SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER **CONDITIONER** SCALE CONTROL SYSTEMS

When performance & value matters.

EXCALIBUR Water Systems

SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER CONDITIONER SCALE CONTROL SYSTEM COMPONENTS

MINERAL TANKS

- Excalibur mineral tanks are made of high pressure composite materials - LLDPE liner with FRP filament winding outer shell
- Thread inlets are made from 30% glass filled PP provides higher strength, temperature and pressure limits versus glass filled PE
- This design provides excellent strength, durability and leak free service
- Maximum operating pressure 125psi
- Maximum operating temperature 120˚ F
- Mineral tanks are NSF 44 & PED certified

SCALE CONTROL MEDIA

- The Soft-Tec® salt free scale control media prevents the deposition of scale in pipes and heating/cooling systems
- Water flows continuously through the Media in up-flow condition allowing catalytic media perform the scale control process while performing service without any use of sodium chloride (water softening salt)
- Convert hardness particles to suspended crystals which are left with no electric charge and are unable to attach to plumbing and other systems
- LSI > -0.0
- pH: 7.0 to 11.5
- Limitations: Iron, manganese, copper, phosphates and other foulants must not be present

FLEXBED SCALE CONTROL OPTIMIZER

- FlexBed beads float on the water and surrounds the upper basket which helps in uniform collection of conditioned water at top
- Boost the performance of media in making crystals
- FlexBed protects the upper basket
- Increases turbulence in water which release carbon dioxide hence removes carbonic acid
- Loading 4GPM flow per 1 liter FlexBed

WATER DISTRIBUTION

- Excalibur ABS segmented stack distributors are utilized to evenly distribute water flow at bottom and evenly collect the water flow at top

RECIRCULATION SYSTEM

- Recirculation pump makes the system handle wide flow range, flow rate will be determined by tank size
- The recirculation pump's suction is connected to outlet and discharge at the inlet of conditioner with inbuilt check valve
- The plumbing of recirculation pump makes the conditioner to work efficiently even at low flow conditions.
- Energy efficient circulator reduces the power consumption by 50% or more
- Large display shows current energy consumption in watts
- Large display shows estimated flow in gallons per minute

SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER CONDITIONER APPLICATIONS

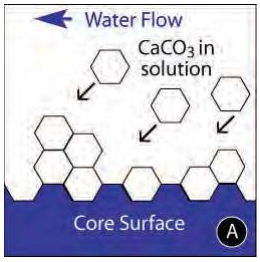
Commercial Applications

Condominium
Apartment buildings
Assisted Living Facilities
Hotels
Hospitals
Office Buildings
Schools
Gas Stations
Health Clubs

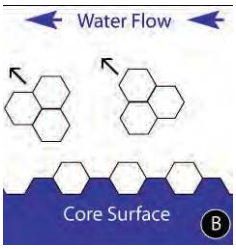
Industrial Applications

Paint Booths
Process Water
Aerospace
Food Processing
Bottling Plants
Cooling Tower
Electronics

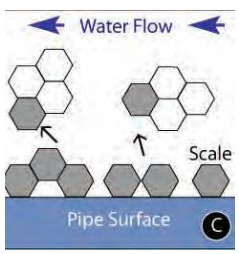
SOFT-TEC® COMMERCIAL/INDUSTRIAL WATER CONDITIONER SCALE CONTROL SYSTEM PROCESS



The Soft-Tec® water conditioner control harmful dissolved lime from water via ''template induced or epitaxial crystallization''. The water conditioner media surface accelerates the natural tendency of dissolved lime to crystallize, but does so before lime can deposit on pipes/surfaces further downstream. The composition of the Soft-Tec® Water Conditioner Media surface mimics that of calcium carbonate crystals, allowing the dissolved lime in hard water to form microscopic hard crystals of "activated lime" on the media surface via the process of "template induced or epitaxial nucleation."



The Soft-Tec® Water Conditioner Media returns lime to the water as stabilized crystals of "activated lime". Once the microscopic crystals of activated lime grow large enough, they are freed from the Soft-Tec® Water Conditioner Media surface by shear forces of water flow. This makes room for generation of new activated lime crystals. These activated lime crystals are "stabilized," and will not cause pipe scaling or stubborn lime deposits on surfaces. When the Soft-Tec® Water Conditioner Media-treated water dries on surfaces, these crystals form a fine, dusty residue that is easily wiped off without cleansers.



