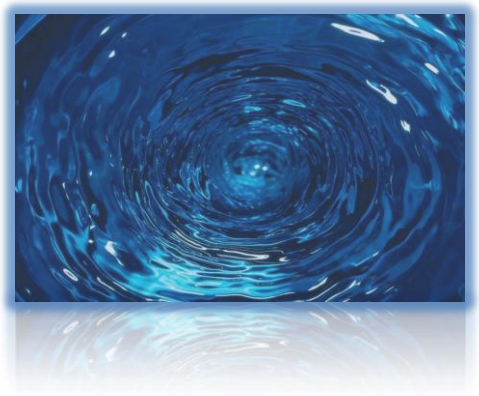
h2oVortex's single mission is the worldwide distribution of the IVG water treatment solutions based on the patented Vortex Process Technology (VPT) by

watreco

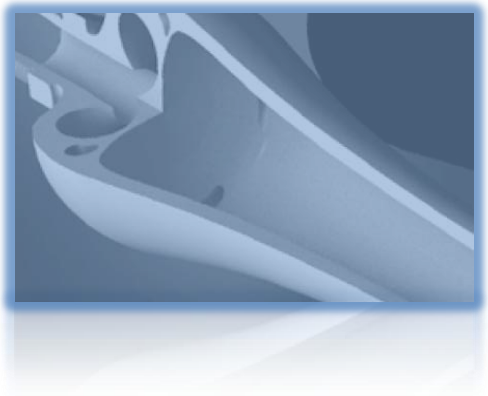
In Harmony with Nature

Idea behind the Technology?



Technology

Using Vortex Process Technology, VPT,
Generating strong vortex motion
Controlled environment



Operations

Mounted directly on water pipe
No moving parts
No need for energy source.

Effectiveness

Grinds down lime particles
Decrease Viscosity
Increase Conductivity
Increased Heat capacity

Agenda Topics

Who are we ?

What are we trying to solve ?

Our Environmental Position and Commitment

Vortex Technology Platform

Our Market Focus

Study Case and References

References

Other Markets, Future Application Areas , Yours?

Contact Details and Global Coverage

Who are we ?

- H2O Vortex is a Luxembourg based company which focus lies in commercializing and distributing sustainable and energy saving solutions to a wide variety of global markets
- Solutions are based on the Vortex Process Technology (VPT)
- Technology platform is owned and patented by Swedish cleantech company Watreco

What are we trying to solve?

VPT patented technology delivers water treatment solutions that will help you save water, save energy and reduce maintenance costs

- We help you reduce water consumption
- We help you reduce energy cost
- We reduce lime/calcium deposits
- We use no chemicals in our processes
- We offer easy installation and operation
- We work with the largest industry players
- We learn and extend our application fields everyday
- Against the highest levels of support and quality standards

Environmental Pyramid

Vortex Process Technology targets solution without chemicals while reducing energy at the same time

Alternative lime scale prevention technologies are based by adding chemicals and produce toxic waste

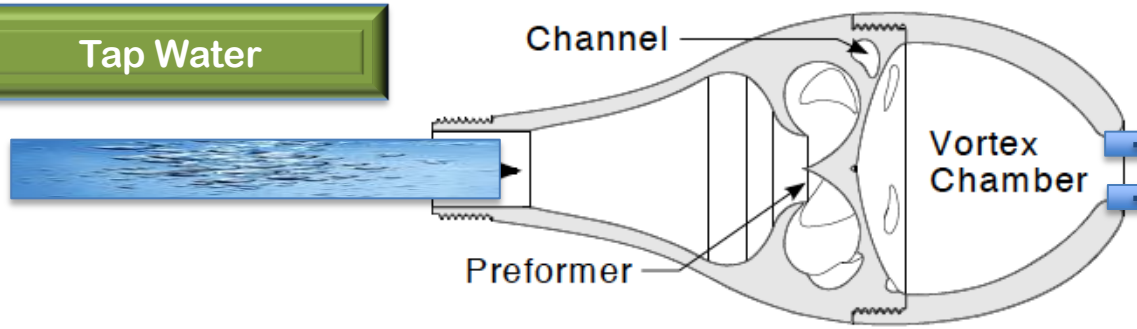
VPT Technology Platform:

2a

Degassing

Air Relief

Tap Water



1

3

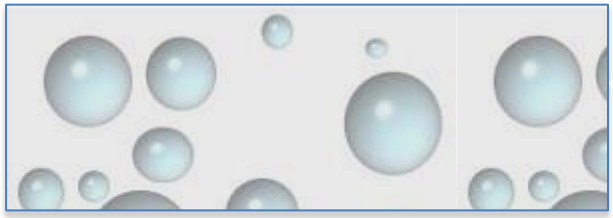
VPT Treated Water

- Viscosity 10% minus
- Heat transfer 3%+
- Electrical Conductivity 3%+
- Surface Tension = Equal
- Grinded Lime Particles
- Degassed Water

Formation / Fragmentation / Cavitation

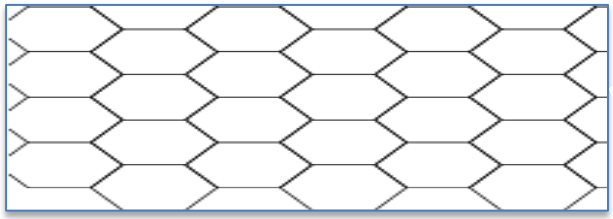
2b

What actually happens

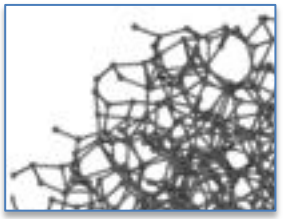


Build up of larger oxygen formation in Vortex chamber as oxygen unites in lower pressure area.

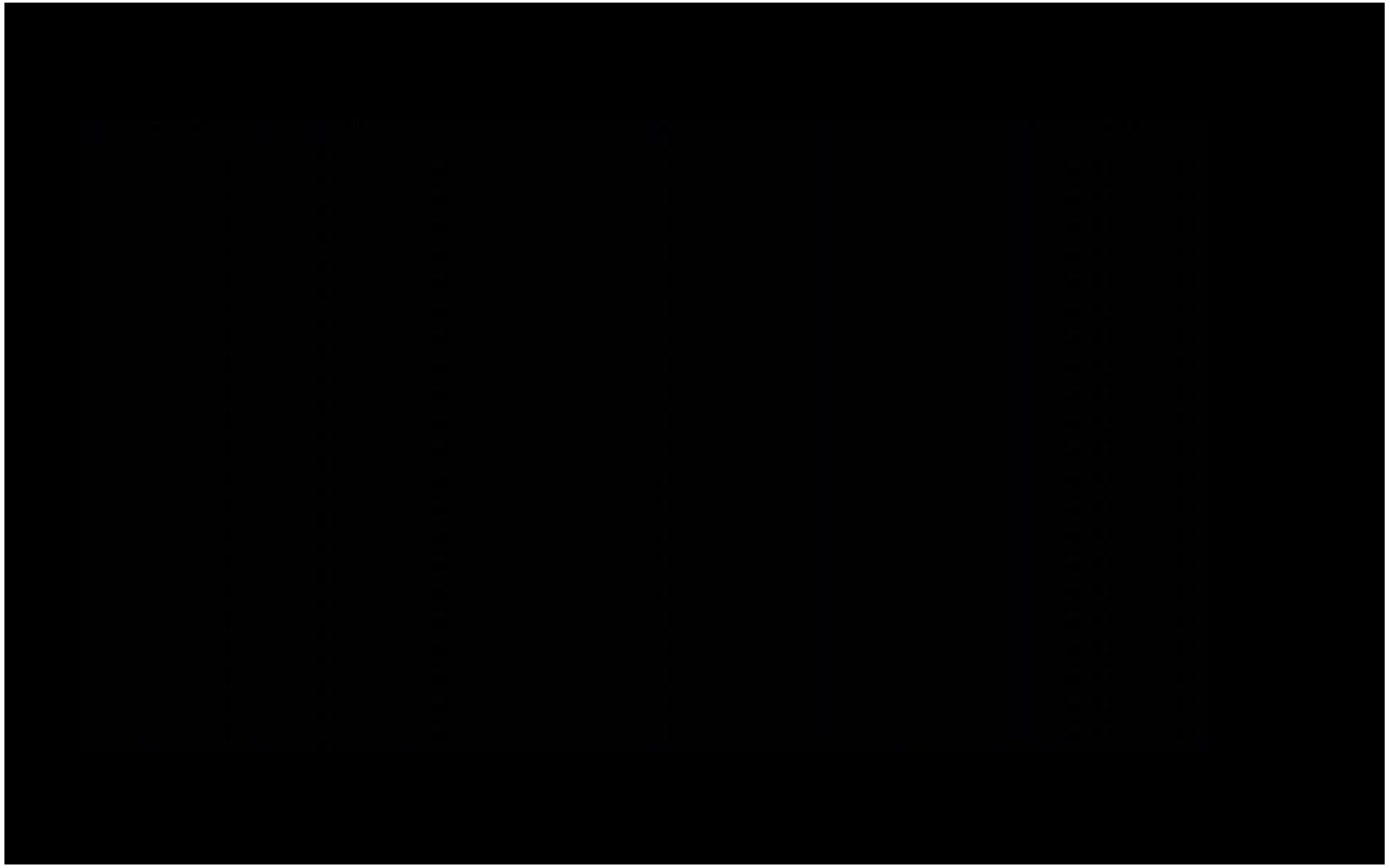
Isolated bubbles disperse into Micro bubbles when hitting Vortex Preformer stage



