

nextTM



Template Assisted Crystallization

A No Salt, No Chemical, Non-
Backwashing, Zero-Discharge
Alternative to Softening

Technology Breakthrough

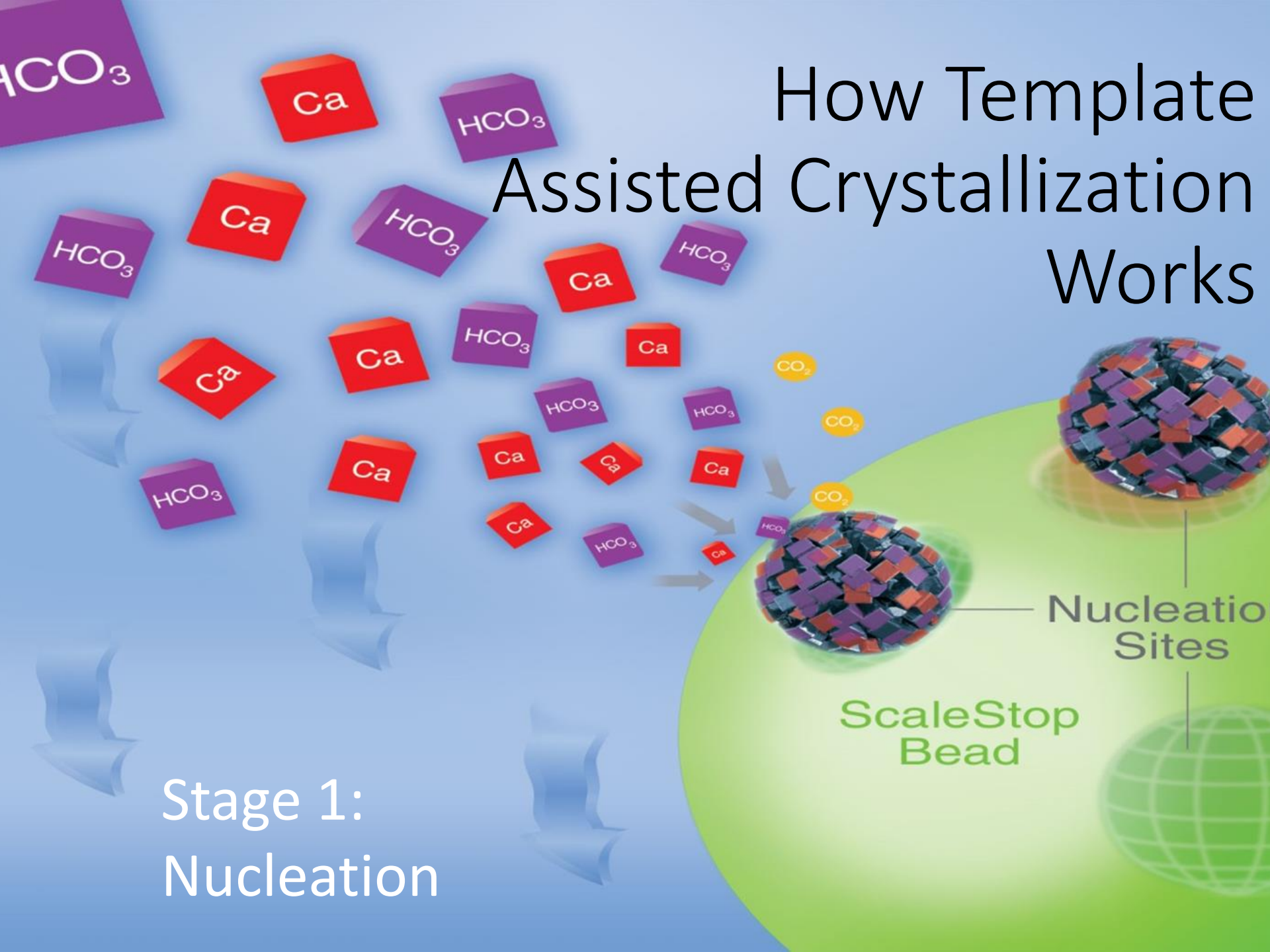
Recently recognized as a new technology, Template Assisted Crystallization (TAC) offers the first proven effective *and* consistent chemical-free scale prevention method.



technology converts hardness minerals into harmless, inactive microscopic crystals.

