

FILTERSORB® RANGE · SALT-FREE SCALE PREVENTION

ICE AS TOUGH AS THE PLAYERS.

FILTERSORB® SP3

WATER PREPARATION FOR ICE HOCKEY ARENAS



FOR IMPROVED ICE CLARITY

Install Catalytic Carbon before FILTERSORB® SP3

WATER SUPPLY

CATALYTIC CARBON

FILTERSORB® SP3

ICE-MAKING WATER



**WATCH WATER
REPORTS**



**2 MILLION SYSTEMS
IN OPERATION**



**NO CUSTOMER
COMPLAINTS REPORTED**

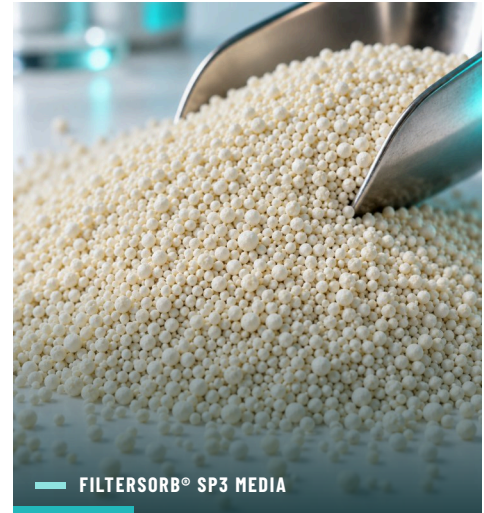
01 / WHAT FILTERSORB® SP3 CONTRIBUTES

TWO MILLION SYSTEMS IN OPERATION. NO CUSTOMER COMPLAINTS REPORTED.

Water preparation is an important part of producing consistent hockey ice. Watch Water applies its experience in mineral crystallization and carbonate scale control to arena water preparation. Published rink research and operating case studies show why water composition and treatment deserve attention alongside refrigeration and resurfacing practice.¹⁻⁵

Two million FILTERSORB® SP3 systems are in operation, with no customer complaints reported. This operating record is central to our confidence in the technology.⁶

FILTERSORB® SP3 uses Nucleation Assisted Crystallization (NAC) to promote microscopic calcium carbonate crystals, including aragonite. These stable crystals remain suspended in the water, helping prevent carbonate deposits on equipment. The process operates without sodium exchange or regeneration brine.¹

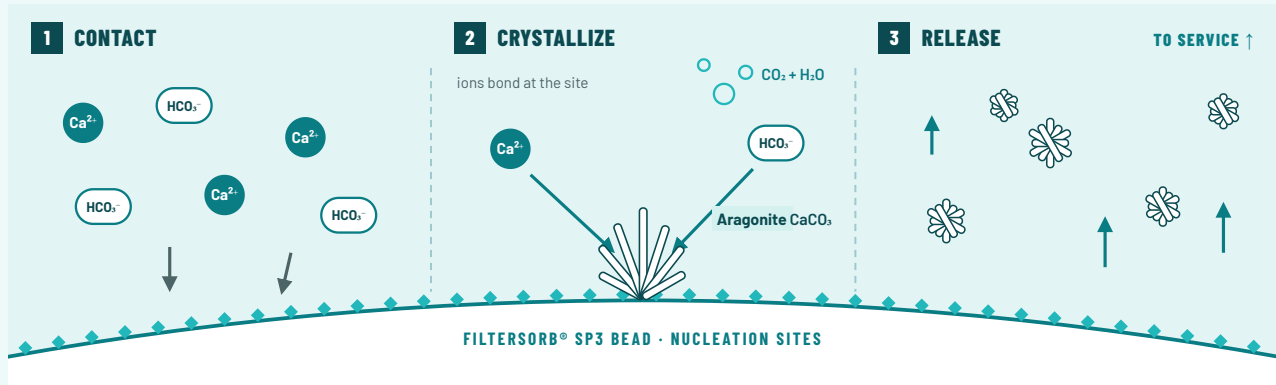


NAC PROCESS

NO SODIUM EXCHANGE

NO REGENERATION BRINE

HOW IT WORKS · NAC: NUCLEATION ASSISTED CRYSTALLIZATION



1 CONTACT. Hard water flows upward through the bed and meets catalytic nucleation sites on the bead surface.

2 CRYSTALLIZE. Dissolved calcium bicarbonate converts into sub-micron aragonite CaCO₃ crystals. Typical reaction time is around 5 seconds.

3 RELEASE. The stable aragonite crystals detach and travel with the water. They do not adhere to pipes, heaters or heat exchangers, even in hot water.



