An Industrial Facility's Guide to

COOLING TOWER WATER TREATMENT

A PUBLICATION OF SAMCO TECHNOLOGIES

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TABLE OF CONTENTS

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Chapter One

WHAT IS A COOLING TOWER WATER TREATMENT SYSTEM AND HOW DOES IT WORK?

COOLING TOWER WATER TREATMENT SYSTEMS

What they are and how they work

For an industrial company using a cooling tower for its facility, some type of cooling tower water treatment system is usually necessary to ensure an efficient process and lengthy equipment service life. If cooling tower water is left untreated, organic growth, fouling, scaling, and corrosion can **reduce plant productivity, cause plant downtime, and require costly equipment replacements down the road.**

But **what is a cooling tower water treatment system and how does it work?** This chapter breaks down the basics below:

What is a cooling tower water treatment system?

A cooling tower water treatment system is **an arrangement of technologies that remove damaging impurities from the cooling tower feed water, circulation water, and/or blowdown.** The specific configuration of the system will depend on several things, including:

- what type of cooling tower the facility has (open-recirculating, once-through, or closed-loop)
- quality of the feed water
- manufacturer-recommended quality requirements for the cooling tower and equipment

- chemistry/makeup of the circulatory water
- regulatory requirements for discharge
- whether or not blowdown will be treated for reuse in the cooling tower
- type of heat exchanger
- cycle of concentration

What's included in a basic cooling tower water treatment system?

As mentioned above, the exact components of a cooling tower water treatment system depend on the **quality of feed water and chemistry of circulatory water in relation to the quality of water needed for the specific cooling tower and related equipment** (according to the manufacturer's recommendations), but in general, a basic cooling tower water treatment system typically includes some type of:

- clarification
- filtration and/or ultrafiltration
- ion exchange/softening
- chemical feed
- automated monitoring

Depending on the impurities present in the water, any combination of these treatments might best suit the facility and make up its treatment system, so it's important to consult with a water treatment

specialist to ensure the right system for the facility's specific tower is being considered. Depending on the needs of the cooling tower and process, these standard components are usually adequate. However, if the tower requires a system that provides a bit more customization, there might be some features or technologies that will need to be added on.

What does a cooling tower water treatment system typically control?

A cooling tower water treatment system might be made up of the technologies necessary to regulate the level of:

- **alkalinity;** dictates the potential of calcium carbonate scale
- **chlorides;** can be corrosive to metals, and different levels will be tolerated based on materials of the cooling tower and equipment
- **hardness;** contributes to scale in the cooling tower and heat exchangers
- **iron;** when combined with phosphate, iron can foul equipment
- **organic matter;** promotes microorganism growth, which can lead to fouling, corrosion, and other system issues
- **silica;** known for causing hard scale deposits
- **sulfates;** like chlorides, sulfates can be extremely corrosive to metals
- **total dissolved solids (TDS);** contribute to scaling, foaming, and/or corrosion

- **totals suspended solids (TSS);** undissolved contaminants that can cause scaling, biofilms, and/or corrosion

How does a cooling tower water treatment system work?

Specific treatment processes vary depending on the requirements of the cooling tower and quality/chemistry of the feed and circulation water, but a typical cooling tower water treatment system will usually include the following steps:

Cooling tower makeup water intake

Makeup water, or the water replacing bleed, evaporated, and leaked water from the cooling tower, is first drawn from its source, which could be raw water, city water, city-treated effluent, in-plant wastewater recycle, well water, or any other surface water source.

Depending on the quality of this water, it may or may not need treatment here. If a water treatment system is needed at this part of the cooling tower water process, it is usually technology that removes hardness and silica or stabilizes and adjusts the pH.

At this point in the process, the proper treatment optimizes the tower evaporation cycles and minimizes the water bleed rate to drain beyond what might be done with chemicals alone.

Filtration and ultrafiltration

The next step is generally running the cooling tower water through some type of filtration to remove any suspended particles such as sediment, turbidity, and certain types of organic matter. It is often useful to do this early on in the process, as the removal of suspended solids upstream can help protect membranes and ion exchange resins from fouling later on in the pretreatment process. Depending on the type of filtration used, suspended particles can be removed down to under one micron.