The Soft-Tec® Water Conditioner Media's produce "activated" crystals then remove pre-existing scale and prevent new scale formation. Calcium carbonate in pre-existing scale will slowly "redistribute" itself from the low-surface area of pipe surfaces and plumbing to the high surface area of all the crystals in solution. The trillions of microscopic crystals of activated lime provide an incredibly high total surface area for further epitaxial crystallization. The net result is removal of pre-existing lime scale from plumbing, keeping pipes and appliances lime-free whilst leaving a thin protective surface!

SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER CONDITIONER PROCESS

The Soft-Tec® scale control system's reliability transforms the positively charged calcium ions into calcium crystals. These calcium crystals are stable and cannot attach to any surfaces and hardware as the calcium crystals are rinsed away by the water flow. The size of the calcium crystals bonds is so small that they can only be seen with a microscope therefore the effect is the same as if the water was completely free of calcium. Tests lasting several years prove that these calcium crystals cannot attach to any kind of surface and the result was 100% scale control and prevention.

Also other ions can no longer attach to surfaces because of the structure of the surface created by the Soft-Tec® hardness stabilizer. The corrosion prevention works by adding a 30-micron protective layer to the surface of existing pipes and hardware. The Soft-Tec® specifications are calculated based on 75 grains per gallon or less.

The Soft-Tec® hardness stabilizer has a warranty of 5 years on all components and the complete system from defective components and workmanship. The maximum level of chlorine in your potable water supply must not exceed 3.0 ppm.

All iron, hydrogen sulfide, and tannins must be removed prior to water flowing through Soft-Tec® scale control water conditioner.

WATER CHEMISTRY REQUIREMENTS AFTER PRE-TREATMENT

Hardness: 0 - 75 GPG

Temperature: 36 – 122˚F (2 - 50˚C)

Pressure: 40-100 psi

Chlorine: < 3.0 ppm

Iron: 0.0 ppm

Sulphur: 0.0 ppm

Manganese: 0.0 ppm

Phosphate: 0.0 ppm

New Copper Pipe Installation

When new copper pipe is installed must wait 60 days prior to install. Because the new copper pipe has the potential of leaching copper into the water until it has a chance to build up a patina. The time required for this varies greatly from a few days to 60 days depending on water chemistry and how much damage was done to the plumbing system by the excessive use of corrosive flux in the soldering process.

Temperature

The seed crystals that are produced by the media will continue to grow or partially re-dissolve depending on changes of Langelier Saturation Index of the water. Temperature is one of five parameters that are factors in LSI.

SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER CONDITIONER PROCESS

Langelier Saturation Index

The Langelier Saturation Index (LSI) is a formula that was devised by Professor Wilfred F. Langelier (1886-1981) in order to quantify the propensity of a given source water to forming scale or corroding plumbing systems (and thereby leaching metals from plumbing components and fixtures into drinking water etcetera). The formula is based on the concept of ''Water Balance" or ''Saturation" where the carbonic acid (H_2CO_3) and the calcium carbonate ($CaCO_3$) present in the water are in a perfect state of equilibrium. The Soft-Tec® salt and chemical free scale control media requires the presence of ''available" or ''excess" calcium in order to produce and release the seed crystals into the treated water which then serve as nucleation sites for precipitating calcium further down the plumbing system.

In order to calculate the LSI, it is necessary to know the alkalinity (mg/l as $CaCO_3$), the calcium hardness (mg/l Ca_2+ as $CaCO_3$), the total dissolved solids (mg/l TDS), the actual pH and the temperature of the water (°C). LSI is defined as:

$LSI = pH - pH_s$

pH is the measured water **pH**

pH_s is the **pH** at saturation in calcite or calcium carbonate and is defined as:

$pH_s = (9.3 + A + B) – (C + D)$

Whereas

$A = (Log_{10} [TDS] – 1) / 10$

$B = -13.12 \times Log_{10} (°C + 273) + 34.55$

$C = Log_{10} [Ca_2+ \text{ as } CaCO_3] – 0.4$

$D = Log_{10} [\text{alkalinity as } CaCO_3]$

The formula above will return values > above and < below zero.
The interpretation of the results are as follows:

LSI	INDICATION
LSI < 0	Water is under saturated with respect to calcium carbonated
LSI = 0	Water is considered to be neutral. Neither Scale Forming nor Scale Removal
LSI > 0	Water is supersaturated with respect to calcium carbonate and Scale Forming may occur
- 2.0 < - 0.5	Serious Corrosion but Non Scale Forming
- .5 < - 0	Slightly corrosive but Non Scale Forming
LSI = 0.0	Balanced but pitting corrosion possible
0.0 < 0.5	Slightly Scale Forming and possibly corrosive
0.5 < 2.0	Scale Forming but non corrosive