TAC – **Registered Trademark**

How Template Assisted Crystallization Works

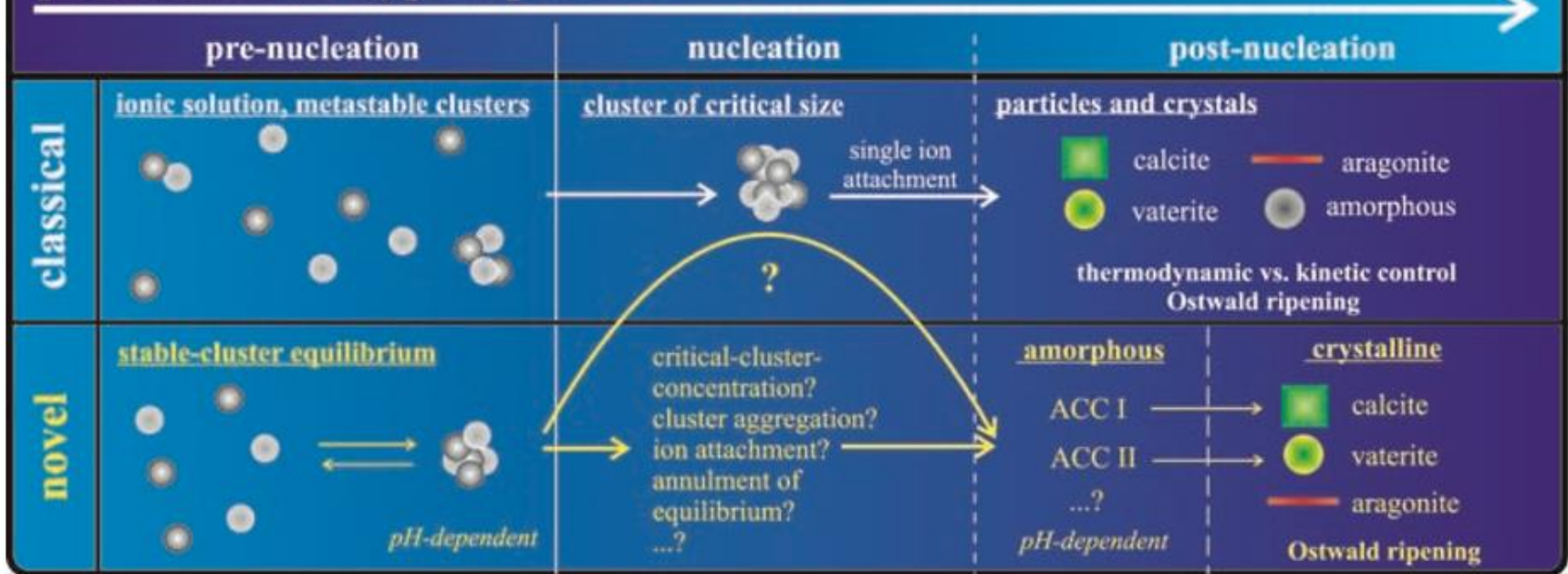


Stage 1:
Nucleation

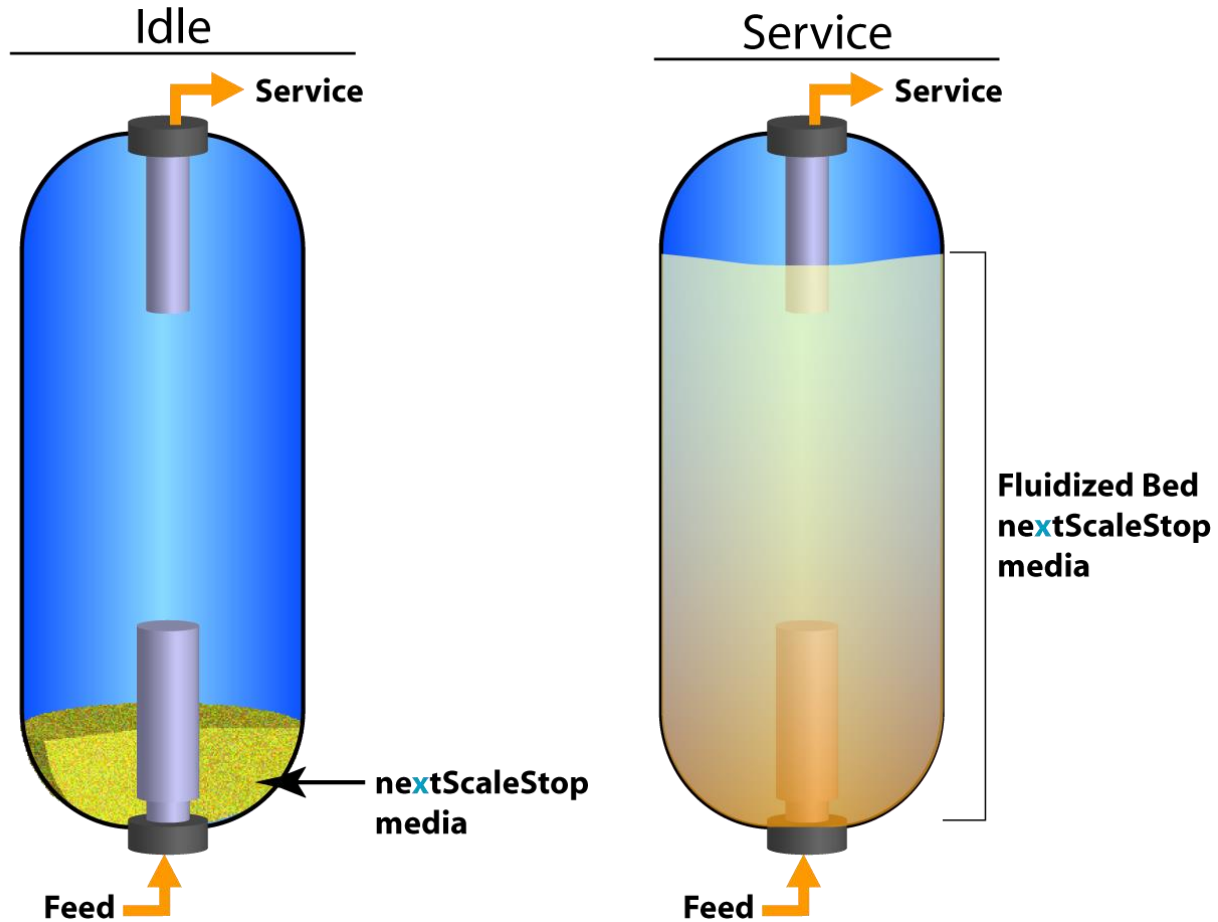
ScaleStop
Bead

Nucleation
Sites

process of CaCO_3 precipitation



nextScaleStop System Cutaway



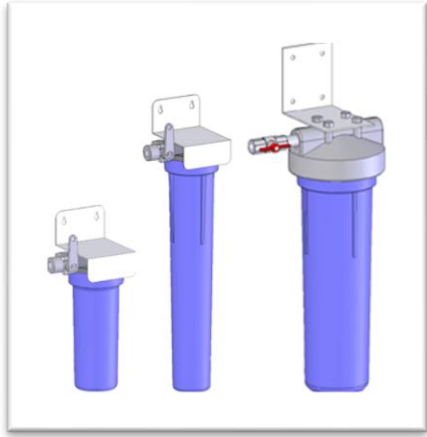
nextScaleStop Advantages

- Consistent scale control performance
 - No salt or chemicals required
- Residential and commercial applications
 - Economical and efficient
 - Maintenance free
 - Retains “Beneficial Minerals”
 - No discharge
 - Compact

Food Service

- Convection Steamers and Combi-ovens
- Flash Steamers – Easier to clean only.
 - Proofer Ovens
 - Coffee Brewers
 - Espresso Machines
 - Post Mix
- Dishwashers – Chemical compatibility

Cartridge Type POU Systems

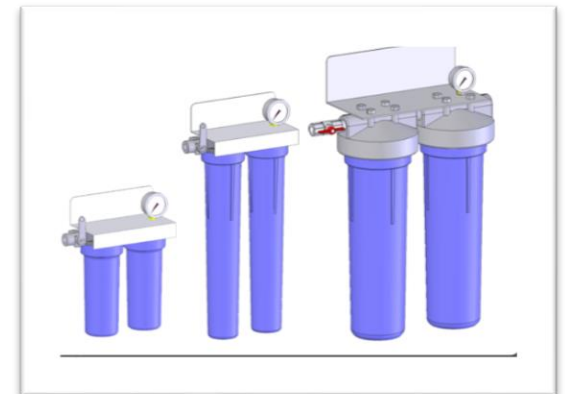


ScaleStop Only

(1, 2 & 4 GPM systems 4-16 l/m)

ScaleStop and Carbon Systems

(1, 2 & 4 GPM systems 4-16 l/m)



Residential Customer Benefits

- Piping systems – scale prevention
- Boilers and Tankless water heaters - scale prevention