Ion exchange/water softening

If there's high hardness in the source/makeup water, there may be treatment for the removal of the hardness. Instead of lime, a softening resin can be used; a strong acid cation exchange process, whereby resin is charged with a sodium ion, and as the hardness comes through, it has a higher affinity for calcium, magnesium, and iron so it will grab that molecule and release the sodium molecule into the water. These contaminants, if present, will otherwise cause scale deposits and rust.

Chemical addition

At this point in the process, there is typically the use of chemicals, such as:

- **corrosion inhibitors** (e.g., bicarbonates) to neutralize acidity and protect metal components

- **algaecides and biocide** (e.g., bromine) to reduce the growth of microbes and biofilms
- **scale inhibitors** (e.g., phosphoric acid) to prevent contaminants from forming scale deposits

Thorough treatment prior to this stage can help reduce the amount of chemicals needed to treat water at this point in the process, which is ideal considering many chemical treatments can be expensive.

Side-stream filtration

If the cooling tower water is going to be recirculated throughout the system, a side-stream filtration unit will be helpful in removing any problematic contaminants that have entered through drift contamination, leaks, etc. A good rule of thumb is that if a facility's cooling tower water treatment system requires side-stream filtration, about 10% of the circulating water will filter through. It typically consists of a good-quality multimedia filtration unit.

Blowdown treatment

The last part of treatment required for cooling tower water is the blowdown or bleed from the tower.

Depending on how much water the cooling plant needs to circulate for proper cooling capacity, plants will choose to recycle and recover the water through some type of post treatment in the form of reverse osmosis or ion exchange, especially in places where water might be scarce. This allows liquid and solid waste to be concentrated and

removed while treated water can be returned to the tower and reused.

If the water from the blowdown needs to be discharged, any discharge the system creates will need to meet all regulatory requirements. In certain areas where water is scarce, there could be large sewer connection fees, and demineralization systems can be a cost-effective solution here, as they can help minimize the cost to connect to water and sewer lines. Also, the discharge of the cooling tower bleed must meet local municipal discharge regulations if the effluent is being returned to the environment or a publicly owned treatment works (POTW).

Chapter Two

HOW DO YOU KNOW IF YOU NEED A COOLING TOWER WATER TREATMENT SYSTEM FOR YOUR PLANT?

DO YOU NEED A COOLING TOWER WATER TREATMENT SYSTEM?

How to know if it's necessary

In order to keep production flowing smoothly and avoid costly damage to cooling tower equipment, the proper treatment of the cooling tower water is essential.

But **how do you know if a facility needs a cooling tower water treatment system**?

Keep in mind that treatment methods will vary depending on the facility's specific cooling tower chemistry, makeup water needed, and whether it's an open- or closed-loop process, but if you are using a cooling tower for a facility's process or to cool its building, chances are it will need some type of water treatment system.

In this chapter, we break down the various reasons below:

Alkalinity and pH levels too high or low

When it comes to regulating pH and alkalinity in cooling tower water, the proper balance between equipment and process is key. Since this balance can vary depending on the cooling tower system and the quality of the facility's water source, it is recommended that you

consult a water treatment specialist. In general, however, lower pH/alkalinity levels **reduce the likelihood and amount of scaling in the cooling tower**.

Controlling acid feed, softening, and pH/alkalinity is critical and should be closely monitored. Failure to do so can lead to rapid scale formation and/or corrosion to equipment.

High amount of hardness and total dissolved solids

High hardness and total dissolved solids (TDS), especially in the form of calcium carbonate, can also lead to heavy scaling. As water evaporates, removing the heat for cooling, the solids remaining concentrate. If they are not properly removed in blowdown or prevented in the first place by properly treating cooling tower water, the solids and hardness begin to **build up on heat transfers and other internal piping**. This can clog the system and lead to downtime or failure. In general, it's best to ensure water and makeup water chemistry are being treated properly to avoid this issues in the first place, as once the scale is formed, it's difficult and costly to remove.

