



TREELIUM

T-Sonik 0M





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T-Sonik OM is a water harmonizer that works on the principle of Hydrodynamic activation. It is suitable for domestic, civil and industrial use, and is capable of eliminating lime scale build up while always keeping the chemical qualities of water unchanged with respect to its origin.

Thanks to the geometry and to the delivery pressure, the passage of the fluid inside the activator generates high frequency mechanical oscillations giving rise to ultrasound.

The particular frequency generated, has a direct effect on water providing the following advantages:

1

ELIMINATION OF
LIME SCALE
INCRUSTATIONS

2

REDUCTION
OF SURFACE TENSION

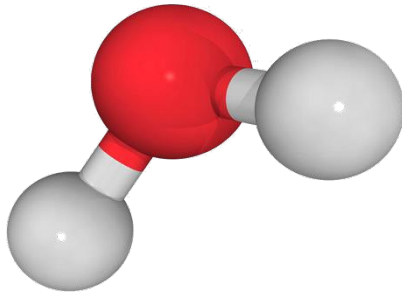
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BACTERIAL
DECONTAMINATION



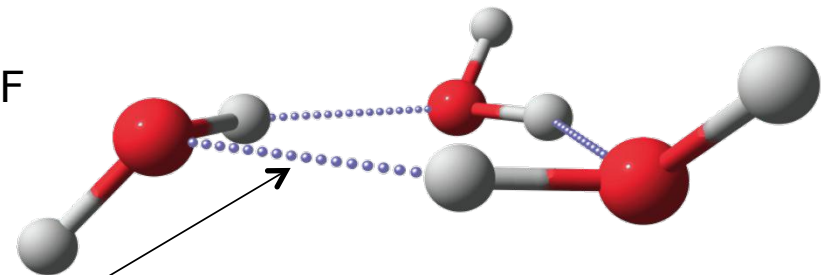
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WATER ACTIVATION MECHANISM