 - Solar heating systems – scale prevention
 - Irrigation system spray head – scale prevention
 - Humidifier / evaporator – scale prevention
 - Misting systems – scale prevention
- Better taste and no odor – high quality carbon.
- No slippery feeling – personal choice and elderly safety.

All translate to longer life for equipment, greater energy efficiency and good environmental stewardship.

Commercial, Hospitality and Agricultural POE Water Treatment

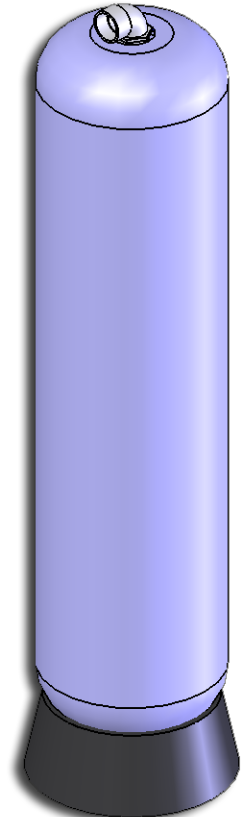
- Piping systems – scale prevention
 - Boilers - scale prevention
- Cooling towers – scale prevention
- Tankless water heaters – scale prevention
- Solar heating systems – scale prevention
- Injection molding equipment – scale prevention
- Distiller heating chamber – scale prevention
- Irrigation system spray head – scale prevention
- Humidifier / evaporator – scale prevention
 - Misting systems – scale prevention

Tank Type POE Systems

Size	Service Flow
NSS 744	10 gpm 38 lpm
NSS 844	12 gpm 45 lpm
NSS 948	16 gpm 60 lpm
NSS 1054	20 gpm 75 lpm
NSS 1252	30 gpm 110 lpm
NSS 1465	50 gpm 190 lpm
NSS 1665	75 gpm 280 lpm