Microorganisms in cooling tower water

Cooling tower water, especially in open-recirculating system, are susceptible to microbial growth. These biofilms occur when favorable conditions promote the growth of bacteria that lead to **fouling, corrosion, and other system issues**. The level of problematic bacteria will vary depending on the water source and the type of cooling

tower a facility has, but in general, cooling towers can be a breeding ground for certain type of bacteria, fungi, and algae. Cooling towers can also grow harmful bacteria such as legionella, which is naturally present in surface water and has been known to cause people to get extremely sick and can even lead to death. It's important to closely monitor these growths and treat them as necessary since most states have mandates for treatment and testing.

Depending on the microbiological contaminants present, certain membranes are efficient, as well as certain biodispersants and oxidizing and nonoxidizing biocides.

Insufficient water supply

In places where water supplies are scarce, it is likely local regulations will prevent a facility from drawing too much water from the source or releasing too much water into the environment. In this circumstance, **it can be beneficial to treat cooling tower blowdown for reuse**.

Any discharge a system creates will need to meet all regulatory requirements as well. In certain areas where water is scarce, there could be large sewer connection fees, and demineralization systems can be a cost-effective solution here as they can help minimize the cost to connect to water and sewer lines. Also, the discharge of cooling tower bleed must meet local municipal discharge regulations if the effluent is being returned to the environment or POTW.

Treating cooling tower water properly is essential to the success and efficiency of your process. Organic growth, fouling, scaling, and

corrosion are all challenges that can reduce plant productivity and require costly equipment replacements down the road.

When it comes to deciding if a facility needs treatment for its cooling tower water, using these points as a general guide can be helpful, but it is extremely important to consult a water treatment specialist. The chemistry and required makeup water will depend on the plant's individual needs, and these factors and how they affect the productivity of your facility can be extremely complex.

Chapter Three

COMMON COOLING TOWER WATER TREATMENT PROBLEMS AND HOW TO SOLVE THEM

COMMON COOLING TOWER WATER TREATMENT PROBLEMS

What are they? How do you avoid them?

For companies using cooling towers to remove heat from an industrial process or for cooling large buildings, there are several issues that can surface during the cooling tower water treatment process that we see on a regular basis. Because these issues occur often, it's important to know what to look out for in advance, perhaps saving the facility time and resources down the line.

Keep in mind that these issues will vary depending on whether the cooling tower is an open-recirculating system, once-through, or closed-recirculating. We've broken out some of the most **common problems with cooling tower water treatment and how to solve them** below:

High amount of blowdown

The problem

Since cooling towers remove heat by the process of evaporation, it's no surprise that they can use lots of water to make up the difference.

Depending on the quality of makeup water being added to the cooling tower and the operation efficiency of the unit, **large amounts of solids can remain after evaporation occurs**, causing an increased need to "blow down" or remove solid waste and dissolved solids buildup from the circulation water before it has a chance to scale or corrode equipment.

When blowdown occurs, circulation water and treatment chemicals are also lost along with the solid waste, so it's important to monitor this closely. If the cooling tower requires too much blowdown, it could be an indication that the water treatment system isn't running as efficiently as it could be or feeding the cooling tower water pure enough for the process.

An effective cooling tower water treatment system will provide the right quality of water to the cooling tower and the correct circulation chemistry, allowing it to run efficiently. This helps avoid problematic deposition and maintain a manageable amount of blowdown. This, in turn, helps conserve the amount of any makeup water or chemicals needed and results in a higher-solid waste.

Possible solutions

If a higher-than-normal amount of blowdown is required, consult your cooling tower water treatment expert. Depending on what's causing the issue, **some solutions to decreasing the amount of cooling tower blowdown might include**:

- Improved feed water filtration
- Higher-quality side-stream filtration
- Increased cycle of concentration (depending on quality of makeup and circulation water—keep in mind this is not always the right solution)
- Maintaining better makeup water chemistry by removing scale-forming and corrosion-causing impurities.
- Change or closely manage the cooling tower feed chemistry program.

Low cycle of concentration

The problem

In cooling towers, the cycle of concentration is **a ratio that measures how concentrated solids are in the cooling tower process water compared to the makeup water** by measuring conductivity in the blowdown. A facility should see at least three to three to six cycles of concentration (which is three to six times the concentration of solids in the circulation water than the original makeup water). Over five is ideal. The higher your cycle of concentration, the lower your need for makeup water and blowdown, thus saving water, chemicals, and cost.