As indicated above, the Soft-Tec® media requires available calcium to promote the formation of seed crystals. It can only do so reliably if it can induce the precipitation of calcium from a dissolved state into calcium carbonate crystal formations. Therefore, without proper pretreatment, the Soft-Tec® media should only be applied to treat water that has a neutral or positive LSI. Any method that would shift any of the parameters that are inputs into the LSI upwards (i.e. raising the pH, alkalinity or temperature etc.) would be acceptable methods. For the purposes of water treatment, however, the most common approaches are aeration and/or pretreatment with a neutralizer like calcite or dolomite to bring the water into a balanced state. Indeed, when used with corrosive water without pretreatment, the Soft-Tec® media itself will suffer the corrosive effects of the water and the functional surface will be dissolved over time rendering the media ineffective.

SOFT-TEC® COMMERCIAL / INDUSTRIAL WATER CONDITIONER TESTING

Soft-Tec® used the testing protocol of DVGW through an independent laboratory. DVGW is recognized throughout Europe like NSF in North America. The test was done by running raw 20gpg hardness water at 80˚C for continuous 21 days and then water with same properties treated by Soft-Tec® media was ran for 21 days. The comparison of Calcium scale proves the proficiency more than 99%.

21 Days Soft-Tec® Treated Water

21 Days Raw Water (20gpg)

After 90 Days Soft-Tec® Treated Water

After 90 Days Untreated Water

SOFT-TEC® COMMERCIAL/INDUSTRIAL SIMPLEX WATER CONDITIONER SCALE CONTROL SYSTEM SPECIFICATIONS

Soft-Tec® Benefits:

- No additional water, chemicals or salt required
- Scale control media will prevent scale build up in pipes, heating/ air conditioning systems and cooling towers
- No regeneration or stand-by time required
- Does not require control valve hence no electrical components except recirculation pump
- More tanks can be added parallel to overcome the demand increase in future requirements
- Less pressure drop compared to conventional softeners and filters
- Easy inline plumbing and no drain connection required
- Automated Recirculation pump with flow rate of 3 to 5 GPM to offset low flow conditions and maintain minimum flow when no flow is present

WATER CONDITIONER SPECIFICATIONS

MODEL	TANKS SIZE (in)	VESSEL MEDIA ft³ (Litres)		SERVICE FLOW (GPM)	INLET/OUTLET SIZE (in)	SPACE REQUIRED (in)			Shipping Weight (lbs)
	Dia x Height	MINIMUM	MAXIMUM			LENGTH	WIDTH	HEIGHT	
EWS NS1248	12 X 48	0.21 (6)	0.29 (8)	21	1	17	13	58	40
EWS NS1252	12 X 52	0.21 (6)	0.30 (8.5)	22	1	17	13	65	42
EWS NS1354	13 X 54	0.25 (7)	0.34 (9.5)	41	1.5	18	14	65	48
EWS NS1465	14 X 65	0.35 (10)	0.42 (12)	60	2	19	15	78	66
EWS NS1665	16 X 65	0.42 (12)	0.51 (14.5)	78	2	21	17	78	86
EWS NS1865	18 X 65	0.52 (15)	0.64 (18)	98	2	23	19	85	114

SOFT-TEC® COMMERCIAL/INDUSTRIAL DUPLEX IN PARALLEL WATER CONDITIONER SCALE CONTROL SYSTEM SPECIFICATIONS

Soft-Tec® Benefits:

- No additional water, chemicals or salt required
- Scale control media will prevent scale build up in pipes, heating/ air conditioning systems and cooling towers
- No regeneration or stand-by time required
- Does not require control valve hence no electrical components except recirculation pump
- More tanks can be added parallel to overcome the demand increase in future requirements
- Less pressure drop compared to conventional softeners and filters
- Easy inline plumbing and no drain connection required
- Automated Recirculation pump with flow rate of 3 to 5 GPM to offset low flow conditions and maintain minimum flow when no flow is present