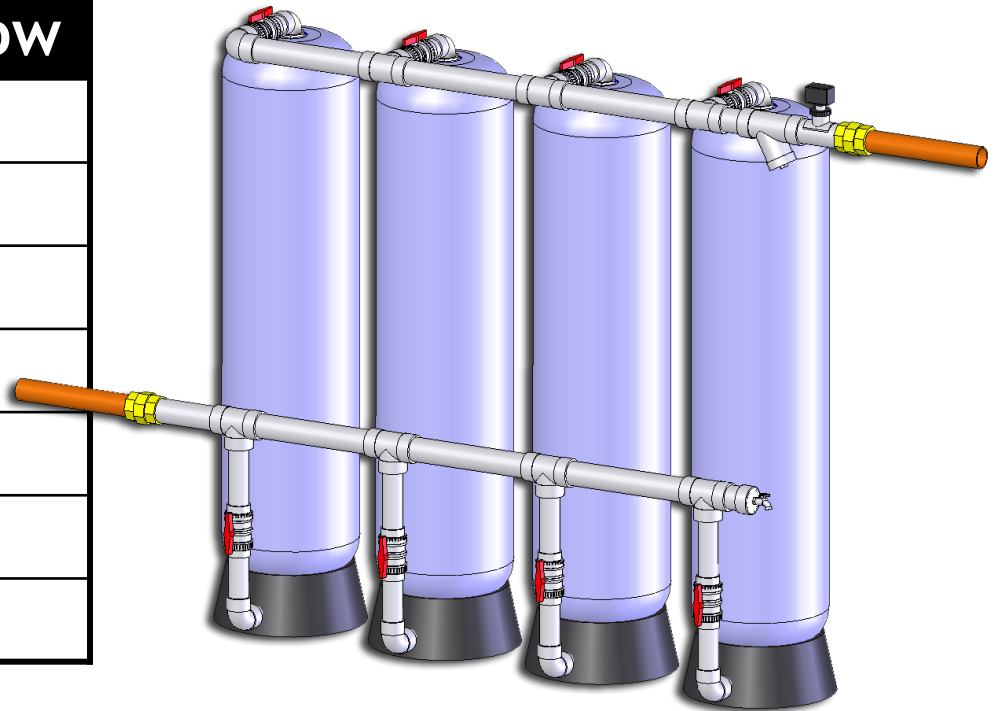
NSS 1054



NSS 1665

High Flow POE Systems

Size	Service Flow
NSS 2x1465	100 gpm
NSS 2x1665	150 gpm
NSS 3x1665	225 gpm
NSS 5x1465	250 gpm
NSS 4x1665	300 gpm
NSS 5x1665	375 gpm
NSS 6x1665	450 gpm





Case Studies

Restaurant Equipment

Concordia Espresso Machines

Background	
Location	Lombard, IL and Tucson, AZ.
Hardness	High
Water Usage	Low
Equip. History	Cuno systems with WAC H form resin prevented scale but caused corrosion/pitting of solenoid valve.
ScaleStop Data	
Inspected @ 6 months and 12 months.	No scale accumulation. No Corrosion
Other:	Concordia is now private-labeling ScaleStop and providing it with all of their equipment



Restaurant Equipment

Groen Combi-oven, Model HY12YE

Background	
Location	Sheraton-Albuquerque Convention Center
Hardness	35 grain/gal 600ppm
Water Usage	Approx. 200 gpd 750 l/d
Equip. History	Chemical de-scaling required every 3-4 weeks. Annual boiler replacement.
ScaleStop Data	
Inspected @ 9 months	No scale accumulation. Boiler operating perfectly.
11 months.	Water level probe coated with crystals causing probe malfunction. The crystals were removed by wiping with a rag. Five minutes service time. 5 years consistent performance.
Other:	The service company involved calls ScaleStop the "Miracle Filter". They are now installing ScaleStop on all of their equipment.



Tankless Water Heaters

Bradford White/ Rinnai 199,000 BTU Commercial

Background	
Location	Middleville, MI
Hardness	28 –31 grain/gal 500 ppm
Water Usage	Approx. 200 gpd 750 l/d ASHRAE Protocol 4 people
Equip. Settings	2 Systems set at 190 degrees to accelerate testing. One Treated, one Control
Test Data	
Control unit	Drop in efficiency noticeable after one week. Complete system shut down due to scale at 2 weeks.
3 Months	Second Control unit fails after 2 weeks. ScaleStop treated system shows no measurable efficiency loss.
Ten Months	After second control unit failed in the same time period as the first. No further controls were tested. The ScaleStop protected remained operating and efficient for 10 full months in this very demanding test (22 times longer than the control).



interior



exterior

Reverse Osmosis

Pretreatment, El Cajon, CA

Background	
Location	El Cajon, California
Hardness/TDS LSI/Stiff Davis	15 grain / 485 mg/l .33 / .66
RO Config	6 - 4040 elements - 45% recovery Model # RO10800G-FL
Equip. History	Installed May 2006. Produces 5000 gallons of permeate per day - 18.9M ³
ScaleStop Technology Data, Dec 2006	
Permeate TDS	6 ppm, (98.7 % rejection)
Permeate Flow	6 gpm 23l/m unchanged from start- up



Hotel Case Study-1

Embassy Suites Hotel

Background	
Location	Tempe, AZ
Hardness	12 grains 205ppm
Problem	Constant scale buildup led to regular boiler failures, inconvenient downtime and expensive service requirements.
Solution	The domestic hot water supply has been treated with ScaleStop for the past 6 years