For systems operating at a low cycle of concentration, **water consumption and chemical usage can increase greatly**, causing excess costs to add up. Some cooling tower operators will run their

cooling tower at a low cycle of concentration intentionally (for example, if the cooling water is used for ash disposal), but most aim for a higher cycle of concentration.

Possible solutions

As the case with many water treatment solutions, and as previously mentioned, it's best to consult your cooling tower water treatment specialist, as the quality of the source water, chemistry of the makeup water, and type of cooling tower being used will dictate what treatments are necessary to achieve the best cycle of concentration for the facility. In general, however, **some solutions to increasing cycles of concentration can include**:

- better cooling tower control by minimizing blowdown monitoring conductivity
- pH/alkalinity control to minimize scale formation
- decreasing feed hardness, iron, and silica
- manage microbial growth

Not accounting for treatment of secondary waste

The problem

Any discharge that the system creates needs to **meet all local regulatory requirements**. Contaminants from the feed water impact the volume and processing requirements in secondary waste. Also, sometimes these secondary wastes need to be treated and

discharged, yet many times they are discharged to a POTW or wastewater facility and they must meet the requirements of that facility.

Possible solutions

It's best to **get a copy of the permit requirements, carefully analyze them, and design the secondary treatment processes and blowdown handling to meet the effluent discharge accordingly**. Sometimes this includes releasing to the environment under a SPEDES permit. These permissions need to be negotiated in advance to be sure that the plant will achieve the effluent goals or discharge.

Water scarcity/supply

The problem

Water is becoming more and more scarce, and where facilities are already seeing these water shortages, **local regulations restricting how much water a facility can draw from its source and discharge will grow more stringent**. If a facility draws water from or discharges to a municipal source, it might already be experiencing higher sewer connection fees.

When a cooling tower is running inefficiently, it can require too much makeup water and cause excess blowdown. Also, the discharge of cooling tower bleed must meet local municipal discharge regulations if the effluent is being returned to the environment or

POTW, so it's important to address these issues head-on to avoid large fines.

Possible solutions

For blowdown, posttreatment in the form of reverse osmosis or ion exchange can prove extremely beneficial. This allows liquid and solid waste to be concentrated and removed while **treated water can be returned to the tower and reused.** These systems depend on the plant location and specific environmental factors.

For example, if a plant is looking to treat the blowdown and about 75% of the water needs to be recovered and reused, a simple recovery system can be beneficial. If regulatory requirements demand complete zero liquid discharge (ZLD), systems at this level might include evaporation and crystallization.

Demineralization systems can also be a cost-effective solution here, as they can help minimize the cost to connect to water and sewer lines.

Being aware of potential cooling tower water treatment issues and knowing how to solve them is essential to the success and efficiency of your process. High amounts of blowdown, low cycles of concentration, local regulations, and water scarcity are all issues that can challenge plant productivity and, if not managed properly, require costly equipment replacements down the road.

Chapter Four

TREATED VS. UNTREATED COOLING TOWER WATER: RISKS FOR YOUR PLANT

TREATED VS. UNTREATED COOLING TOWER WATER

What are the risks?

When a facility is deciding whether or not to invest in a cooling tower water treatment system, it is a decision that shouldn't be taken lightly.

Petrochemical plants, chemical manufacturers, refineries, and all kinds of industrial plants require cooling towers, whether they're used as part of the industrial process or for cooling/removing heat from the building. Improperly treating cooling tower feed water, circulation water, and blowdown can lead to several issues; the four most common being **scaling, corrosion, fouling, and biological growth**.

These issues can be detrimental to the success and efficiency of your cooling tower, affecting the energy and water usage of the cooling tower and increasing how much it costs to operate the unit in the long run. However, in most cases these issues are preventable by means of proper water treatment.

Keep in mind that **treatment methods will vary depending on the specifics of cooling tower chemistry, makeup water needed, and whether it's an open- or closed-loop process**.

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This chapter breaks down how each of these issues might affect your cooling tower:

Scaling

When water is heated, certain **compounds that might be soluble in low-temperature waters become insoluble in high-temperature water and can scale** (form hard deposits) on surfaces within the unit if left untreated, plugging up and damaging pipes and internal surfaces and equipment.