Aragonite is a crystalline form of calcium carbonate. Directing carbonate crystallization into suspended microcrystals is the foundation of our scale-prevention approach and the starting point for arena applications.¹

“SP3” stands for Scale Prevention into 3 components: CaCO₃ micro-crystals, CO₂ and H₂O.

SOURCES 1 Watch Water, FILTERSORB® SP3 product description and working principle 2 Hutchins, Wang and Impellizzeri (2026), Sports Engineering 29 3 Southern California Edison (2010), Report ET09SCE1070 4 FortisBC, Ice rink resurfacing efficiency pilot 5 Municipal Climate Change Action Centre, Carstairs Memorial Arena (2021) 6 Watch Water GmbH, company operating record

02 / WHAT CONTROLLED ICE RESEARCH SHOWS

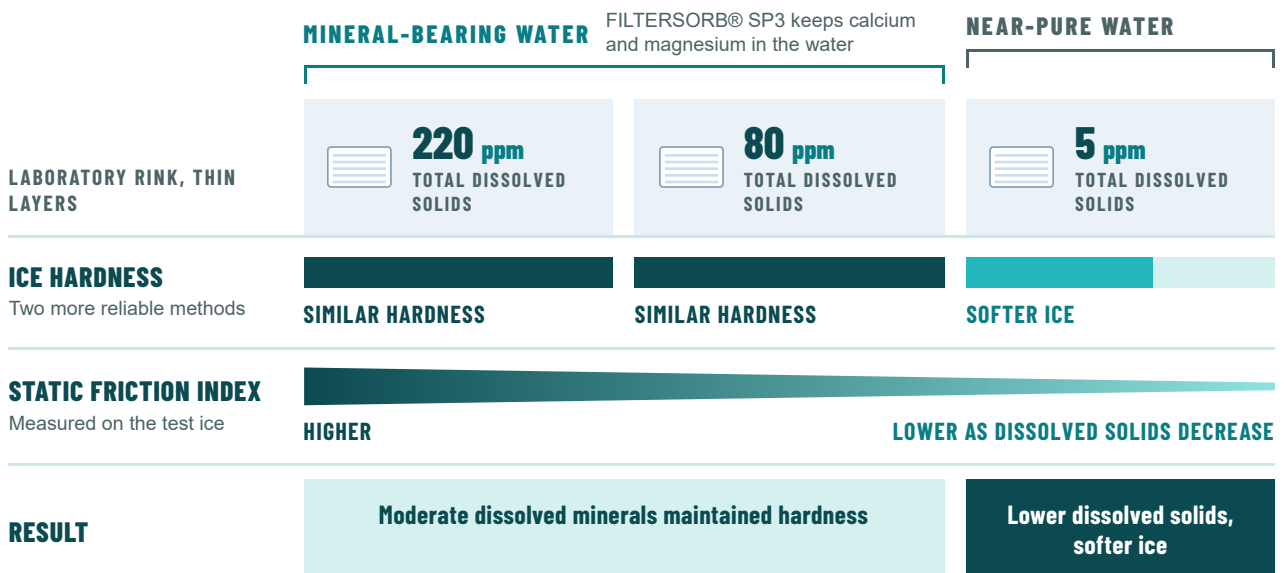
MINERAL CONTENT SHAPES THE ICE.

A 2026 laboratory rink study links dissolved solids to ice hardness and skate-to-ice friction.



A 2026 study by Hutchins, Wang and Impellizzeri compared water containing 220, 80 and 5 ppm total dissolved solids on a laboratory rink constructed in thin layers. The 80 and 220 ppm waters produced similar hardness, while 5 ppm water produced softer ice with the two more reliable hardness methods. Lower dissolved solids also reduced the measured static friction index.²

STUDY RESULTS AT A GLANCE



CONTROLLED ICE TESTING

WHAT THIS MEANS FOR HOCKEY ICE

These findings support careful mineral management for hockey ice. Under the study conditions, moderate dissolved mineral content maintained hardness while lower dissolved solids reduced static friction. The practical objective is a consistent skating surface supported by appropriate water composition, temperature and freezing practice.²

