

Cooling Tower Side Stream Filtration

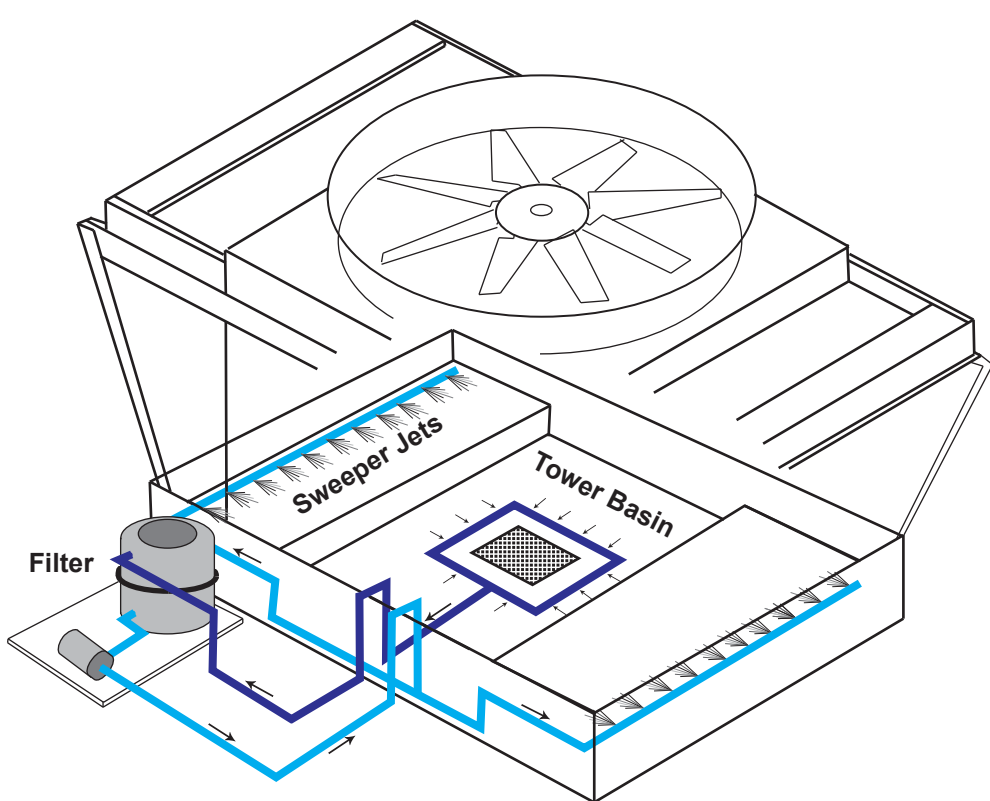
Suspended solids

Cooling towers scrub particulates from the air on a continuous basis while in operation. Particulate matter can include dust, construction debris, leaves, blooms, or bugs and may vary depending upon nearby activity or the time of year.

Precipitated solids, corrosion by-products, and makeup water are other common sources of suspended solids.

Why suspended solids are a problem

- Contributes to deposit formation in cooling water systems leading to corrosion, reduced heat transfer efficiencies, and flow blockages.
- Stresses the current water treatment program.
- Provides a place for bacteria to attach and grow, which increases the potential for microbiologically induced corrosion (MIC).



Side Stream Filtration System

Did you know?

Research has shown that in some cases, a 200-ton cooling tower can accumulate **more than 600 pounds** of suspended matter from the air and makeup water over the course of a year.

Controlling the problem

Filtration can be used to remove suspended solids from cooling system water. Technologies include sand, multi-media, bag, cartridge, centrifugal, screen, and disk filters, depending upon the particulate size, loading, and cooling system volume.

Sand filters are often recommended for cooling water systems.

Benefits

- Reduced potential for under-deposit corrosion
- Improved chemical performance
- Improved biocide efficacy and microbiological control
- Reduced mechanical wear
- Improved heat transfer due to reduced deposition and fouling