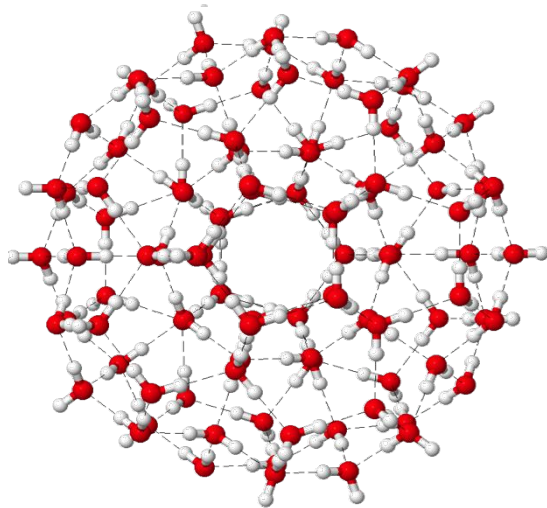
WATER MOLECULE

NATURAL FORMATION OF
CLUSTERS



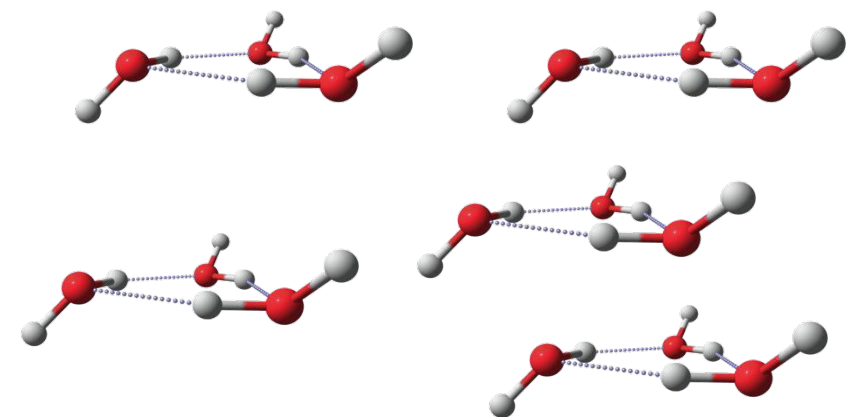
HYDROGEN BRIDGE

SOURCE CLUSTER



COMPLEX CLUSTER

ACTIVATION



SOURCE CLUSTER



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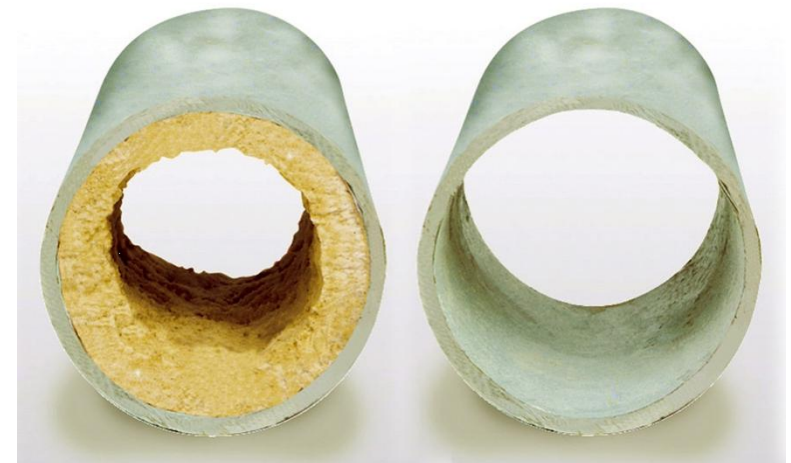
1 ELIMINATION OF LIME SCALE INCRUSTATIONS

The calcium and magnesium salts present in water in variable quantities tend to precipitate in the form of calcite crystals with the variation of temperature or pressure.

The crystals of calcite are very abrasive and will build calcareous structures that are very cohesive according the principle of maximum chemical packing (the least empty space possible).

This is how the disastrous phenomenon of lime scale deposits is generated, causing damaging consequences to devices and systems and higher operating and maintenance costs both in productive and domestic activities.

The limestone can however also precipitate into the crystalline form of aragonite forming polymorphic, acicular, slightly cohesive and poorly adhesive structures that remain in suspension and are easily transported by water flow.





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1 ELIMINATION OF LIMESCALE INCRUSTATIONS

Following the activation process, part of the limestone in solution will form vaterite nuclei of crystallization while the remaining calcium carbonate in solution will go to increase the crystallization nuclei instead of depositing on the walls.

After reaching a certain size the vaterite crystal will tend to degrade and to form minute aragonite crystals which will remain dispersed in the water.



Encrusting Calcite —————→ *Unstable Vaterite* —————→ *Non-encrusting Aragonite*

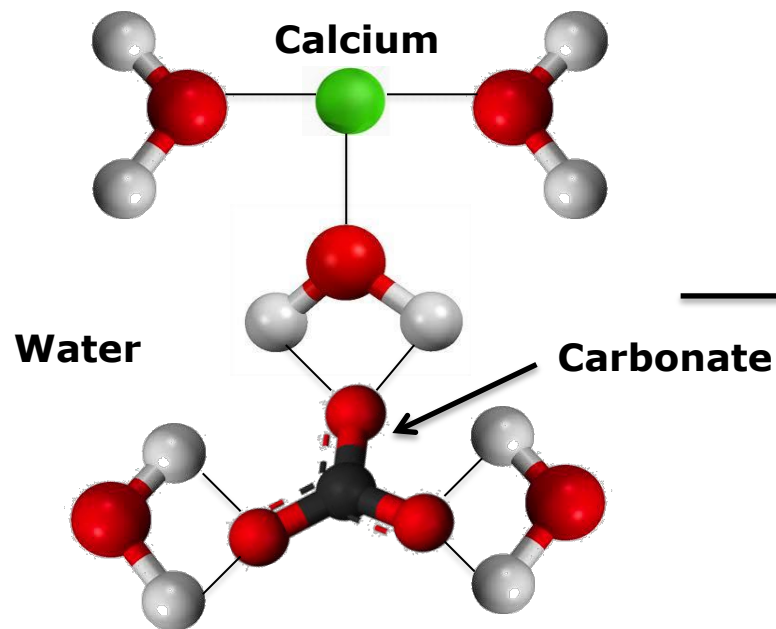
Unstable vaterite is a polymorphic form of calcium carbonate and it is therefore hardly found in nature.