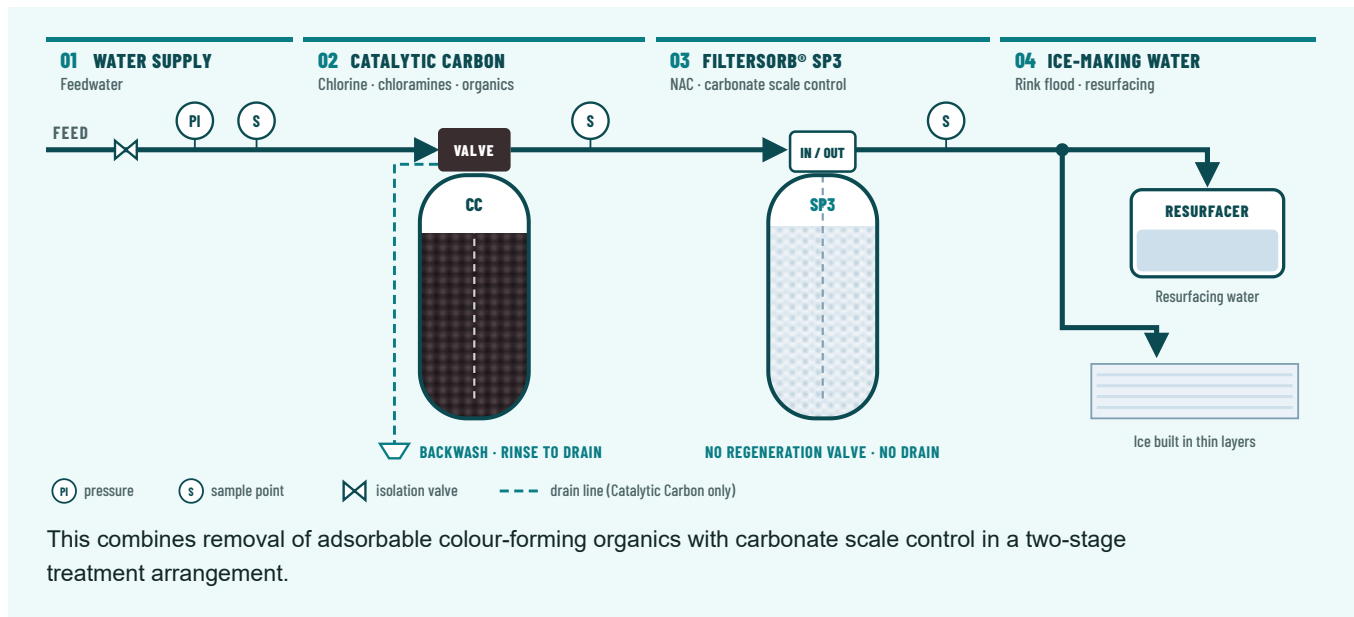
WHERE FILTERSORB® SP3 FITS

SP3 keeps calcium and magnesium in the treated water while controlling carbonate scale.

03 / RECOMMENDED TREATMENT FOR CLEARER ICE

CATALYTIC CARBON FIRST. FILTERSORB® SP3 SECOND.

For improved ice clarity, Watch Water recommends installing Catalytic Carbon upstream of FILTERSORB® SP3.



CATALYTIC CARBON BEFORE SP3

Catalytic Carbon targets chlorine, chloramines and adsorbable organic compounds, including tannins and humic substances associated with water colour. Reducing these colour-forming substances can support clearer ice when they are present in the feedwater. FILTERSORB® SP3 then provides the carbonate crystallization stage.⁷

CHLORINE

CHLORAMINES

TANNINS

HUMIC SUBSTANCES

INSTALL AND COMMISSION

- 01** Install the media in separate vessels, with Catalytic Carbon first and SP3 second.
- 02** Commission and rinse the carbon stage until the outlet runs clear.
- 03** Direct water to SP3 and the ice-making supply. This prepares the carbon bed for clean-water service.⁷



04 / TECHNICAL DATA AND SYSTEM DESIGN

UPFLOW DESIGN. NOTHING TO REGENERATE.

THE ORIGINAL NAC MEDIA FOR SALT-FREE SCALE PREVENTION

0

Salt, wastewater or
electricity

5-7 years

Typical media life

333 BV/h

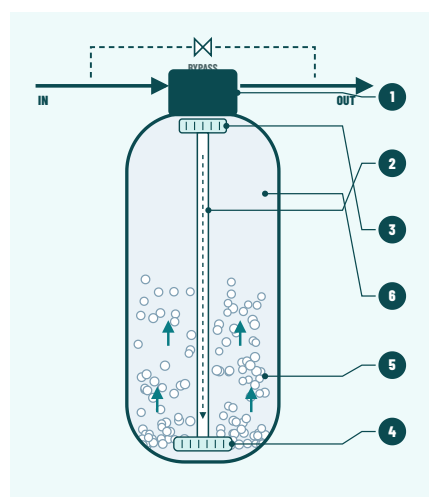
Design loading in upflow

PHYSICAL PROPERTIES	VALUE
Appearance	White / opaque granules
Composition	Modified ceramic beads, double-layer coated (3rd generation)
Bulk density	780 kg/m ³
Particle size	0.55–0.75 mm (20 × 35 mesh)
Moisture content	10–25 %