Some **common compounds that scale cooling towers** include:

- calcium carbonate
- calcium phosphate
- magnesium silicate
- silica

In addition to temperature, **alkalinity (pH) can also play a major role on scaling** within a cooling tower. As pH increases, many scale-forming compounds decrease in solubility, precipitating out in higher rates when the water is heated.

Another factor that can affect how much scale formation takes place is the **amount of the scale-causing contaminants** present in the water. If the volume of these scale-causing contaminates becomes greater than their natural saturation point due to evaporation in cooling tower, scale is likely to occur regardless off the alkalinity or temperature, so you can see there are several factors that will determine how much scale the cooling tower will accumulate.

Treatments to prevent these issues might include feed water and circulation side-stream filtration, pH control, chemical scale inhibitors, and monitoring concentration cycles and blowdown. As with any type of cooling tower water treatment, it's best to consult your water treatment specialist to ensure the right balance is achieved, as each system will have individual characteristics, but in general, **treating these issues before they have a chance to scale in the cooling tower will prevent these issues to begin with**.

Corrosion

If cooling tower water isn't properly treated, corrosion can occur. This happens when certain **contaminants in the water, mainly gasses such as oxygen and carbon dioxide, cause the metal to degrade and return to its oxide state by means of an electrical or electrochemical reaction**. This thins areas in the metal, increasing chances of rupture. Corrosion can be serious and lead to equipment failure, plant downtime, or the loss of heat transfer.

Different types of corrosion commonly seen in cooling towers include:

- **Pitting;** extremely destructive because it is concentrated on small areas, this type of corrosion is the hardest to detect and can perforate metal in a short timeframe.
- **General;** this type of corrosion occurs evenly across the surface of the metal and can contribute to fouling, reducing system efficiency.

- **Galvanic;** this type of corrosion occurs when two different metals come into contact enough to conduct electricity. The electrical differences attack the more active metal, corroding it rapidly.

In addition to dissolved gasses, **some other factors** that can lead to corrosion in a cooling tower can include:

- Bacterial contaminants
- Variations in temperature
- Alkalinity (pH)
- Dissolve and/or suspended solids

Choosing not to treat the cooling tower water for these corrosion-inducing contaminants can be costly and dangerous. Some solutions might include **filtration, building the system with corrosion-resistant materials (such as stainless steel piping), and using certain chemical corrosion inhibitors**.

Fouling

Fouling occurs in cooling towers similar to scaling; it accumulates deposits, but these deposits are not as hard as scale.

Some contaminants that cause fouling can include:

- Colloidal and suspended solids
- Biological contaminants
- Silt
- Sand

If left untreated, these contaminants can cause deposition severe enough to plug piping and heat exchangers and reduce the efficiency of the cooling tower. Depending on which contaminants are present and at what part of the cooling tower process, water treatment options can include certain chemical dispersants, side-stream filtration, periodic blowdown, and continuous monitoring.