Hotel Case Study

Embassy Suites Hotel Continued

DCT-06-2006 13:32 From:MC SERVICE 0055793405 To:408 3564088 P.1/1

ARIZONA BOILER CO., INC.
6282 N. 75th AVE.
PEORIA, ARIZONA 85345
(623) 979-3303
(623) 979-3666 FAX

EMBASSY SUITES
ATTN: ACCOUNTS PAYABLE
4400 S. RURAL RD.
TEMPE, AZ 85282

INVOICE

DATE	NUMBER
04/19/06	0615748-IN

CUSTOMER ACCT# E550
INVOICE DUE 5/19/2006
FOR JOB Q610
JOB LOCATION
PURCHASE ORDER # GREGG JOSEY

OUR TERMS ARE 30 DAYS ON ALL OPEN ACCOUNTS.
All other invoices are due upon receipt.

received
4-22-06

Quality Service From Arizona's Largest Since 1960

DESCRIPTION	QUANTITY	PRICE	UNIT	GROSS AMOUNT
TOTAL CONTRACT	0.00	625.400	EA	625.40

OUR SERVICE TECHS REMOVED HEADS & O RINGS FROM RBT 8800 SERIES BOILER. THEY INSPECTED THE TUBES FOR ANY SIGNS OF WATER CORROSION OR SCALE BUILD UP. FOUND TUBES TO BE IN EXCELLENT CONDITION WITH NO SCALE BUILD UP. REPLACED O RINGS WITH NEW RBT8800 O RING KIT. RE-INSTALLED HEADS & PIPING. TURNED BOILER ON, CHECKED FOR ANY SIGNS OF LEAKING. NO LEAKS FOUND, BOILER IN OPERATION, TAXES INCLUDED IN QUOTE.

PLEASE REMIT TO: 6282 N. 75th AVE. PEORIA, AZ 85345

PLEASE READ IMPORTANT INFORMATION: Past due invoices are subject to a service charge of 1.5% monthly/18% per annum. We reserve the right to collect any fees from the customer which may be charged to our company by a collection agency or attorney. You are liable for all sales taxes on this invoice unless we have an exemption form from you.

RETURN POLICY: Shipping is non-refundable, in stock items are refundable at a 25% restocking fee. Special order parts are non-refundable.

Shop Online @ www.azboiler.com

INVOICE TOTALS

GROSS:	625.40
RETENTION:	0.00
TAX:	0.00
TOTAL DUE	625.40

Boiler Inspection

After 9 months of continuous operation and no service, the chief engineer had the boiler tubes inspected.

Quote from service company. "Boiler tubes were spotless, 100% free from any scale deposits."

Boiler inspector said, "it would not be possible for tubes to be this clean if not for a water softener."

Obviously, it is not a softener, but it did effectively eliminate this scale problem.

Hotel Case Study

Embassy Suites, 205 Rooms

Background	
Location	Napa, CA
Hardness	5 grains 86ppm
Problem	Water Softener, Hot only, failed. Needed Replacement.
Test Info	Decided to install economical Next-ScaleStop on domestic water supply. After just 2 months, Chief engineer said that old calcium scale deposits in guest room sinks and faucets were dissolving and for first time remaining clean.



Hotel Case Study

Embassy Suites, 205 Rooms Continued

Paul Rieger Company
 Three Generations of Service
 Contractor's License No. 620477
 1288 Park Pacific Avenue
 Pacifica, CA 94044
 Phone: (650) 589-4527
 Fax: (650) 559-4927

Bill To:

Bruce Stanley
 W. C. Service Company, Inc.
 4580 F. Los Angeles Ave., Ste E
 Simi Valley, CA 93063-3471

Invoice

Invoice Number: 594
 Invoice Date: 8/1/2006
 Terms: Due on receipt

Job Location:

Embassy Suites -Napa

Quantity	Item	Description	Rate	Amount
1	Labr	The Paul Rieger Company, at the request of W. C. Service Company, Inc. upon receipt of ironed and ironed on the heat exchanger for one (1) Range domestic for water boiler. Upon inspection The Paul Rieger Company found the following conditions: 1. The iron deposits 2. No mineral build up 3. No scale or any other type of deposits on the coils of heat exchanger We recommend that this unit be inspected in approximately 3 to 6 months in check whether a heat exchanger.	25.00	25.00
1	Labr	Boiler work	450.00	450.00

This invoice is subject to a service charge of 1.5% per month, annual percentage of 1.8% which is added to the net balance due on all invoices over 30 days past due. Purchaser agrees to pay all amounts due to company's bank. Other services to be paid on the date of an invoice.

Sales Tax (7.75%)	32.00
Total	\$677.80
Payments/Credits	\$0.00
Balance Due	\$677.80

Print View

Boiler Inspection

After 1 month, the Chief Engineer requested inspection of the 1.6 MBTU boiler.

Inspection results:

- No iron deposits
- No Mineral build-up
- No Scale or other types of deposits on internals of heat exchanger

Recommend inspection in 3 to 6 months. Now more than 5 years of consistent performance

Hotel Case Study

Embassy Suites 146 rooms

Background	
Location	La Quinta, CA
Problem	Commercial Softener Ban
Before Opening	22 Exchange tanks required changing 2 X month. \$1200+
Decision	Ordered ScaleStop system for entire water supply. Substantial savings and Regulatory compliance




Hotel Case Study

Embassy Suites 146 rooms Continued


Is my tap water "hard"?

