

3M™ High Flow Series Carbonless Filter Systems Toolkit

Covered in this training:

- General benefits of water filtration**

- 3M™ High Flow Series Carbonless Filter Systems**

 - For foodservice and facilities maintenance**

 - For healthcare facilities**

- The science inside**

- Resources and reference materials**

General benefits of water filtration

- ▶ A common cause of water related ice machine service calls are scale related and can lead to service issues and breakdowns.
- ▶ 3M scale inhibitors help reduce scale build up allowing hardness minerals to be purged and flushed down the drain.
- ▶ 3M filtration reduces sediment that can lead to water valves sticking or not opening leading to service calls.
- ▶ Sediment reduction in water can also help reduce the scale build up in equipment – The Snowflake effect, the more sediment in the water the more potential nuclei (scale starting points), the less sediment the better for ice machines.
- ▶ 3M™ High Flow Series Carbonless Filter Systems can help reduce facility service calls and downtime—increasing bottom line profitability.

Introducing 3M™ High Flow Series Carbonless Cartridges

Expansion of “-SR” product family – Carbonless Cartridges (7 new cartridges)

Model	GPM	Scale Inhibition	Sediment Reduction	NSF	Bacteria Retention**	Applications
HF20-S-SR	2	Yes	0.2 Micron Nominal	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Facility/MRO Ice Machines
HF20-A020-S-SR	2	Yes	0.2 Micron Absolute ¹	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Healthcare Ice Machines
HF20-A020-SR	2	No	0.2 Micron Absolute ¹	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Healthcare Drinking Fountains, Soda Fountains, Hand Washing Sinks
HF40-S-SR	2.5	Yes	0.2 Micron Nominal	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Facility/MRO Ice Machines
HF60-A020-S-SR	3.5	Yes	0.2 Micron Absolute ¹	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Healthcare Ice Machines
HF60-S-SR	3.5	Yes	0.2 Micron Nominal	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Facility/MRO Ice Machines
HF90-SR	5	No	0.2 Micron Nominal	Std 42 - Class 1 Particulate Std 53 – Cyst* CSA B483.1 - Class 1 Particulate and Cyst*	Yes	Used as a pre filter for RO or high silt levels and short life

1. Absolute based on 99.998 reduction log.

*Based on testing using *Cryptosporidium parvum* oocysts

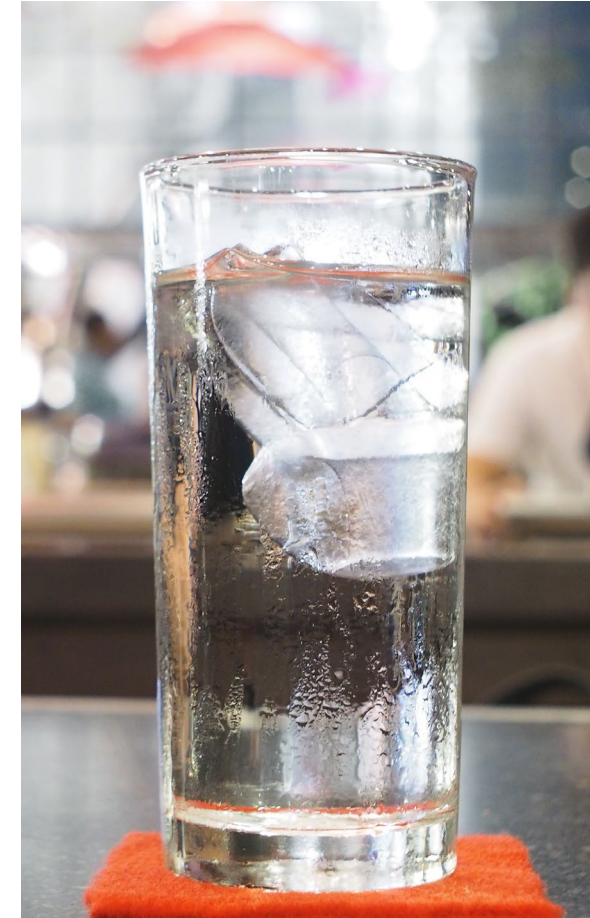
**Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism *E. coli* (ATCC 11229) and *P. fluorescens* (ATCC 49642) in manufacturer's lab test.