Hexagonal lime build up is scattered in amorphous structure and release its strength/structure



Videoclip - Vortex Process



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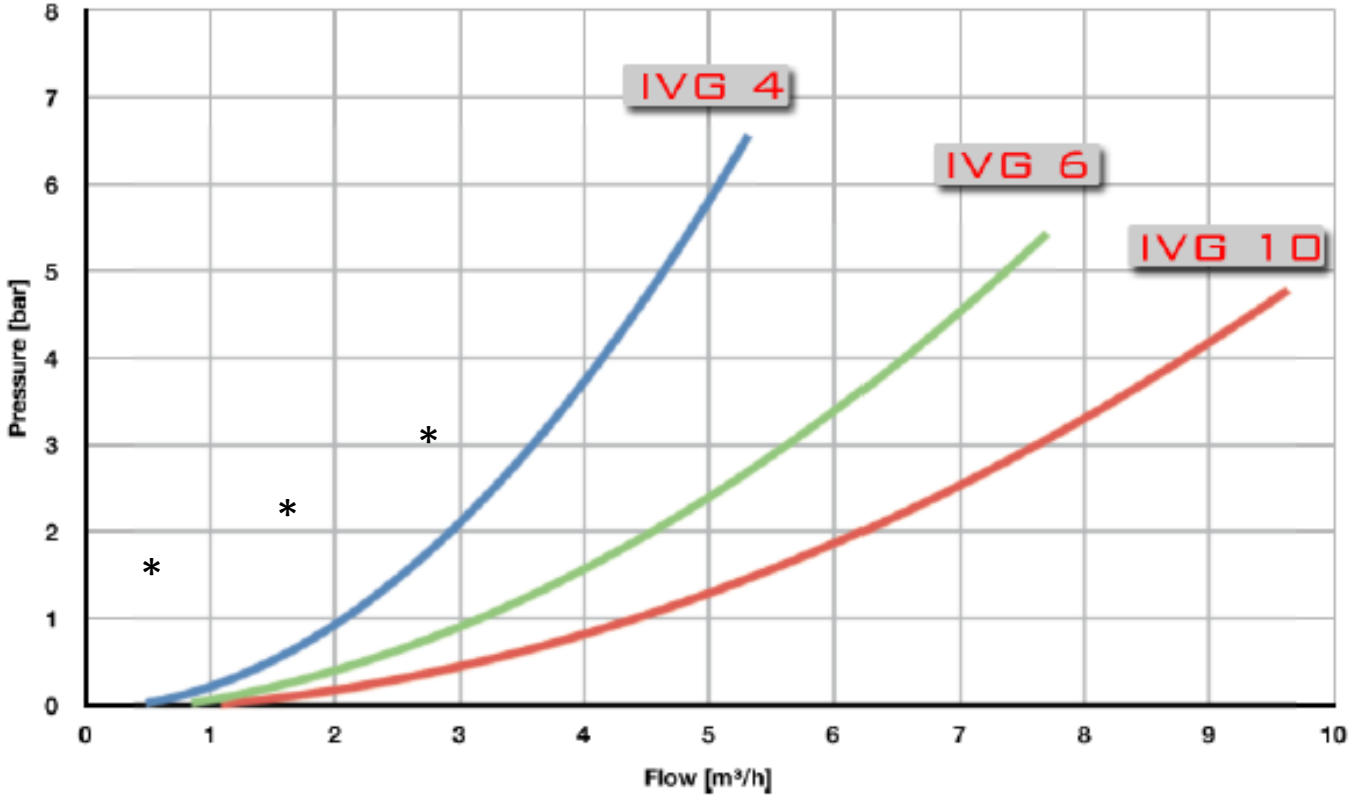
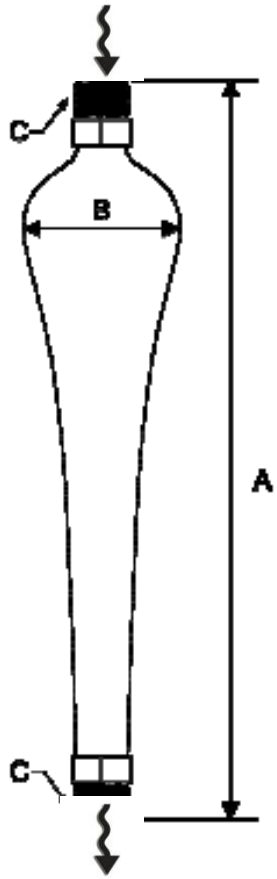
Product Breath IVG

Standard range for wide range of application



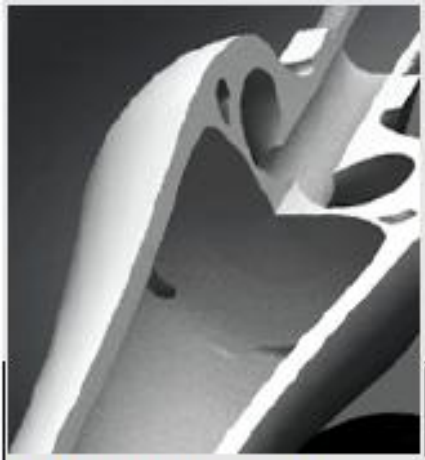
*IVG 1+2+3 available on request

Input: Pressure (Bar)



Output: Flow (m3/h)

