PENTAIR
EVERPURE

A CLEAR **ADVANTAGE**

Optimizing Water Quality
for Foodservice Operations

TABLE OF CONTENTS

50-75% OF ICE MACHINE SERVICE CALLS ARE WATER-RELATED*

It may seem straightforward, but foodservice and hospitality operations spend a lot of time thinking about water, ice, and their ice-making equipment. Water chemistry can be complex but recommending the best water treatment solution shouldn't be.

To provide your commercial customers with the best systems possible, it's important to understand how water quality affects ice quality, how it impacts equipment performance, and why both are critical to your customers' profitability.

*Source: Dick Wirz
Refrigeration for Air Conditioning Technicians, Cengage Learning, 2018, 2010 p. 350

Product Quality

With ice, water quality problems have nowhere to hide. Sulfur, iron, chlorine and other contaminants lend unpleasant tastes and odors to ice, and by extension, the beverages that ice is used in. Particulates contribute to inconsistent formation and cloudy, unappealing ice. Because their patrons notice these things, so do your restaurant and foodservice customers.

Equipment Performance

Poor quality water can increase maintenance downtime and shorten the life of an ice machine, both of which are added expenses in an industry with thin margins to begin with. Properly treated water reduces scale buildup and helps reduce corrosion. Recommending water treatment technology that protects equipment and improves operational efficiency gives your customers a clear advantage they'll appreciate.

WATER TESTING AND WHAT IT REVEALS

WATER'S CHARACTERISTICS AND ITS COMMON CONTAMINANTS

Ice is 100% water, but water itself isn't just H2O. Water is a natural solvent, carrying away particles of whatever it encounters along its way. It's these particulates, chemicals, and contaminants that can impact ice quality, ice consistency, and equipment performance.

Total Dissolved Solids (TDS)

A combined measure of all organic and inorganic substances dissolved in the water, including minerals, salts, metals and other particulates. High TDS levels cause cloudy ice and unpleasant taste.

Hard Minerals

The most common and expensive water-related problem with ice makers is limescale buildup made of dissolved calcium and magnesium ions. These hard minerals, along with other dissolved solids, are forced out during the freezing process and create a rock-like layer of scale that reduces performance and increases maintenance and downtime.

Particulates

Fine sediment, rust and other particles provide a catalyst for scale buildup and wear on equipment.

Chlorine

While added chlorine makes water safe to drink, it also contributes to corrosion in ice equipment and can give ice an offensive taste and odor.

Iron

In addition to giving water an unpleasant metallic taste, iron in water used in ice machines is a recipe for corrosion.

Alkalinity

Alkalinity is water's capacity to neutralize acid. High alkalinity can indicate an increased potential for hardness minerals to form scale; low alkalinity can indicate increased potential for corrosion.

pH

Water's balance of acid and alkaline substances can be an indication of whether it will be scale-forming or corrosive.

Chlorides

Even at low levels, chloride ions can penetrate the passive film on stainless steel and trigger corrosion.

Slime

As ice equipment draws in air, naturally occurring yeast and mold comes with it. This slimy mix can quickly expand, causing loss of performance, decreased efficiency, equipment malfunction and contamination.

The first step in finding the right water treatment solution for your customers is conducting a comprehensive on-site water analysis to determine the specific level of particulates, chemicals and contaminants in their water.

A water analysis is a "snapshot" of water characteristics at the time and place the sample was drawn. Although municipal water reports have value by measuring general safety and potability, they commonly combine samples from multiple sources and may not take seasonal changes into account. Therefore, municipal water reports alone may not provide an accurate picture of the water at a specific location.

GIVE YOUR CUSTOMERS THE RIGHT ANSWERS BY ASKING THEM THE RIGHT QUESTIONS

- [ ] How frequently does your equipment require service, and at what cost?
- [ ] How are downtime and service interruptions affecting your business?
- [ ] Are water-related problems covered under the equipment warranty?
- [ ] Are you looking for consistent quality across multiple locations?
- [ ] Is scale buildup affecting the performance of your ice machines?
- [ ] Are particulates causing your ice to cloud or taste off?

RECOMMENDING THE RIGHT SOLUTION

OPTIMAL WATER QUALITY FOR ICE FORMATION

With ice, water quality issues have nowhere to hide. Without question, the chemical and physical properties of water have a significant impact on ice quality and ice-making equipment. Optimal water quality can drastically reduce water-related problems and support years of consistent, trouble-free equipment performance.

Although there is not enough space in this book to cover all the water variables that can affect local water quality, for the sake of simplicity, we have limited our list to these primary optimal parameters for maximizing ice quality and reducing water-related equipment problems:†

Hardness
< 85 ppm

pH
6.80-7.40

Alkalinity
< 150 ppm

Chlorides
80 ppm

Chlorine
<0.05 ppm

TDS
70-200 ppm

Iron
<0.25 ppm

† These are only general guidelines. For recommendations and requirements specific to your equipment, reference the equipment manual provided by the manufacturer.

