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Evaluate Potential Problems Before Modifying Precleaning Processes

Soiled parts cause increased costs in processing and disposal. All water-based cleaning processes rely on detergent additives to function properly. Detergents vary from simple soaps, to sophisticated combinations of alkaline or acid salts and organic solvents. All produce the same end result: They work to remove oils and other soils, and are depleted regularly in the process of performing the job.

Soil Causes Process Problems

Most of these detergent systems are selective. They don't know the difference between fresh soils that appear on virgin parts or the old soils that reside in tanks after the cleaning process has been completed. Solid particles, such as metal fines and shop dust (and even humidity fluids) can be hydrophilic, or have a strong affinity for water. They literally drag oily particles with them to the bottom of the tank, making removal very tough, unless suitable agitation is installed. Agitation without filtration, however, can cause deposits of soils on parts as they come from the cleaning stage. In most cases, filtration without agitation will build up contamination in the tank and settle as sludge in the bottom. The sludge can contain additional soils, such as metals from the parts or contaminants from the water supply. Soil build-up in the cleaning solution typically consumes a very large portion of the new chemicals being added as makeup. It causes chemicals to be dumped prematurely, and allows redeposition of soils on parts that cannot be rinsed sufficiently in the next stage.

Correcting the Problem

The problem can be fixed: The surface of the tank solution can be skimmed regularly when the temperature is at or below 100 °F, or a coalescing system can be installed to remove the oils from the solution. The latter is two to three times more effective for removing soils, but more expensive.

Positioning a skimmer wheel or belt requires a location where floating oils collect with a minimum agitation on the surface. Filtering bags and membranes, which have at least a 50-micron capability to help reduce costs, must be installed. The return flow from the filters scours or agitates the bottom of the tank. This helps keep the soils suspended and increases the removal rate.

Install a soil/oil monitoring program that will require some lab testing to support in-house evaluations. An efficient, routine program will allow the oil and soil content to be tracked for establishing a more realistic dumping program, providing longer solution life and helping to prevent other problems caused by poor cleaning techniques.

An oil-splitting cleaner or additive can be very effective in removing soils. Do not use it, however, until some selective testing and evaluation have been completed to ensure that it will improve the quality of cleaning, and extend the life cycle of the solution. These cleaners usually contain detergent systems that remove soils and float most of the oils to the surface of the tank for easy removal. When used with a skimmer, filter set-up, and ozonation, this method will cut costs because of fewer dumping cycles, lower chemical expenses, and a reduced amount of rejects (because of processing cleaner parts).

Anticipate Problems

In my experience, it is best to question, evaluate, inspect and eliminate as many potential problems as possible before modifying a process. Each phase must be planned and executed carefully to ensure that it results in improvement.

My father's favorite saying was: "When you know it all, that's all you know." I now realize that no one knows it all, but all of us must know when to look for more knowledge and experience. *P&SF*