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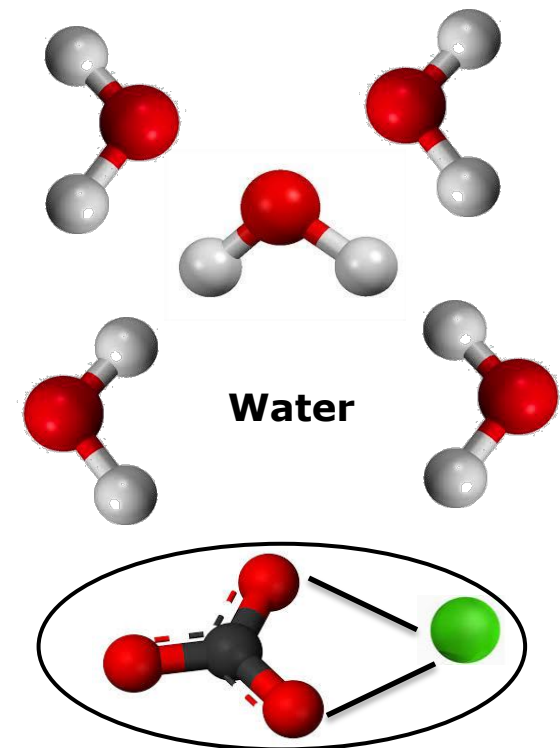
1
**ELIMINATION OF
LIME SCALE
INCRUSTATIONS**