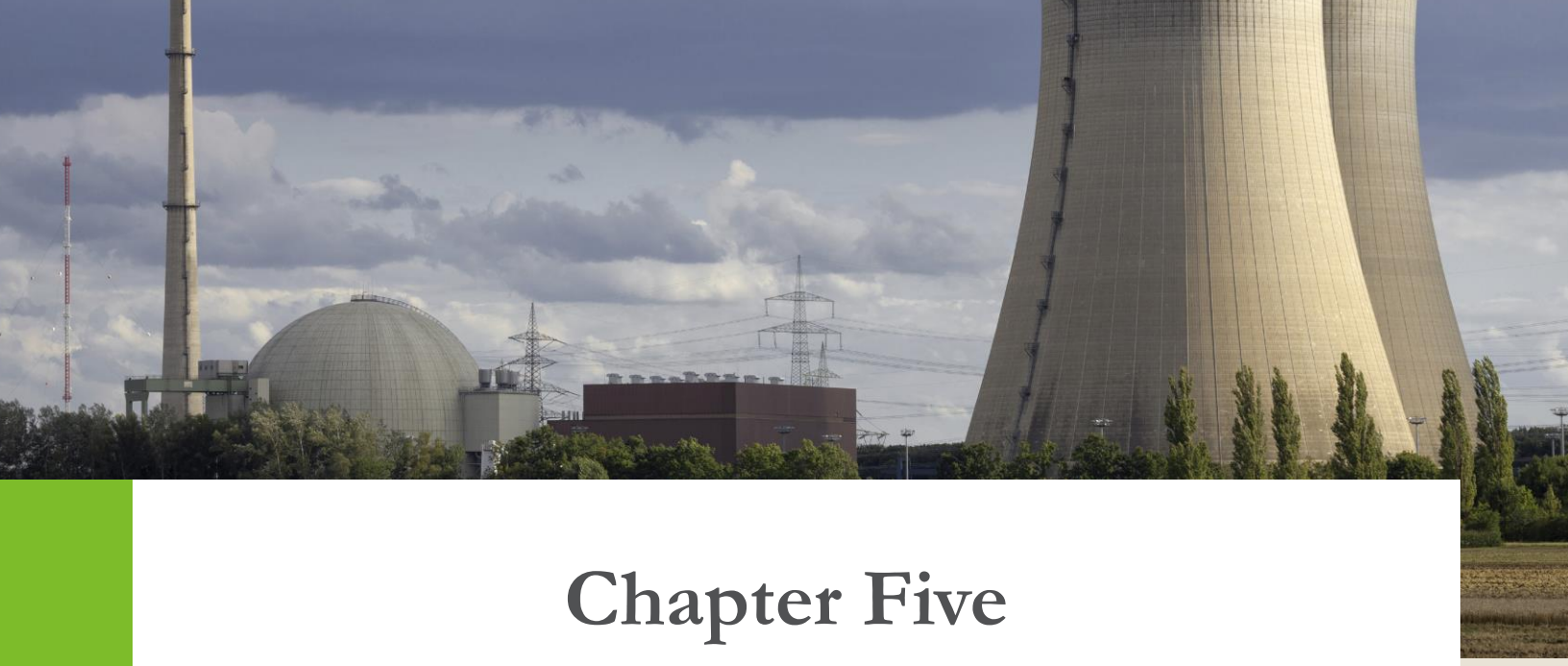
Biological growth

The growth of microbiological contaminants in cooling tower water such as bacteria, algae, and fungi, can cause all of the aforementioned issues: **corrosion and fouling of cooling tower equipment**.

Biological growth can occur in any kind of cooling tower system, but happens most in open-loop systems whereby the cooling tower water is more readily exposed to the elements and favorable environments for biological growth.

If you choose not to treat the cooling tower water for biological growth, chances are microbe growth will run rampant, **causing leaks and fouling in the system, and promoting slime formation that can reduce heat transfer and accelerate the rate of corrosion**.

As mentioned in a previous chapter, cooling towers can also grow harmful bacteria, such as legionella, which is naturally present in surface water and has been known to cause people to get extremely sick and can even lead to death. Most states have mandates for legionella treatment and testing. Depending on the microbiological contaminants present, certain membranes are efficient, as well as biodispersants and oxidizing and nonoxidizing biocides.



Chapter Five

HOW MUCH DOES A COOLING TOWER WATER TREATMENT SYSTEM COST?

WHAT COOLING TOWER WATER TREATMENT SYSTEMS COST

Pricing, factors, etc.

By now, we know that treating cooling tower water properly is essential to the success and efficiency of a facility's process. Organic growth, fouling, scaling, corrosion, and water scarcity are all challenges that can reduce plant productivity and require costly equipment replacements down the line, but **"How Much Does a Cooling Tower Water Treatment System Cost?"**

In order to keep production flowing smoothly and avoid costly damage to equipment, the proper treatment of the cooling tower water is essential. The cycles of concentration within the tower are determined by scaling and fouling components in the feed water. Typical contaminants that affect the amount of cycles than can be run are hardness, TDS, TSS, iron, and silica.

The three main areas of the cooling tower process that require treatment are: **feed water** to the cooling tower, **circulatory water** in the tower, and cooling tower **bleed to drain**.

In this chapter, we break these down and consider the different treatment options and costs associated with these systems:

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Treating cooling tower feed water

Depending on the quality of the cooling tower **feed water**, you may or may not need treatment here. If a water treatment system is needed at this part of the cooling tower water process, it is usually technology that removes hardness and silica or stabilizes/adjusts the pH.