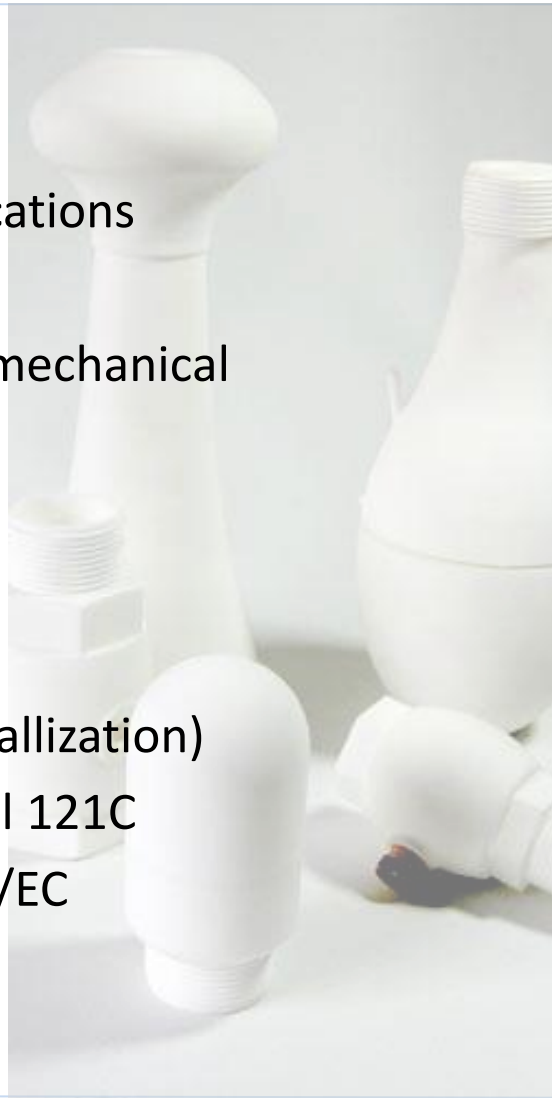
IVG Specifications and Operating Windows



		Watreco IVG 4	Watreco IVG 6	Watreco IVG 10
Max pressure @ 20℃		16 bar / 232 PSI (PN16)	16 bar / 232 PSI (PN16)	16 bar / 232 PSI (PN16)
Normal flow @ 3-5 bar		4 m³/h / 1057 gal/h	6 m³/h / 1585 gal/h	10 m³/h / 2642 gal/h
Max temperature		80℃ / 176 F	80℃ / 176 F	80℃ / 176 F
Length	(A)	376 mm	461 mm	544 mm
Diameter	(B)	82 mm	96 mm	120 mm
Weight		0,32 kg / 0.71 lb	0,46 kg / 1.08 lb	0,93 kg / 2.05 lb
Connect to:	(C)	ISO 228-G1"	ISO 228-G1"	ISO 228-G1¼"

IVG Material Properties

- IVG are made of PA2200 on the basis of Polyamide 12
- Very Balanced property profile for wide range of applications
- High Strength and Stiffness
- Typical Service Temperature -40C to +80C (maximum mechanical strength)
- Good Chemical Resistance*(report on request)
- Excellent Long Term constant behavior
- Contains stabilizers against oxidation
- Numerous finishing possibilities (powder coating , metallization)
- Bio Compatible following EN ISO 10993-1 and USP level 121C
- Approved for direct food contact EU directive 2002/72/EC
- Freeform ® Manufacturing Process



VPT Application Grid



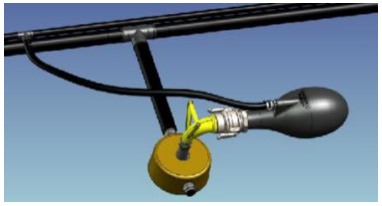

IVG Range	Cooling Towers	Lime Scale Residences	Irrigation Green Houses
IVG3	--	5-10 apartments	Mini
IVG4	Small	10-20 apartments	Small
IVG6	Standard	21-50 apartments	Standard
IVG10	Large	50-100 apartments	Large
IVG15	X-Large	> 100 apartments	X-Large

VPT Application Grid

REALice Range	Small Ice Rink	Standard Ice Rink	Multi Arena
REALice R4x*	X	X	
REALice R6x*	X	X	
REALice R10x*		X	X

***plus Realice r1x Hand Unit**

VPT Application Grid




FlowMix	Pond	Lake	River
FlowMix O-1	X		
FlowMix O-2	X	X	X
FlowMix O-3		X	X
FlowMix O-4		X	X

VPT Application Grid

FlowMix	Sewage	Aquaculture	
FlowMix O-1	Small	Small	
FlowMix O-2	Medium	Small/Medium	
FlowMix O-3	Large	Medum/Large	
FlowMix O-4	X-Large	Large	