REACTION MECHANISM



Limestone Solution

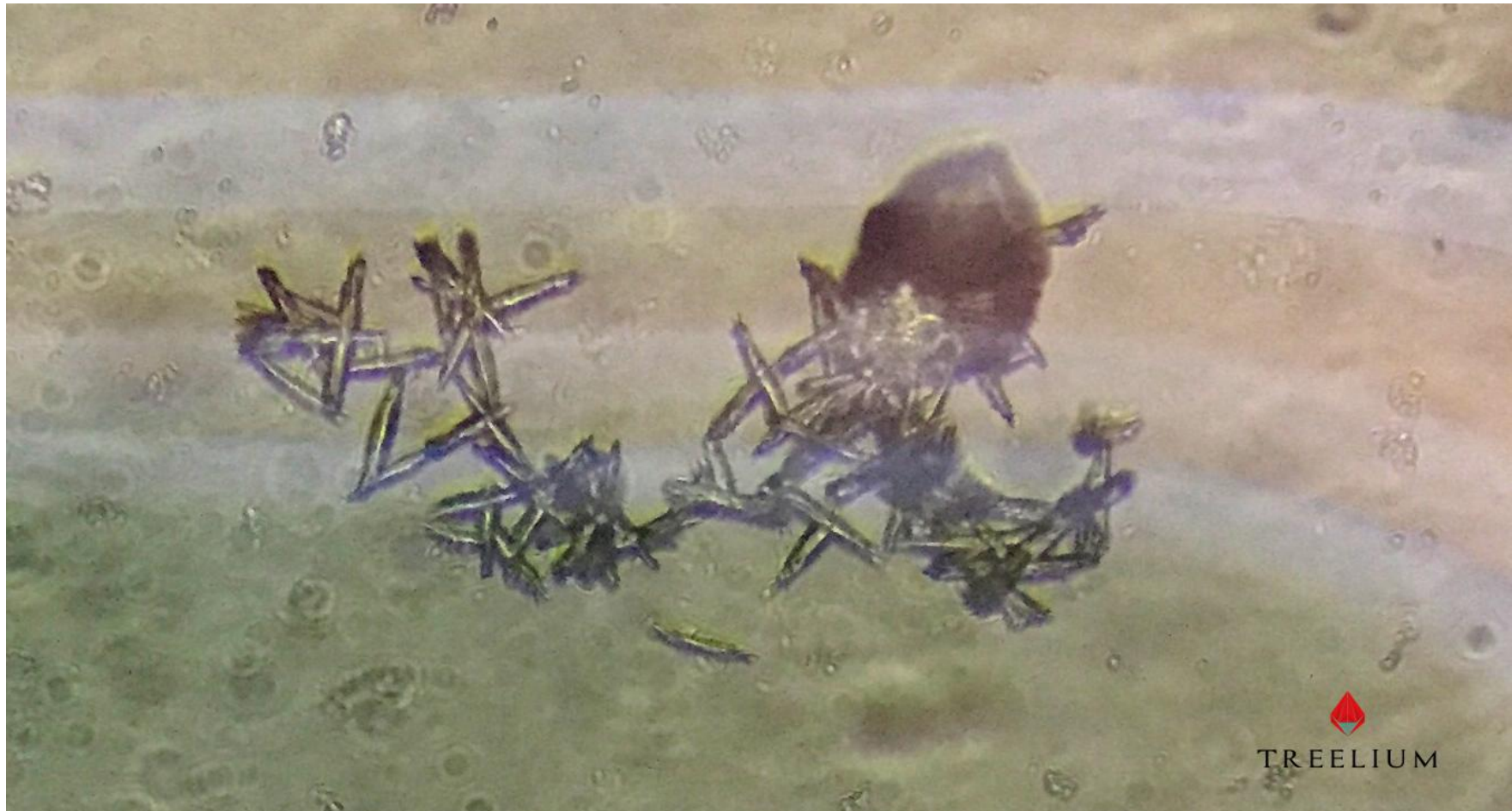
ACTIVATION



Vaterite Crystal



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Crystallization of the limestone (microscope photograph in the liquid phase): the hexagonal crystal of unstable vaterite begins to degrade, in the lower part, in acicular crystals of aragonite.

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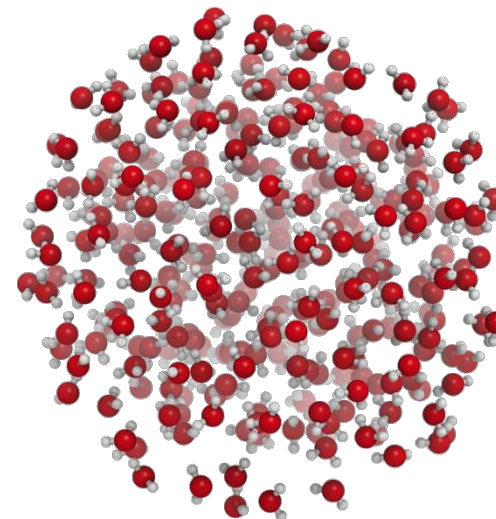
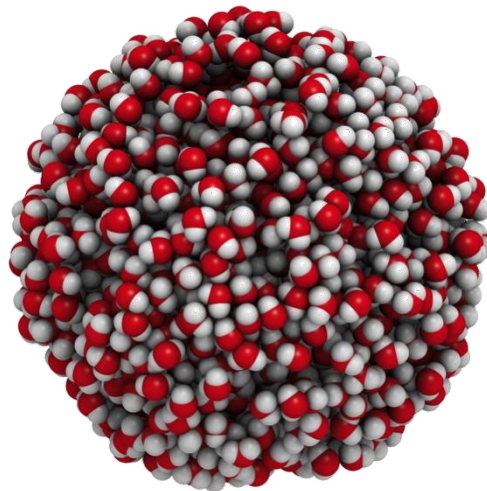
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2

REDUCTION OF SURFACE TENSION

As is widely demonstrated in Physics, water is composed of molecules that have the ability to combine and organize into ordered clusters (harmonious geometric shapes made from liquid crystalline structures). The regular geometric shape of the clusters (whose basic module is the tetrahedron) allows the emergence of electrodynamic quantum phenomena that are essential for the life of all living beings.

There are environmental factors that can inhibit or accentuate these phenomena (temperature, pressure, electromagnetic fields, etc.), but water in the ordinate molecular structure (in which the molecules oscillate coherently in phase) produces interesting phenomena such as variations of surface tension, of solvency power and of conservation and dissemination of energy information, without dispersion.





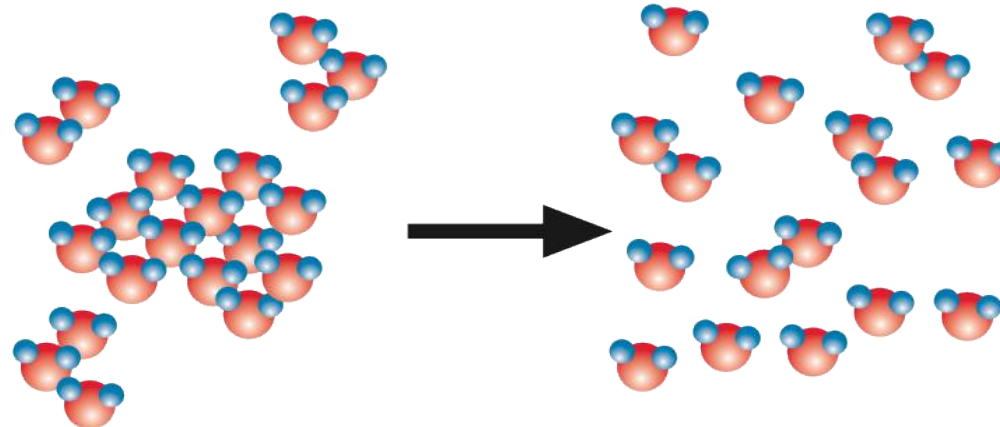
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2

REDUCTION OF SURFACE TENSION

As water passes in the T-Sonik OM, the mechanical vibrations and the ultrasounds determine the rupture of large groups of water molecules into smaller groups. This phenomenon allows us to have a greater exchange surface and therefore a greater solvency power; furthermore a greater number of small molecules produces a decrease of the viscosity of the fluid and at the same time a reduction of the surface tension.