At this point of the process, the proper treatment optimizes the tower evaporation cycles and minimizes the water bleed rate to drain beyond what might be done with chemicals alone.

In general, the cost for a system to treat cooling tower feed water will be approximately **$50,000–$100,000 at 100 GPM feed rate for equipment, $100,000–$250,000 if treatment needs require a softener and desilicizer**.

Treating cooling tower circulation water

The second area of physical treatment a cooling tower will typically need is for the **circulation water** within the tower.

Normally some form of side-stream filtration is your best bet. This helps keep cooling tower water free of particles that can build up and foul it.

By running approximately 10% of the circulated water through the side-stream filter, it can be easier to retain a healthy balance of suspended solids that will reduce the particulate fouling of equipment.

A typical side stream filtration unit will usually run between $50,000 at 100 GPM to $300,000 at 1,000 GPM, depending on the type of filtration needed.

In addition to side-stream filtration, cooling towers will require chemical treatment additives to maintain the circulation system and control scale, corrosion, and biological fouling. The cost of equipment and chemicals needed for this part of the process would be in addition to the figures mentioned above, so be sure to keep this in mind when calculating the project costs.

There may also be several solutions for this part of the process, so keep in mind this cost might fluctuate depending on your facility's specific needs.

Treating cooling tower blowdown

The last part of treatment required for cooling tower water is the **blowdown or bleed** from the tower.

Depending on how much water the cooling plant needs to circulate for proper cooling capacity, plants will choose to recycle and recover the water through some type of posttreatment in the form of reverse osmosis or ion exchange, especially in places where water might be scarce.

This allows liquid and solid waste to be concentrated and removed while treated water can be returned to the tower and reused. These systems have several factors that go into estimating cost and depend upon the plant location and specific environmental factors.

For example, if a plant is looking to treat the blowdown and about 75% of the water needs to be recovered and reused, a simple recovery system would run about **$300,000 for a 100 GPM stream**. If regulatory requirements demand complete zero liquid discharge (ZLD), systems at this level (including evaporation and crystallization) can go from about **$3 to $5 million**.

Other important factors to consider when pricing a cooling tower water treatment system

- ***Cooling tower circulation water makeup and chemistry*.** Cooling tower water makeup/chemistry is a complex calculation, but this information is essential to developing the most efficient solution possible.
- ***Upfront planning*.** There are costs associated with developing the concepts, designs, and regulatory requirements for these types of projects. Typically, the cost of engineering for a project like this will be about 10–15% of the entire project cost. This cost is usually phased in over the course of the project.
- ***Installation rates*.** Installation rates for a cooling tower water treatment system will usually run 15–25% of the project. In general they have a smaller footprint and don't require as much civil work. Another thing to keep in mind is the installation rates in your area, which may fluctuate by location. Since the cooling tower water treatment systems are usually prepackaged, their footprint is typically smaller (between 300 and 10,000 square feet, depending on flow rate).

- ***Shipping the system to the plant*.** When you are coordinating the shipping details of the system, you usually want to factor in about 5–10% of the cost of the equipment for freight. This can vary widely depending upon the time of year you are purchasing the system in addition to where the plant is located in relation to the manufacturing facility.
- ***System discharge and connection fees*.** Any discharge the system creates will need to meet all regulatory requirements. In certain areas where water is scarce, there could be large sewer connection fees, and demineralization systems can be a cost-effective solution here as they can help minimize the cost to connect to water and sewer lines. Also, the discharge of the cooling tower bleed must meet local municipal discharge regulations if your effluent is being returned to the environment or POTW.

In short, treating your cooling tower water can be a complex assortment of solutions depending on your plant's individual needs. For more pricing information or to get in touch, contact us to set up a consultation with an engineer or request a quote. We can walk you through the steps for developing the proper solution and realistic cost for your cooling tower water treatment system needs.

HOW CAN SAMCO HELP?

SAMCO has over 40 years' experience helping design and engineer some of the most complex cooling tower water treatment systems in the industry. For more information about what we offer and how we can help your facility, please visit our website or contact us to schedule a consultation with one of our skilled engineers.

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