WATER CONDITIONER SPECIFICATIONS

MODEL	TANKS SIZE (in)	VESSEL MEDIA ft³ (Litres)		SERVICE FLOW (GPM)	INLET/OUTLET SIZE (in)	SPACE REQUIRED (in)			Shipping Weight (lbs)
	Dia x Height	MINIMUM	MAXIMUM			LENGTH	WIDTH	HEIGHT	
EWS NSD1248	12 X 48	0.42 (12)	0.57 (16)	42	1	34	13	58	80
EWS NSD1252	12 X 52	0.42 (12)	0.60 (17)	44	1	34	13	65	84
EWS NSD1354	13 X 54	0.49 (14)	0.67 (19)	82	1.5	36	14	65	96
EWS NSD1465	14 X 65	0.71 (20)	0.85 (24)	120	2	38	15	78	132
EWS NSD1665	16 X 65	0.85 (24)	1.02 (29)	156	2	42	17	78	172
EWS NSD1865	18 X 65	1.06 (30)	1.27 (36)	196	2	46	19	85	228

SOFT-TEC® COMMERCIAL/INDUSTRIAL TRIPLEX IN PARALLEL WATER CONDITIONER SCALE CONTROL SYSTEM SPECIFICATIONS

Soft-Tec® Benefits:

- No additional water, chemicals or salt required
- Scale control media will prevent scale build up in pipes, heating/air conditioning systems and cooling towers
- No regeneration or stand-by time required
- Does not require control valve hence no electrical components except recirculation pump
- More tanks can be added parallel to overcome the demand increase in future requirements
- Less pressure drop compared to conventional softeners and filters
- Easy inline plumbing and no drain connection required
- Automated Recirculation pump with flow rate of 3 to 5 GPM to offset low flow conditions and maintain minimum flow when no flow is present
- Stainless steel flow control in middle vessel's inlet to control maximum flow

WATER CONDITIONER SPECIFICATIONS

MODEL	TANKS SIZE (in)	VESSEL MEDIA ft³ (Litres)		SERVICE FLOW (GPM)	INLET/OUTLET SIZE (in)	SPACE REQUIRED (in)			Shipping Weight (lbs)
	Dia x Height	MINIMUM	MAXIMUM			LENGTH	WIDTH	HEIGHT	
EWS NST1248	12 X 48	0.64 (18)	0.85 (24)	63	1	46	13	58	120
EWS NST1252	12 X 52	0.64 (18)	0.90 (25.5)	66	1	46	13	65	126
EWS NST1354	13 X 54	0.74 (21)	1.01 (28.5)	123	1.5	50	14	65	144
EWS NST1465	14 X 65	1.06 (30)	1.27 (36)	180	2	52	15	78	198
EWS NST1665	16 X 65	1.27 (36)	1.54 (43.5)	234	2	58	17	78	258
EWS NST1865	18 X 65	1.59 (45)	1.91 (54)	294	2	64	19	85	342

SOFT-TEC® COMMERCIAL/INDUSTRIAL QUADPLEX IN PARALLEL WATER CONDITIONER SCALE CONTROL SYSTEM SPECIFICATIONS

Soft-Tec® Benefits:

- No additional water, chemicals or salt required
- Scale control media will prevent scale build up in pipes, heating/air conditioning systems and cooling towers
- No regeneration or stand-by time required
- Does not require control valve hence no electrical components except recirculation pump
- More tanks can be added parallel to overcome the demand increase in future requirements
- Less pressure drop compared to conventional softeners and filters
- Easy inline plumbing and no drain connection required
- Automated Recirculation pump with flow rate of 3 to 5 GPM to offset low flow conditions and maintain minimum flow when no flow is present
- Stainless steel flow controls in middle two vessels inlet to control maximum flow per vessel

WATER CONDITIONER SPECIFICATIONS

MODEL	TANKS SIZE (in)	VESSEL MEDIA ft³ (Litres)		SERVICE FLOW (GPM)	INLET/OUTLET SIZE (in)	SPACE REQUIRED (in)			Shipping Weight (lbs)
	Dia x Height	MINIMUM	MAXIMUM			LENGTH	WIDTH	HEIGHT	
EWS NSQ1248	12 X 48	0.85 (24)	1.13 (32)	84	1	63	13	58	160
EWS NSQ1252	12 X 52	0.85 (24)	1.20 (34)	88	1	63	13	65	168
EWS NSQ1354	13 X 54	0.99 (28)	1.34 (38)	164	1.5	67	14	65	192
EWS NSQ1465	14 X 65	1.41 (40)	1.70 (48)	240	2	71	15	78	264
EWS NSQ1665	16 X 65	1.70 (48)	2.05 (58)	312	2	79	17	78	344
EWS NSQ1865	18 X 65	2.12 (60)	2.54 (72)	392	2	87	19	85	456

EXCALIBUR
Water Systems

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