Carbonless filtration for foodservice and facilities maintenance

Carbonless filtration for foodservice and facility maintenance

In facilities where breakrooms and cafeterias exist:

- ▶ Businesses continue to see biofilm (slime) inside ice machines.
- ▶ Excess moisture in combination with environmental factors can increase the risk of potential growth and spread of biofilm-associated bacteria making the ice machines a common target for thorough inspections.
- ▶ The environment surrounding the ice machine can impact the performance and service requirements of the ice machines due to biofilm build-up.
- ▶ 3M™ High Flow Series Carbonless Filter Systems are an efficient way to help reduce biofilm build-up in the ice machine. Featuring submicron filtration designed to maintain chlorine and chloramine levels in your incoming municipal water to help reduce potential biofilm growth.
- ▶ Cube style ice machines are commonly used in many facilities. They circulate water over an evaporator plate that freezes the water. Our Carbonless filters are specifically designed to maintain chlorine and chloramines in the water.



Carbonless filtration for foodservice and facility maintenance

Recommended filters for foodservice ice applications (HF20,40,60,90-S-SR series cartridges)

- ▶ Many cafeterias use the cubed style ice machines, vertical evaporator ice machines.
- ▶ Cubed style ice machines can use 100-300 gallons per day depending on the machine and the ice demand.
- ▶ Cubed style ice machines require higher incoming flow rates (1-5 gpm) making them more sensitive to incoming pressure and flow.
- ▶ Frequently plugging ice machine water filters causing low water flow can cause these machines to freeze up, stop working and cause equipment damage, overall increased cost to the location. Because of these water parameters, the absolute micron rated membrane cartridges are not normally recommended in these applications.
- ▶ Nominal cartridges are a great option for this application.
 - It has very low initial pressure drop provide better incoming flow rates even at lower incoming pressures.
 - Very efficient and consistent sediment loading.
 - Multi-zone membrane has high sediment holding capacity.
 - Reduces potential bacteria* in water by up to 99.99% (4 Log) while leaving the chlorine/chloramine in the incoming water helps keep ice machines clean without shortening filter life.

*Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism *E. coli* (ATCC 11229) and *P. fluorescens* (ATCC 49642) in manufacturer's lab test.

3M™ High Flow Series Carbonless Filtration Systems

Features and benefits:

- ▶ Sanitary Quick Change (SQC) encapsulated cartridge design eliminates media contamination during change-outs with a ¼ turn
- ▶ Multi-zone pharmaceutical grade membrane with a 0.2-micron nominal rating
- ▶ Reduction of up to 99.99% of waterborne bacteria¹
- ▶ Built-in scale inhibitor reduces lime scale build-up on evaporator plates as tested by 3M Purification Inc.
- ▶ Certified to NSF Standard 42 for structural integrity and materials safety
- ▶ Certified to NSF Standard 42 for particulate reduction
- ▶ Certified to NSF Standard 53 for cyst reduction²
- ▶ Certified for NSF Standard for CSA B483.1 for particulate and cyst reduction².
- ▶ Bacteria retentive filter system¹
- ▶ Direct or easily-adaptable connections to existing plumbing lines with 3/8" or 1/2" (because there are two head options- VH3 and NH3) FNPT horizontal inlet and outlet ports
- ▶ Smaller filter-sizes come with the option of a proprietary valve-in-head design simultaneously shuts off and vents water, allowing for simple and virtually trouble-free cartridge change-outs without the need to shut off the upstream feed water
- ▶ WQA certified to WQA/ASPE/ANSI S-803 for Sustainability Attributes
- ▶ Components certified by WQA to NSF 372 for low lead compliance

1. Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism *E. coli* (ATCC 11229) and *P. fluorescens* (ATCC 49642) in manufacturer's lab test.