PROVEN SINCE 2005

- ✓ NSF/ANSI/CAN 61 & 372 certified
- ✓ Calcium and magnesium preserved, no sodium added
- ✓ TDS and pH essentially unchanged
- ✓ Helps gradually reduce existing scale deposits over time

OPERATING CONDITIONS	VALUE
Flow direction	Upflow
Temperature	5–90 °C
pH range	6.5–9.5
Carbonate hardness	max. 1,400 mg/L
Salinity	max. 35,000 mg/L
Iron	max. 0.5 mg/L
Manganese	max. 0.05 mg/L
Free chlorine	max. 3 mg/L
Copper	max. 1.3 mg/L
Oil and H ₂ S	Must be absent



SYSTEM COMPONENTS

- 1 WATCH IN/OUT HEAD**
Inlet and outlet with integrated bypass
- 2 RISER TUBE**
Carries raw water to the vessel bottom
- 3 TOP DISTRIBUTOR**
0.2 mm slots retain the media
- 4 BOTTOM DISTRIBUTOR**
Distributes the upflow
- 5 FILTERSORB® SP3 MEDIA**
Fluidised during service
- 6 FREE SPACE**
Room for bed fluidisation

SYSTEM DESIGN	VALUE
Flow direction	Upflow, the reverse of a conventional softener
Design loading	333 BV/h
Vessel volume	4 to 6 × media volume
Utilities	No backwash, no drain line, no electricity
Service	Bypass recommended; media replacement every 5–7 years



Pretreatment. Pretreatment for sediment, iron, manganese, H₂S, hydrocarbons and copper may be required. In new installations with copper pipe, start after six weeks of water use. Do not use on microbiologically unsafe water or water of unknown quality without adequate disinfection before or after the unit.

05 / BENEFITS OF FILTERSORB® SP3

TEN PRACTICAL BENEFITS OF THE SP3 STAGE.

The SP3 stage offers the following practical advantages.⁸



01 CARBONATE SCALE PREVENTION

Helps protect water-fed equipment from hard mineral deposits.



02 CONTROLLED ARAGONITE FORMATION

Promotes suspended calcium carbonate microcrystals through Nucleation Assisted Crystallization.



03 MINERAL RETENTION

Keeps calcium and magnesium in the treated water.



04 NO SODIUM EXCHANGE

Avoids adding sodium through a conventional softening process.



05 NO SALT REPLENISHMENT

Eliminates routine salt purchasing, storage and handling for the SP3 stage.



06 NO REGENERATION CYCLE

Avoids regeneration chemicals and interruptions associated with regenerating the SP3 medium.



07 NO REGENERATION WASTEWATER

Eliminates brine discharge from the SP3 treatment stage.



08 NO ROUTINE SP3 BACKWASHING

Reduces water use and routine operating tasks.



09 NO ELECTRICAL SUPPLY FOR THE MEDIA PROCESS

Uses the available water flow through the treatment vessel.



10 SIMPLE INSTALLATION AND LONG SERVICE

No regeneration control valve or drain is needed for SP3; typical media life is 5–7 years, depending on operating conditions.

5–7 years

Typical SP3 media life, depending on operating conditions

No salt · No brine

No salt replenishment and no regeneration wastewater for the SP3 stage

No electricity

No electrical supply needed for the media process

These operating benefits apply to the SP3 stage. The upstream Catalytic Carbon vessel has its own backwashing and servicing schedule.^{7,8}

SOURCES 7 Watch Water, Catalytic Carbon product information · 8 Watch Water, FILTERSORB® SP3 brochure

06 / EVIDENCE FROM OPERATING ICE ARENAS

PREPARED WATER. DOCUMENTED AT THE RINK.

Published arena cases document experience with vortex water conditioning and provide industry context for the role of treated water in ice production.



