify and analyze options to reduce the suspended solids and heavy metals in the process wastewater generated from their CNC and grinding operations.

Solutions

NYSP2I performed a baseline analysis to determine amounts and characteristics of the wastewater from the CNC and grinding operations. Sydor provided volume estimates for each operation, and NYSP2I collected samples from each operation for analysis. Source reduction methods were evaluated to reduce wastewater discharge and coolant use. Various separation schemes were considered and tested to manage the resulting wastewater. Tests were conducted offsite at Rochester Institute of Technology (RIT) as well as onsite at Sydor.

Results

Because the contribution of the CNC wastewater to the overall wastewater profile was much smaller than that from grinding (25 gal/day vs. 250 gal/day, respectively, with much lower solids and metal content in the CNC wastewater), recommendations focused on the grinding operation. Baffled settling tanks used to separate solids in the grinding machines increased time between coolant change-outs from two times per week to once every 2-3 weeks, thereby extending the lifetime of the coolant and decreasing coolant purchases by over 50%. This operational change represents thousands of dollars of potential annual savings for Sydor. Through various centrifuge tests, it was determined that the remaining process wastewater, consisting primarily of washwaters with now lower amounts of spent coolant, can be processed through a high speed centrifuge to significantly reduce solids and metals. Various system designs were provided based on centrifuge tank size and processing times. From the work performed as part of this project, it is estimated that pollutant loadings and surcharges could drop by 50% due to the reduction in solids and metals in the process wastewater.



Centrifuge system design to separate solids

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