2. Based on testing using *Cryptosporidium parvum* oocysts.



Carbonless filtration for healthcare

Carbonless filtration for healthcare facilities

In healthcare facilities:

- ▶ Healthcare facilities have higher cleanliness and sanitization standards than other industries due to the critical care and safety objectives of their patients.
- ▶ 3M™ High Flow Series Carbonless Filtration Systems are designed to maintain the chlorine/ chloramine levels from the incoming water source, which will stay in the ice machine feed water.
- ▶ One area of focus is a protocol from American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). 3M™ High Flow Carbonless Absolute Series Filters support ASHRAE 188 water management plans.
- ▶ The nugget style ice machine is commonly used in healthcare facilities, preferred by patients and providers for its easy-to-chew ice.
- ▶ Many hospitals have scheduled cleaning and sanitization on ice machine every 3-4 months.



Carbonless filtration for healthcare facilities

- ▶ Some bacteria are becoming more resistant to municipal disinfection methods. Having a water filter with a bacteria retention level this high¹ is an additional step/barrier for bacteria to travel into ice machine. This bacteria retention pharmaceutical grade membrane can help supplement the municipality's disinfection process.
- ▶ The 3M™ High Flow Carbonless Absolute Series filter cartridge is a great technology for this application.
 - It has very low initial pressure drop provide better incoming flow rates even at lower incoming pressures.
 - Very efficient and consistent sediment loading.
 - Multi-zone membrane has high sediment holding capacity.
 - Reduces potential bacteria¹ in water by up to 99.998% while leaving the disinfectant in the incoming water helps in keeping ice machines cleaning without affecting filter life.
 - Utilizing the absolute² series 0.2-micron filtration the water going into equipment will have a very low level of silt, sediment and potential bacteria.

¹ Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism E. coli (ATCC 11229) and P. fluorescens (ATCC 49642) in manufacturer's lab test.

² Absolute based on 99.998 reduction log

Carbonless filtration application

Recommended filters for healthcare ice applications (HF20/60-A020-S-SR series cartridges)

- ▶ The most common style of ice machine in these locations is nugget ice, flooded evaporator with a water dispenser.
- ▶ The main cause of potential growth is from the surrounding environment. The surrounding air and people using ice machines can lead to potential growth.
- ▶ There is not a logical way to try and clean the air in and around the ice machine so the practical way to help slow down this growth is to use carbonless water filtration that leaves the disinfectant the municipality adds to the water.
- ▶ These machines are located in nurses' stations and surgery recovery areas.
- ▶ Larger hospitals also have critical care ice machines that are only for patients who are dealing with serious immune system challenges. These machines are typically located in a separate area.

3M™ High Flow Carbonless Absolute Series Filtration Systems

Features and benefits:

- ▶ Sanitary Quick Change (SQC) encapsulated cartridge design eliminates media contamination during change-outs with a ¼ turn
- ▶ Multi-zone pharmaceutical grade membrane with a 0.2-micron absolute¹ series rating
- ▶ Reduction of up to 99.99% of waterborne bacteria²
- ▶ Reduces sediments, silt and particulates down to 0.2 microns (by 99.998%) that can clog downstream floats, valves and pumps in equipment
- ▶ Built-in scale inhibitor reduces lime scale build-up on evaporator plates as tested by 3M Purification Inc.
- ▶ Certified to NSF Standard 42 for structural integrity and materials safety
- ▶ Certified to NSF Standard 42 for particulate reduction
- ▶ Certified to NSF Standard 53 for cyst reduction³
- ▶ Certified to NSF Standard CSA B483.1 for Particulate reduction and cyst³
- ▶ Bacteria retentive filter system²
- ▶ Direct or easily-adaptable connections to existing plumbing lines with 3/8" or 1/2" FNPT horizontal inlet and outlet ports
- ▶ Smaller filter sizes come with an option of a proprietary valve-in-head design simultaneously shuts off and vents water, allowing for simple and virtually trouble-free cartridge change-outs without the need to shut off the upstream feed water
- ▶ WQA certified to WQA/ASPE/ANSI S-803 for Sustainability Attributes
- ▶ Components certified by WQA to NSF 372 for low lead compliance

¹ Absolute based on 99.998 reduction log

² Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism *E. coli* (ATCC 11229) and *P. fluorescens* (ATCC 49642) in manufacturer's lab test.