By using T-Sonik OM the use of surfactants and detergents is reduced by a minimum of 50%.



**LARGE CLUSTERS OF
WATER MOLECULES**

**CLUSTERS OF ACTIVATED
WATER MOLECULES**



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3

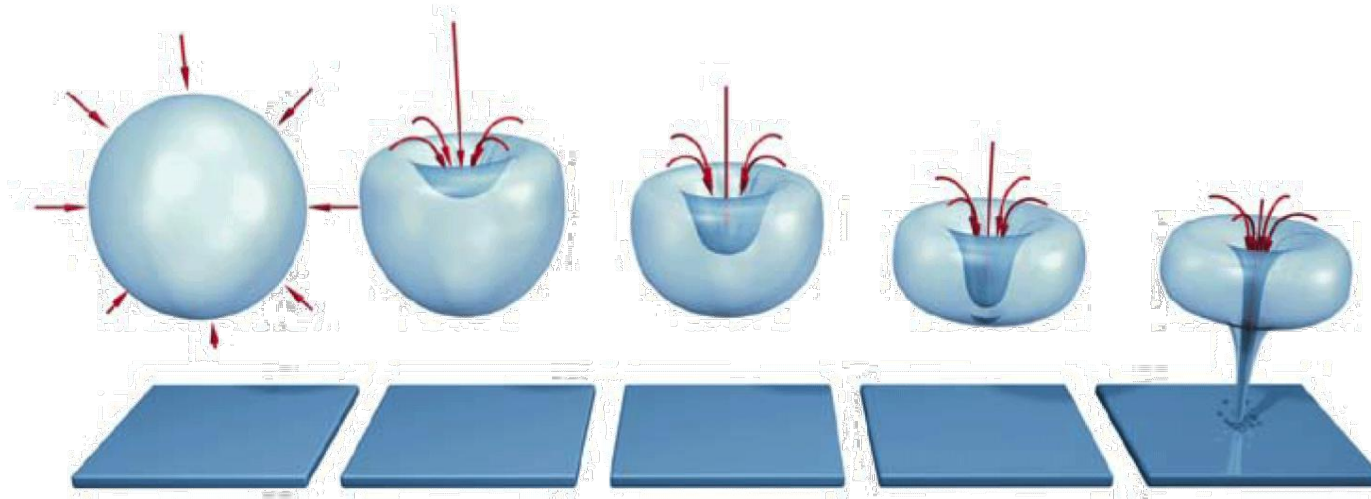
BACTERIAL DECONTAMINATION

When water passes through the activator, there is the propagation within the liquid of an elastic wave of adequate frequency and amplitude (an ultrasound) and there is an alternation of compression and expansion cycles.

If the ultrasound is sufficiently intense, the expansion cycle can generate cavities in the liquid.

Once the cavity has become too large it can no longer efficiently absorb energy, and without the input of energy it can no longer sustain itself. The liquid that surrounds it precipitates within the inside and the cavity implodes.

The implosion of the cavity creates an unusual substrate for chemical and biological reactions; the antibacterial effectiveness is notably related to the rupture of the bacterial cell walls specifically due to the ultrasonic cavitation effect.





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3

BACTERIAL DECONTAMINATION

As water flows inside the T-Sonik OM, 50 to 60% of the bacterial colonies are neutralized.
For a complete removal of bacteria it is necessary to work in recirculation.



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Cavitation bubble as seen under the electron microscope.