COMMUNITY ICE ARENA

CHANNEL ISLANDS ICE CENTER · OXNARD, CALIFORNIA

SOUTHERN CALIFORNIA EDISON, 2010

4.6%

Estimated annual electricity savings at the site

Rebound

Readings maintained or improved, with better uniformity

In its December 2010 assessment, Southern California Edison found that comparative ice-surface rebound readings were maintained or improved after treatment, with better uniformity. The report estimated annual electricity savings of 4.6% at the site, associated with the treatment and revised operating conditions.³



RINK REFRIGERATION PLANT

TEN RINKS · BRITISH COLUMBIA

FORTISBC RESURFACING PILOT

10 rinks

In the utility program

90%

Of participants would continue using the technology

FortisBC's program involved ten rinks in British Columbia. Its summary reports improved ice quality and reduced demand on compressors and water heating when vortex de-aeration enabled lower-temperature resurfacing water.⁴



MUNICIPAL ARENA

CARSTAIRS MEMORIAL ARENA · ALBERTA

RETROFIT PROJECT, 2021

25,438 kWh

Projected annual electricity savings

195 GJ

Projected annual natural gas savings

A 2021 retrofit profile lists these projected annual savings. The project illustrates the operational interest in preparing water for resurfacing at lower temperatures.⁵

MINERAL CRYSTAL STRUCTURE IS PART OF THE DISCUSSION

The SCE report records the manufacturer's explanation involving calcite-to-aragonite conversion. This places mineral crystal structure within the industry's discussion of rink-water preparation. Its comparative ice tests provide a useful example of assessing surface consistency during actual arena operation.³

07 / THE SP3 APPROACH FOR ARENAS

SCALE CONTROL WITHOUT SALT OR BRINE.

For arena operators and specialist distributors.

PRACTICAL BENEFITS OF THE SP3 APPROACH

For arena operators and specialist distributors, SP3 offers carbonate scale control without salt replenishment or regeneration brine, supporting the maintenance of water-fed equipment.¹

Carbon dioxide participates in the bicarbonate-carbonate balance. The reaction accompanying calcium carbonate crystallization helps explain the chemistry of the SP3 process.¹



THE OPPORTUNITY FOR ARENA WATER PREPARATION

Our experience with FILTERSORB® SP3 provides the foundation for discussions with the ice-arena industry. The combination of a substantial installed base, controlled carbonate crystallization and interest in mineral management creates a clear opportunity for collaboration with experienced arena-water specialists.

We bring our expertise in scale prevention and aragonite crystal formation to that discussion.^{1,6}

FROM WATER ANALYSIS TO ICE

01 WATER ANALYSIS

Hardness, alkalinity, total dissolved solids, colour, chlorine and chloramines.

02 WATER DEMAND

Daily ice-making and resurfacing volumes and peak flow.

03 SYSTEM DESIGN

Catalytic Carbon and FILTERSORB® SP3 vessels sized for the arena.

04 COMMISSIONING

Carbon stage rinsed until clear, then SP3 placed in service.



— WATER ANALYSIS AT THE RINK

CONTACT

LET'S PREPARE WATER FOR BETTER ICE

Send us your water analysis and ice-making water demand. We will recommend the Catalytic Carbon and FILTERSORB® SP3 arrangement for your arena.

INFO@WATCHWATER.DE

WWW.WATCHWATER.DE

08 / FILTERSORB® SP3 AT A GLANCE

PROPERTY	FILTERSORB® SP3
Process	Nucleation Assisted Crystallization (NAC)
Function	Carbonate scale prevention through suspended calcium carbonate microcrystals, including aragonite
Minerals	Calcium and magnesium retained in the treated water
Sodium	No sodium exchange
Salt and brine	No salt replenishment, no regeneration wastewater
Regeneration	No regeneration cycle, control valve or drain
Backwashing	No routine SP3 backwashing
Electricity	No electrical supply for the media process
Pre-treatment	Catalytic Carbon upstream for improved ice clarity
Media life	Typically 5–7 years, depending on operating conditions
Installed base	Two million systems in operation



ARENA-READY ICE

REFERENCES

- 1 Watch Water GmbH. FILTERSORB® SP3 product description and working principle.
<https://www.watchwater.de/filtersorb-sp3/>
- 2 Hutchins RHS, Wang J, Impellizzeri S. Effect of water quality on ice hardness and skate-to-ice friction in ice rinks. Sports Engineering 29, article 7 (2026).
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- 3 Southern California Edison. Ice Rink Water Treatment System Assessment. Report ET09SCE1070, December 2010.
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- 4 FortisBC. Pilot successes: ice rink resurfacing efficiency pilot.
<https://www.fortisbc.com/rebates-and-energy-savings/test-new-technologies-and-get-incentives/pilot-successes>
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mccac.ca · Success stories
- 6 Watch Water GmbH. Management statement: operating record of two million FILTERSORB® SP3 systems without customer complaints.
- 7 Watch Water GmbH. Catalytic Carbon product description and commissioning guidance.
<https://www.watchwater.de/granulated-activated-carbon-catalytic-carbon-water>
- 8 Watch Water GmbH. FILTERSORB® SP3 brochure: scale-control chemistry, operating benefits and typical media life.
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