³ Based on testing using *Cryptosporidium parvum* oocysts.



Ice machines

Styles of ice machines

Ice model/type

Cubed – vertical evaporator

- ▶ Cuber ice machines produce cleaner, clearer, hard ice. Cubed style machines make ice by pumping water onto/over a vertical evaporate plate.
- ▶ During the freezing process pure water will freeze first. As the pure water freezes the constant flow pushes the impurities/TDS in the water away from the evaporator plate.
- ▶ The freezing process make hard clear cubes leaving the minerals to accumulate and build up in the machine.

Carbonless filtration application

Recommended filters for facility water filtration applications | HF20, 40, 60, 90-S-SR



Most commercial facilities use the cubed style ice machines, vertical evaporator ice machines.

- ▶ Cubed style ice machines can use 100-300 gallons per day depending on the machine or ice demand.
- ▶ Cubed style ice machines require higher incoming flow rates (1-5 gpm) making them more sensitive to incoming pressure and flow.
- ▶ Frequently plugging ice machine water filters causing low water flow can cause these machines to freeze up, stop working and cause equipment damage, overall increased cost to the location
- ▶ These cartridges are a great option for this application.
 - It has very low initial pressure drop provide better incoming flow rates even at lower incoming pressures.
 - Very efficient and consistent sediment loading.
 - Multi-zone membrane has high sediment holding capacity.
 - Reduces potential bacteria¹ in water by up to 99.99% (4 Log) while leaving the disinfectant in the incoming water helps keep ice machines clean without shortening filter life.

¹ Reduction of water-borne bacteria as demonstrated with 99.99% reduction of surrogate organism *E. coli* (ATCC 11229) and *P. fluorescens* (ATCC 49642) in manufacturer's lab test

Styles of ice machines

Ice model/types

Flaked, nugget/chewable/cublet, chipped or scale ice – flooded evaporator

- ▶ Flooded evaporator ice machines can produce many different styles and shapes of Ice. This ice is a soft ice (70-85% ice/30-15% water) that is not clear and hard when made.
- ▶ The ice contains the same impurities/TDS/minerals of the water coming into the machine – What comes into the machine is what comes out of the machine.
- ▶ The purge/dump cycle (if used) typically only flushes a little water after a machine turns off which has limited effect on improving water quality inside the machine when it is producing ice

Carbonless filtration application

Recommended for healthcare applications | HF20/60-A020-S-SR series



The most common style of ice machine in these locations is nugget ice, flooded evaporator with a water dispenser.

- ▶ The main cause of potential growth is from the surrounding environment. The surrounding air and people using ice machines can lead to potential growth.
- ▶ There is not a logical way to try and clean the air in and around the ice machine so the practical way to help slow down this growth is to use carbonless water filtration that leaves the disinfectant the municipality adds to the water.
- ▶ These machines are typically located in nurses' stations and surgery recovery areas.
- ▶ Larger hospitals also have critical care ice machines that are only for patients who are dealing with serious immune system challenges. These machines are typically located in a separate area.

The science inside

Absolute vs Nominal

Definition of common water terms:

Nominal

- Rating of a filter that will capture 85% of the particles of a specified size (in microns) and larger
- A filter rated a 1 micron nominal will capture 85% of particles that are 1 micron or larger

Absolute

- Rating of a filter that will capture 99.9% of particles of a specified size (in microns) and larger
- A filter rated at 1 micron absolute will capture 99.9% of all particles 1 micron or larger

Filtration/disinfection technologies

The most common types of microorganisms in water include bacteria, parasites (cysts) and viruses

- ▶ **Bacteria:** Coliform bacteria are the most common type of bacteria for which water is tested. They are found naturally in the intestines of humans and animals. Although some forms can be infectious, such as fecal coliform, most are not considered to be disease-causing. However, their presence in drinking water indicates that conditions exist that would allow other potentially harmful types of bacteria to be present as well. Microscopic in size, between 0.2 and 10 microns.
- ▶ If a coliform test is negative, this generally indicates that the microbiological quality of the water is considered to be good. If coliform is detected, additional testing is usually performed to determine if other types of bacteria are present, like fecal coliform or *E. coli*.