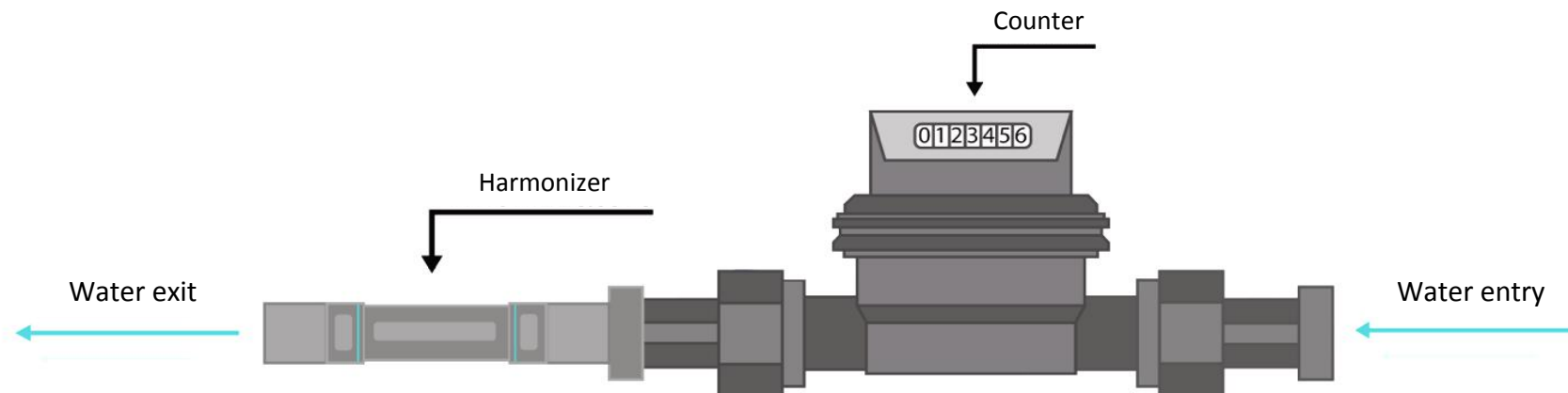
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INSTALLATION AND MAINTENANCE

T-SONIK OM should be inserted immediately after the water meter and we suggest placing a filter receptacle before the harmonizer.



It does not require any regular maintenance or replacement of parts.
T-Sonik OM does not change the original chemical composition of water.



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INSTALLATION AND MAINTENANCE

CORRECT INSTALLATION OF T-SONIK OM

- Install the device with the arrow pointing toward the water flow
- We recommend the use of a filter receptacle with normal mesh before the device
- Be sure to leave a section of linear piping of at least 6 cm from the T-Sonik OM outlet
- Do not connect grounding dispersers to the plumbing system
- The fixture, if necessary, should be placed on the piping and not directly on the T-Sonik OM

More information about the correct installation is given in the installation and maintenance manual



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T-SONIK OM DEVICES

Type	L (mm)	D (mm)	G (inches)	Weight (g)	Min flow Required (l / min)	Max Pressure (bar)
OM 1/2"	130	29	1/2	360	3.9	10
OM 3/4"	150	36	3/4	540	6.5	10
OM 1"	210	44	1	1,083	9	50
OM 1" 1/4	275	49	1 1/4	2,116	11.5	50
OM 1" 1/2	310	62	1 1/2	3,692	14	50
OM 2"	370	73	2	5,406	19	50

The minimum flow value required is the needed condition to ensure the activation of the water.

All the T-Sonik OM devices are made of stainless steel AISI 304.



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KEY BENEFITS T-SONIK OM

1 ELIMINATION OF LIME SCALE INCRUSTATIONS

- Less maintenance on the hydraulic system
- Less maintenance on heaters and boilers
- No reduction of efficiency on electric heaters
- No reduction in the opening of the pipes
- Improved water quality for domestic use

2 REDUCTION OF SURFACE TENSION

- Decrease of at least 50% of the use of detergents
- Possibility of reduction of the use of detergents for personal care
- Better surface wettability

3 BACTERIAL DECONTAMINATION

- Antibacterial properties (50-60%)
- Disinfection of water (in recirculation)
- We will shortly demonstrate how T- Sonik OM is able to eliminate also the Legionella issue

All these benefits enable considerable monetary savings but more importantly they improve the quality of our lives.



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T-Sonik OM is a product patented by TREELIUM SA and certified by internationally accredited laboratories.



TREELIUM continues to invest in Research & Development both in terms of human and economic resources to find new areas of application for existing products and to develop new ones for the future.

The Mission is to increase productivity by optimizing processes, reducing consumption and protecting the environment.

TREELIUM is on the market as an ideal partner for the supply of systems and applications in a global market where continuous technological innovation is the basis for Sustainable Economic Development.



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*"Water should always be preserved and respected as
the primary source of life ..."*