FINDING THE RIGHT TREATMENT

Filtration

Recommend filtration technologies to help your customers trap and hold particulates that can cause cloudy or bad-tasting ice. Different filtration media excel at removing different contaminants, and the finer the filter, the more particulates are removed.

In addition to our proprietary bacteria-inhibiting Micro-Pure® II filtration media, optional carbonless filtration in Everpure Insurice® systems can help prevent slime buildup and bacteria growth in ice machines and ice bins by allowing some chlorine to pass through.

Inhibiting Technology

Inhibiting systems suspend dissolved calcium minerals in a solution that inhibits them from forming scale and provides a protective barrier that guards against corrosion. These systems also provide chlorine reduction and nominal sediment reduction.

SELECTING THE RIGHT SYSTEM

UNDERSTANDING ICE MAKING

Once a water quality analysis has been done and the right water treatment technology has been determined, the next step is to determine what size system will fit an operation's usage requirements. You'll need to consider:

- Type of equipment used
- Size of connection
- Operational capacity/flow rate required

TYPES OF ICE-MAKING MACHINES

Some types of ice makers have more of a tendency towards limescale problems than others. In order to recommend the right system, you need to know what type of ice machine your customer is using.

Flake and Nugget Ice Machines

To form flake ice, water is frozen in a barrel-shaped evaporator before being scraped off by an auger and collected in a storage bin. Nugget ice is simply flake ice that has been compressed to form nuggets. In a flake ice machine, all the water (12.5 gallons per 100 pounds of ice) is used to produce ice. The minerals and sediment dissolved in the water are forced out during the freezing process, and since they have nowhere to go, either become trapped in the ice or build up as scale inside the machine.

Cube Ice Machines

In a cube ice maker, water from a sump is continuously circulated over an evaporator where it freezes layer by layer until cubes are formed and then released into a storage bin. As the water freezes, most of the dissolved minerals are forced out and become concentrated in the sump water. This water is then purged from the sump, taking with it the dissolved solids that would otherwise form scale. However, this means cube ice machines use more water than required to produce the ice. On average, 18 to 20 gallons are needed to make 100 pounds of ice.

Filtration System Needed			
Flake/Nugget Ice Machines	Capacity (lb./day)	Filtration System Requirements	
		Flow Rate (GPM)	Capacity (Gallons)
Single Machine	1,501 to 2,500	3.34	18,000
	2,501 to 3,500	5.01	36,000
	Up to 3,500	1.67 to 3.5	9,000 to 25,000
	3,501 and up	6.67 to 10.5	50,000 to 283,906
	Up to 5,000	14	100,000
	5,001 and up	7.5	283,906
Multiple Machines	Up to 5,000	10	60,000
	5,001 and up	10	100.000

Filtration System Needed			
Cube Ice Machines	Capacity (lb./day)	Filtration System Requirements	
		Flow Rate (GPM)	Capacity (Gallons)
Single Machine	Less than 650	1.67	9000
	651 to 1,200	2.0 to 3.5	15,000 to 25,000
	1,201 to 1,600	5.01 to 7.0	36,000 to 50,000
	1,601 and up	6.67	48,000
	Up to 2,400	10.5	75,000
	2401 and up	14.0	100,000
Multiple Machines	Up to 2,400	10.0	60,000
	2,401 and up	10.0	100,000

DON'T FORGET THE FILTER

Perhaps the most important and most overlooked component when considering a water treatment system is replacing filter cartridges on a routine basis.

You've helped your customers take their water from ordinary to extraordinary—to help them keep it that way, make sure to stick with Pentair® Everpure® Replacement Filter Cartridges.

WHY PENTAIR® EVERPURE®?

Pentair has set the standard for commercial and foodservice water quality for over 85 years. Today, that standard is the Pentair Everpure line of water filtration and RO systems. Customers across the globe trust Pentair Everpure for:

- Easy, sanitary quick-change filter replacement
- A single-source supplier of foodservice water treatment systems, with the breadth of product to provide right-sized solutions for any size operation
- High-efficiency RO systems that provide significant water savings over conventional RO systems
- Compact, configurable RO systems with capacities from 50 to 880 gallons per day, featuring controlled remineralization or blending valves to achieve the right mineral balance
- Comprehensive water testing services to ensure recommendation of the right system
- Total Water Management to help restaurants and other foodservice operations take their water from ordinary to extraordinary and keep it that way

Visit **foodservice.pentair.com** or call 800.942.1153 for all the support and assistance you need finding the right water treatment system for any hospitality or foodservice operation.