Our 3M™ High Flow Carbonless Series Filters are designed to maintain chlorine levels present in your incoming water while providing critical protection from protozoan cysts² and scale damage in your ice-machines. This series offers flow rates from 2 gpm (7,57 lpm) to 3.5 gpm (13,25 lpm) at 0.2 absolute micron ratings.¹

1. Absolute micron rating based on 99.998% log reduction.
2.. Based on testing using *Cryptosporidium parvum* oocysts.

Other filtration/disinfection technologies

Reduction methodologies (general concepts):

1. **Boiling water** for at least two to three minutes once it reaches a good rolling boil will destroy all three types of organisms: bacteria, parasites (cysts) and viruses.
2. **Ultraviolet light** can be used to disinfect drinking water. UV systems certified to NSF/ANSI Std 55 – Class A can be used to disinfect water containing bacteria, viruses and some cysts.
3. **Chemical/Filtration**, such as chlorine, can be used to disinfect water supplies containing bacteria or viruses. A filter certified for cyst reduction can also be installed for protection against cysts.

NSF Consumer Fact Sheet – www.nsf.org

Resources and reference materials

Resources

Marketing Collateral | Specification Sheet 080

<https://multimedia.3m.com/mws/media/1858907O/3m-high-flow-carbonless-series-water-filtration-products-080-spec-sheet.pdf>

Marketing Collateral | Specification Sheet 020

<https://multimedia.3m.com/mws/media/1858908O/3m-high-flow-carbonless-absolute-series-water-filtration-products-spec-sheet.pdf>

Marketing Collateral | Sizing Guide

<https://multimedia.3m.com/mws/media/1873774O/3mtm-high-flow-filter-sizing-guide.pdf>

Marketing Collateral | Installation Manual

<https://multimedia.3m.com/mws/media/1870757O/3m-high-flow-series-installation-manual-for-single-cartridges.pdf>

Marketing Collateral | Performance Data Sheets

<https://multimedia.3m.com/mws/media/1870758O/3m-high-flow-performance-data-sheets.pdf>

3M™ High Flow Carbonless Series

Model Number	3M Global ID	Product Description	Micron	Product Status
HF25-S-SR	7100090355	5615240 WF CTG HF25-S-SR A3	Nominal	Existing product
HF45-S-SR	7010314367	5613346 WF CTG HF45-S-SR A3	Nominal	Existing product
HF65-S-SR	7010340307	5613453 WF CTG HF65-S-SR A3	Nominal	Existing product
HF95-S-SR	7010382785	5613527 WF CTG HF95-S-SR A3	Nominal	Existing product
HF20-A020-S-SR	7100230303	5636431 WF CTG HF20-A020-S-SR	Absolute	New product
HF60-A020-S-SR	7100230264	5637225 WF CTG HF60-A020-S-SR	Absolute	New product
ICE120-A020-S-SR	7100230292	5616015 WF SYS ICE120-A020-S-SR	Absolute	New product
ICE160-A020-S-SR	7100230267	5616335 WF SYS ICE160-A020-S-SR	Absolute	New product
HF20-A020-SR	7100230265	5636433 WF CTG HR20-A020-SR	Absolute	New product
HF90-S-SR	7100053657	5617105 WATER FILTER CTG HR90-S-SR	Nominal	Existing product
HF20-S-SR	7100231505	5636432 WF CTG HF20-S-SR	Nominal	New product
HF40-S-SR	7100231284	5637115 WF CTG HF40-S-SR	Nominal	New product
HF60-S-SR	7100230268	5637226 WF CTG HF60-S-SR	Nominal	New product
ICE120-S-SR	7100230304	5616016 WF SYS ICE120-S-SR	Nominal	New product
ICE160-S-SR	7100232991	5616336 WF SYS ICE160-S-SR	Nominal	New product
HF90-SR	7100230266	5637315 WF CTG HF90-SR	Nominal	New product