Hardness in tap water is caused by calcium and magnesium, which are common minerals found in Coachella Valley groundwater supplies. The amount of hardness varies in the valley's drinking water and some areas do have hard water. Most CVDW customers receive water with only a moderate hardness.




Do I need a water softener?

Regardless of your hardness level, you **DO NOT** need a water softener for your home. More importantly, there can be negative effects from water softeners. Softened water is more corrosive than tap water and can leach lead and copper from your plumbing into your drinking water. Of particular concern are self-regenerating softeners that discharge salt down the drain. CVDW prohibits the discharge of excess salt down the drain because the salt eventually makes its way back to the aquifer, which increases future costs of providing sewer and water services.



For more information about water quality or hardness, read CVDW's annual Water Quality Report at www.cvdw.org, or call (760) 293-0821 ext. 259 to request a copy of the report be mailed to you. Questions may be directed to CVDW's Water Quality Division at (760) 388-0861.



Coachella Valley Water District

Letter issued to all users bashing Softeners .

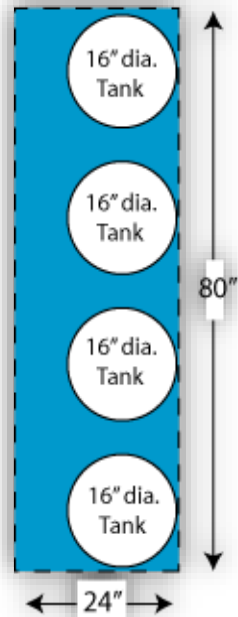
A commercial softener ban is in effect for this area however, this document was targeted at residential users.

Now many states are banning softeners nationwide.

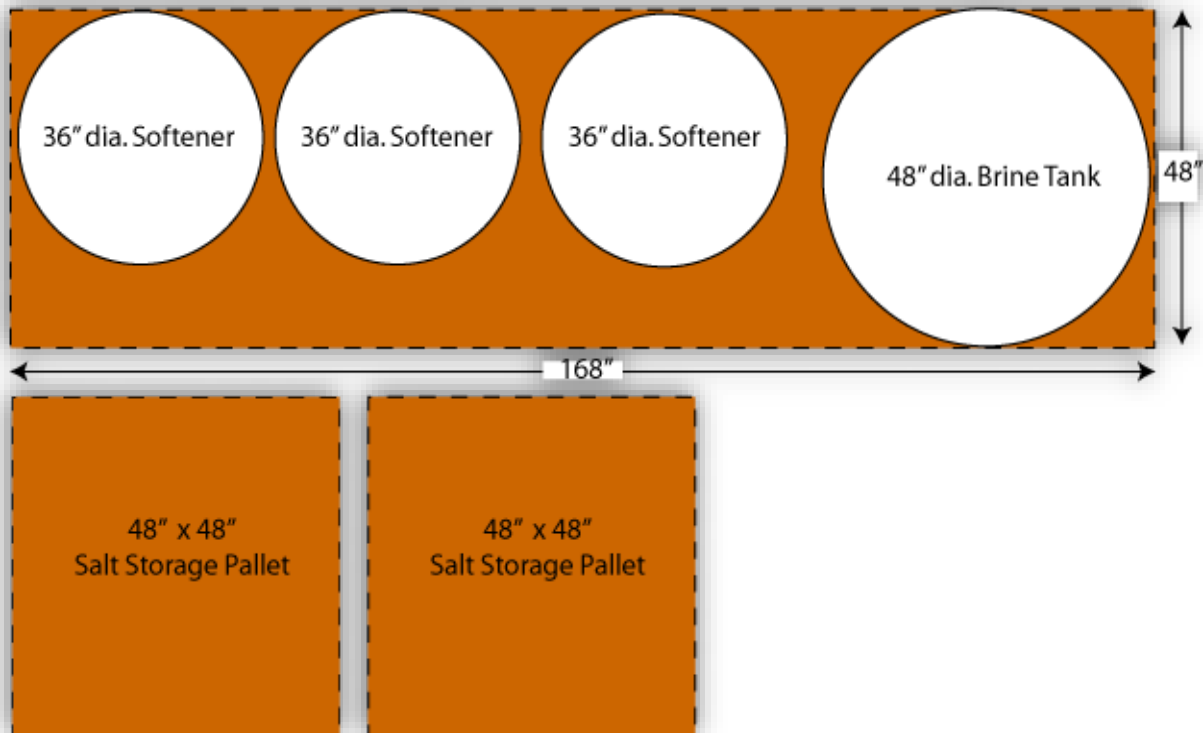
Comparison: ScaleStop vs. Conventional Softening

(Space Requirements)

TAC System
(4) 16x65" Tanks




Conventional Softener
(3) 36x72" Tanks, (1) 48" Brine Tank



Comparison: ScaleStop vs. Conventional

(300 GPM systems)

	Total Area	Salt Usage (lbs)*	Salt Cost*	Wastewater Volume
	13.33 ft ²	None	Zero	None
Softener	88.00 ft ²	64,285	\$7,713	10%

Usage and costs are annual. Assumes 15 grain water 257ppm 3,800 M³, 1 million gallons per month, 2800 grains/lb of salt, salt cost 0.12/lb delivered.

