

Sidestream Water Filtration For Cooling Towers: How And Why It Will Save You Money

Sidestream water filters are a cost-effective solution that can easily improve water quality, cooling tower efficiency and reduce maintenance costs.

EDGECLIFF, NSW, AUSTRALIA, October 27, 2020 /EINPresswire.com/ -- 1.

INTRODUCTION

Cooling towers draw air through the internal fill to provide the evaporative conditions that are responsible for water cooling. Rule-of-thumb says that around 900–1800 m³ of air is in contact with each m³ of water.



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David Garcia

The air will normally contain particles of dust, soil, organic matter and other small contaminants in suspension. These particles are dragged from the air and carried by the [cooling tower](#) water stream, where they are incorporated as suspended matter.

Hence the atmospheric environment of any cooling tower will play a major role in the efficiency, thermal performance and maintenance costs of the cooling

system.

Airborne particle concentration is difficult to predict and elements such as wind direction or the industrial activity around the cooling tower will have a significant outcome.

In addition to the air contaminants, the cooling tower itself generates particles: corrosion products, mineral precipitates (iron oxides, hardness salts), microbiological colonies etc. All together, the suspended particles in the cooling tower stream are responsible for deposits in heat transfer surfaces, promote accelerated corrosion, fouling and biological growth.

2. WHY SIDESTREAM [WATER FILTRATION](#)

Sidestream water filtration is an effective method of minimizing problems caused by suspended solids in cooling tower water. Reducing the concentration of suspended particles in cooling

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water is beneficial in many ways:

Helps reducing biological growth in cooling water as suspended organic matter is a good source of nutrients for micro-organisms

Inorganic and organic suspended particles react with the chemicals injected in the system to prevent scaling and corrosion. This means more chemical dosing to obtain the same results

Lower maintenance costs as cooling tower cleaning is very labour-intensive

Minimises heat-exchanger losses, reducing particle accumulation in heat transfer surfaces



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3. SIDESTREAM WATER FILTRATION VS FULL STREAM FILTRATION

When designing a sediment filter for a cooling tower system there are two options:

Full-flow water filtration: This solution will filter the whole recirculation water in each cycle
Sidestream water filtration, in which only a portion (typically 5%) of the whole recirculation water is filtered in each cycle

There are a number of benefits in using a sidestream filter instead of a full stream filtration system:

Sidestream filters are smaller in size, as the volume of water to treat is smaller

Sidestream water filtration is generally enough to remove the suspended particles from the recirculation water

Sidestream filters can be backwashed and maintained while the cooling tower is in operation without downtime.

Sidestream water filters are easy to install with little or no impact on the normal operations of the cooling tower

As a result, sidestream sediment filters are the most cost-effective option and can easily improve water quality, increase the cooling tower efficiency and reduce the maintenance costs.

4. WHERE TO INSTALL THE SIDESTREAM FILTRATION SYSTEM?

Sidestream water filtration equipment can be physically installed in two ways:

After the cooling tower, on the discharge side of the pump. Water is drawn, filtered and returned to and from the main cooling water stream. This method can be expensive and care must be taken to prevent water recirculation paths

Next to the cooling tower basin, from where water will be drawn, filtered and returned. This is our preferred installation method

5. HOW TO KNOW WHEN SIDESTREAM FILTRATION IS REQUIRED?

The easiest way to identify when suspended particles represent a problem to the cooling system is to inspect the cooling tower basin. Any accumulation of particles in that area will indicate that suspended matter is significant and sidestream filtration is needed.

If water analysis is available with TSS (total suspended solids) count, a limit of 5 mg/L is usually the top threshold to decide whether sidestream water filter makes sense.

6. WHAT TYPE OF SEDIMENT FILTER?

Before deciding what type of water filter is best for the cooling tower sidestream sediment removal, we must identify the particle size to be filtered.

Airborne particles capable of entering the cooling water are those small enough to stay in suspension in the air. Particles larger than 30 micron are quite uncommon due to their weight. Hence the typical size range for particles in suspension in the cooling tower water is 2-30 μm .

There are different filtration systems that remove particles in that size range. The most common are:

Cartridge or bag filters for small commercial cooling systems

Media sediment filters for industrial cooling towers. These filters provide removal efficiencies higher than 90% for suspended solids in the size range of 2 to 30 μm at filtration rates as high as 25 m/h.

7. OTHER CONSIDERATIONS

Apart from particles in suspension, there are more subtle contaminants in the air that can be absorbed by the cooling water and are responsible for other difficulties: acidic and alkaline gases in the atmosphere.

The most common gases in the atmosphere are acidic and when they are dissolved in cooling tower water, the resulting chemistry will have an impact on the pH of the water. An example is the presence of CO₂ and Sulphur gases in the air when the cooling tower is installed near a boiler chimney. Whenever the boiler is in operation, the exhaust gases will tend to reduce the PH and will compromise the [chemical dosing control](#).

8. CONCLUSION

Sidestream sediment filters are a cost-effective solution that can easily improve water quality, increase the cooling tower efficiency and reduce the overall maintenance costs.

Watercore industrial sediment filters, based on activated alumino-silicate glass filtering media,

are highly recommended for cooling tower sidestream filtration. Offering double the performance of a sand filter, up to 100 times better at removing sub-5 micron particles, and high filtration rates, our sediment filters are ideal when footprint is a concern.

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