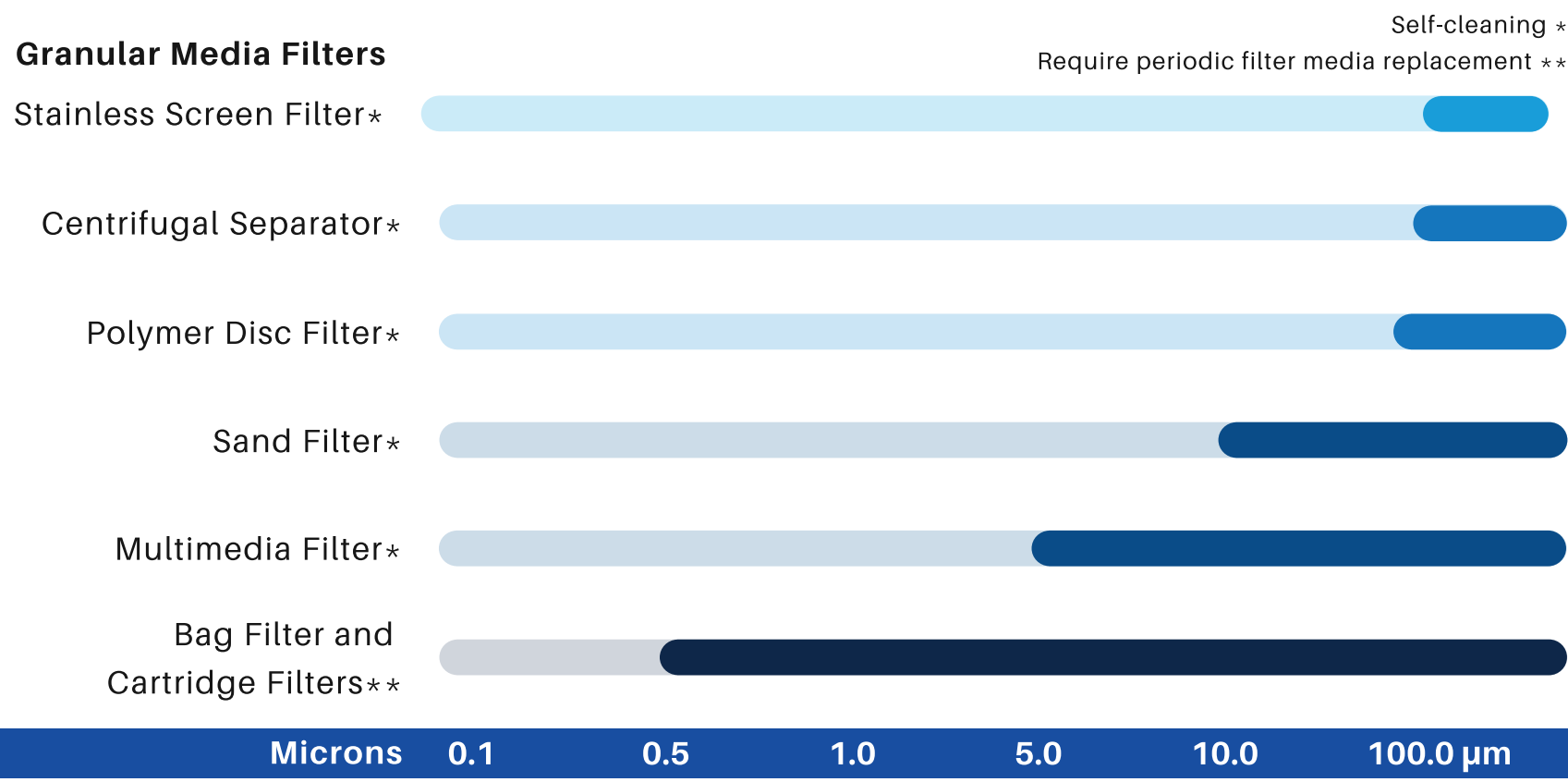
Sizing Recommendations

As a rule of thumb, passing 3% to 5% of the recirculating water through a side stream filter will reduce suspended solids by up to 80% to 90% at 5 to 8 cycles of concentration.

Common Types of Filters

One micron (1 μm) is one millionth of a meter

(the human eye can see 30-40 μm table salt = 100 μm)



Some methods of filtration are **better suited than others** for removing particles of a particular size.

Side Stream vs. Full Stream filtration

Installing the correct filter on a side stream of cooling system water can be effective at reducing suspended solids to acceptable levels.

Filtering the full cooling water stream is not typical due to larger capital costs and the risk of interrupting cooling water flow if a filter becomes plugged with solids.

Additional Enhancements

Multiple Filtration Methods

In some cases, it may be beneficial to combine two or more filtration methods for more effective particle removal. For example, a side stream of cooling tower water may be passed through a sand filter to remove the larger particles followed by a one micron bag filter to remove the smaller particles.

Basin Sweepers

Sweeper jets direct solids towards the filter inlet in a sweeping pattern. The sweeper jet is a cost effective method for preventing build-up of dirt, scale, other contaminants in cooling tower basins, sumps, and machinery reservoirs.