Installation Advantages

Did they forget to tell you the size of the Softener?



Scale Stop Installation Photos



Third Party Technology Verification: DVGW W512

Water Technology Center
Karlsruhe Water Laboratory
Karlsruhe, Germany



DVGW is the German Technical and Scientific Association for Gas and Water.

W-512 is the standard for testing Physical Water Treatment devices for scale prevention.

On this rigorous test, The original Next-ScaleStop achieved an efficiency rating of 99.6% for scale prevention

3. Analytic Results

Table 2.1 First Test Series (Plant 1 and 3 are untreated)

Ca ²⁺ + Mg ²⁺ (mol)	Plant 1	Plant 2	Plant 3	Plant 4
Heating coil	0.414	0.001	0.455	0.001
Container Walls	0.622	0.000	0.691	0.000
Residual >500 µm	0.180	0.011	0.121	0.000
Total	1216	0.012	1267	0.001

Table 2.2 Second Test Series (Plant 2 and 4 are untreated)

Ca ²⁺ + Mg ²⁺ (mol)	Plant 1	Plant 2	Plant 3	Plant 4
Heating coil	0.001	0.448	0.001	0.470
Container Walls	0.001	0.513	0.001	0.579
Residual >500 µm	0.002	0.189	0.000	0.172
Total	0.004	1.150	0.002	1.221

$$\text{Effectiveness Factor} = \frac{M [\text{Ca}^{2+} + \text{Mg}^{2+}]_{\text{untreated}} - M [\text{Ca}^{2+} + \text{Mg}^{2+}]_{\text{treated}}}{M [\text{Ca}^{2+} + \text{Mg}^{2+}]_{\text{untreated}}} \quad \mathbf{0.996 (99.6\%)}$$

