

Managing Solids with Sidestream Filters

SIDESTREAM FILTRATION SYSTEMS ARE AN EFFECTIVE TOOL FOR REMOVING SOLIDS FROM COOLING TOWERS

Have you ever wondered why your cooling tower basin fills up with solids so soon after the system has been cleaned? The problem is that the air around the tower isn't very clean. It's filled with all types of airborne particles – bacteria, pollen, vehicle emission fumes, factory and restaurant exhaust, dust from construction sites – as well as larger items, like flying insects and blowing leaves. Cooling towers act like air filters for these items, trapping them in the water stream as the air circulates through the tower. The air that comes out of the cooling tower is significantly cleaner than the air that went in, which might be good for the local environment but spells trouble for the long-term operation of the tower.

Once inside the tower, these particles have the potential to cause some serious damage. Heavier particles accumulate in the low points in the system, forming a layer of debris that restricts water flow and allows corrosion to occur on the metal that it covers. Lighter particles of organic material attach themselves to exposed metal surfaces, forming small brown nodules that corrode the surface beneath them. Gasses like carbon dioxide and oxygen dissolve in the water, providing the building blocks for scaling and promoting corrosive reactions. Worse, waterborne solids and nutrients provide a breeding ground for algae and microbiological pathogens such as *Legionellosis*, which can lead to major health issues.

Over time, corrosion and scaling can cause severe damage to a cooling tower. Scaling and particle accumulation can block the flow of water through the system. Corrosion can damage metal surfaces and cause leaks. And biological pathogens can escape into the air, causing illness and even death.

The longer these problems go unchecked, the harder and more expensive they'll be to fix. Chemicals such as inhibitors, dispersants and biocides can help slow the damage, and the best way to reduce the risks is to remove solids from the water as quickly as possible.

USES AND BENEFITS OF SIDESTREAM FILTERS

Basin sweepers and sidestream filtration provide a cost-effective solution for reducing solid particles from the cooling tower basin and piping distribution. As the name suggests, sidestream filters are separate units where a portion of the tower flow is routed to the unit for cleaning, which creates the "side stream." This flow is typically in the range of 5-10% of the total volume. According to the Association of Water Technologies, the best practice is to route water to the unit from the tower output sump, pass it through the unit's internal filter, and then return it to the base of the tower. Water is returned to the tower using sweeper jets which force the water back into the tower. The jet action has the added benefit of forcing the water to circulate, which helps to keep solids from building up at the bottom of the tower.



There are several forms of filters and industry groups such as ASHRAE and the Association of Water Technologies recommend filters for their effectiveness in controlling *Legionellosis* and increasing the life of your equipment.

Installing a filtration system provides an added benefit in that it can also be used to help disinfect the water during the annual startup process. The filtration system can circulate the water at the tower base without the need to run the condenser pumps or tower fans, which allows the disinfectant to mix with the water without creating a risk that untreated pathogens might escape into the environment.

FILTRATION SYSTEMS AND ANSI/ASHRAE COMPLIANCE

In order to comply with the ANSI and ASHRAE standard for managing the risk of *Legionellosis* (ANSI/ASHRAE Standard 188-2018), sites with building water systems must follow a documented Water Management Program. That program must include a water treatment plan for minimizing corrosion, scaling, and microbiological activity in the cooling towers.

Filtration systems alone aren't enough to reduce the risks of corrosion, scaling and microbiological growth. ASHRAE Guideline 12-2020 recommends a three-pronged approach, using chemical inhibitors and surfactants to reduce corrosion and scaling, filtration to reduce the level of solids, and biocides to minimize biological activity. By reducing the level of solids, the filter provides the added benefit of reducing the amount of chemicals needed to effectively treat the water.

Sidestream filters can be an important tool in complying with ANSI/ASHRAE standards. If you're interested in learning more, or would like assistance with planning and installing a filtration system, Solid Blend is available to help.