Evaluation of Alternatives to Domestic Ion Exchange Water Softeners

By Dr. Peter Fox and Mara Ramos ASU

Tim Thomure and Wontae Lee HDR

April 2011



Results: Tempe Tap - Untreated



Tempe Tap: Electromagnetic








Tempe Tap: Electrically Induced Precipitation



Tempe Tap: Template Assisted Crystallization

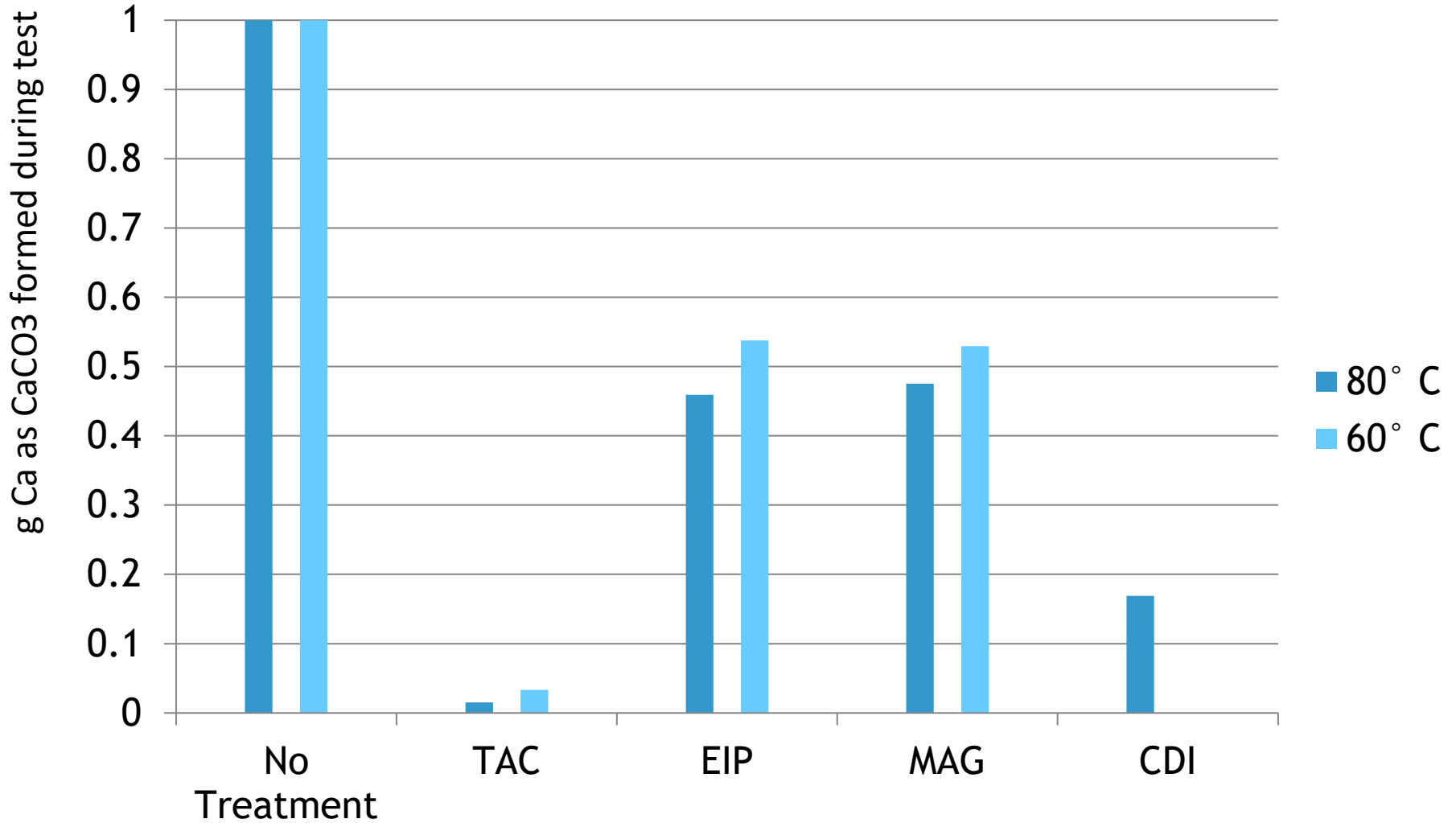


Results

Water Type	Treatment device used	Scale scraped off of heating element (g)	% Ca in scale formed	Ca formed in solid scale precipitate (g Ca)	Scale from bath and heating element dissolved with HCl (g Ca as CaCO ₃)	Total calcium formed during test (g Ca as CaCO ₃)	Photo of heating element with scale
Tempe tap water	No Treatment	-	NA	0.00	8.36	8.36	
	TAC	0.00	NA	0.00	0.12	0.12	
	EIP	0.68	34.88	0.24	3.60	3.84	
	MAG	1.44	34.88	0.50	3.47	3.97	
	CDI	0.00	NA	0.00	1.41	1.41	

Results

Scale Collected for Tempe Tap Water Tests



Results with Tempe Tap Water

- Next ScaleStop Template Assisted Crystallization worked best, 97%+
- Capacitive Deionization worked well enough to pass DVGW test
 - Both Electromagnetic treatment and electrically induced precipitation reduced scale formation but not enough to pass any reasonable test.

Water Market: Regulatory Pressures

Assembly Bill No. 334

CHAPTER 172

An act to amend Section 116786 of the Health and Safety Code, relating to water.

[Approved by Governor August 3, 2003. Filed with Secretary of State August 4, 2003.]

LEGISLATIVE COUNSEL'S DIGEST

AB 334, Goldberg. Water softening and conditioning appliances.

Existing law authorizes a residential water softening or conditioning appliance to be installed only if certain conditions are met.

Existing law provides, notwithstanding the above authorization, that a local agency may, by ordinance, limit the availability, or prohibit the installation, of residential water softening or conditioning appliances that discharge to the community sewer system if the local agency makes certain findings and includes them in the ordinance.

This bill would revise the findings that the local agency is required to make and include in the ordinance under this provision.

The people of the State of California do enact as follows:

SECTION 1. Section 116786 of the Health and Safety Code is amended to read:

116786. (a) Notwithstanding subdivision (b) of Section 116785, a local agency may, by ordinance, limit the availability, or prohibit the installation, of residential water softening or conditioning appliances that discharge to the community sewer system if the local agency makes all of the following findings and includes them in the ordinance:

(1) Limiting the availability, or prohibiting the installation, of the appliances is a necessary means of achieving compliance with waste discharge requirements issued by a California regional water quality control board. In determining a necessary means of achieving compliance, the local agency shall assess both of the following:

(A) The technological and economic feasibility of alternatives to the ordinance.

(B) The potential saline discharge reduction of the ordinance.

(2) The local agency has adopted and is enforcing regulatory requirements that limit the volumes and concentrations of saline discharges from nonresidential sources in the community waste disposal system to the extent technologically and economically feasible.

California, Legislation Banning Softeners SB1006, AB334

“Local agencies may regulate water softeners by ordinance to limit or prohibit the use of a water softener if an independent study that shows such regulation is a “necessary means” of achieving compliance with the water reclamation requirements or the master reclamation permit issued by a California regional water quality control board.”

Water Market: Regulatory Pressures



Nutrients in Drinking Water

Water, Sanitation and Health
Protection and the Human Environment
World Health Organization
Geneva

World Health Organization,
Report on Nutrients in Drinking Water,

“We conclude that hard water is good because it contains nutrients valuable in themselves and because these nutrients can decrease impact of toxic elements in the environment. To minimize heart disease risk, the ideal water should contain sufficient calcium and magnesium to be moderately hard. No effort should be made to eliminate trace elements such as copper and iron where these elements are in short, dietary supply.”

Water Market: Regulatory Pressures



Nutrients in Drinking Water

Water, Sanitation and Health
Protection and the Human Environment
World Health Organization
Geneva

World Health Organization,
Report on Nutrients in Drinking Water,

“Lower cardiovascular death rates were found in populations where the water supply contained relatively high levels of water hardness or calcium and magnesium compared to populations in areas with low levels. This protective effect was found for populations throughout the world, especially when country-wide studies were conducted.”

The “Green” Solution



- **Economical**
- **No salt or chemicals**
- **No Energy usage**
- **No Discharge**
- **Virtually No Maintenance**
- **Compact**

Contact Us

Tel: +1 (800) 783-0310 | Email: contact@nextwatertreatment.com

Website: www.nextwatertreatment.com