Awards + Certifications

2009 Clean Tech Award Sweden

German DVGW W270 Certification Microbiological Test Compliance on PA2200

REALice Approved for Utility Incentives in USA and Canada

WWF Climate Solver 2011 Nominee

Bio-Compatibility test Following EC/ ISO 10993-1

IVG Cooling Tower Approved for Utility Incentives in USA

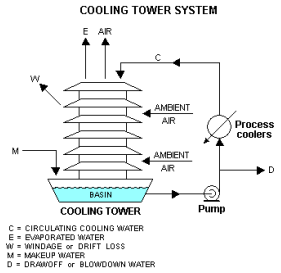
Market Focus :

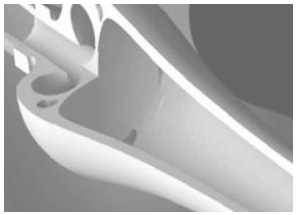
Industry: **Cooling Towers -** oil refineries, chemical plants, power stations, food processing and building cooling etc.

Application: IVG- CT Treated Water for Cooling Circuit

Feature: Lime/Calcium Prevention, Water savings

Benefits: No Chemicals - Less Wear and Tear - Less Energy – Higher Electrical Conductivity





Definition

What is a (wet, atmospheric) cooling tower?

A cooling tower is a heat rejection device, which extracts waste heat to the atmosphere though the cooling of a water stream to a lower temperature. Common applications for cooling towers are providing cooled water for air-conditioning, manufacturing and electric power generation. The generic term "cooling tower" is used to describe both direct (open circuit) and indirect (closed circuit) heat rejection equipment. A direct, or open-circuit cooling tower is an enclosed structure with internal means to distribute the warm water fed to it over a labyrinth-like packing or "fill." The fill may consist of multiple, mainly vertical, wetted surfaces upon which a thin film of water spreads. An indirect, or closed circuit cooling tower involves no direct contact of the air and the fluid, usually water or a glycol mixture, being cooled. In a counter-flow cooling tower air travels upward through the fill or tube bundles, opposite to the downward motion of the water. In a cross-flow cooling tower air moves horizontally through the fill as the water moves downward. Cooling towers are also characterized by the means by which air is moved. Because evaporation consists of pure water, the concentration of dissolved minerals and other solids in circulating water will tend to increase unless some means of dissolved-solids control, such as blow-down, is provided. Some water is also lost by droplets being carried out with the exhaust air. (drift)

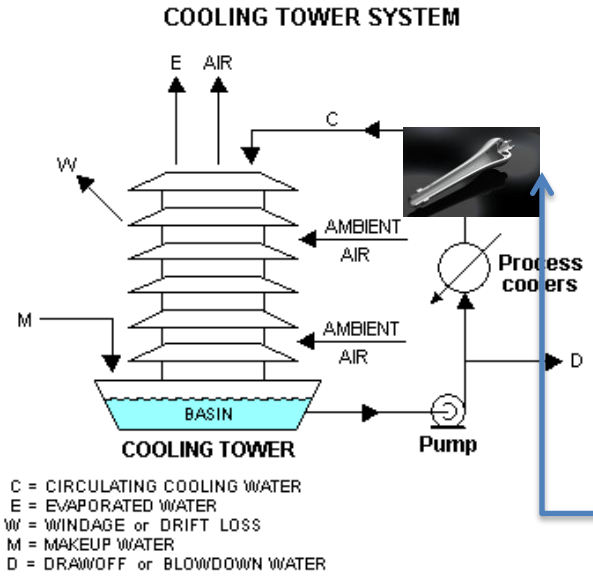
Source: Cooling Technology Institute

Encouraging the wise use of our water resources...

Common Cooling Tower Nomenclature

- **Acid**: any substance that donates a proton (H+) when dissolved in a solution. In water treatment, it usually means circulating water with a pH of less than 7.0. Sulfuric acid is the most common acid used to control cooling water pH.
- **Algaecide**: a toxic material that will kill algae. Some of the more commonly used algaecides are chlorine, copper sulfate and phenolic compounds.
- **Biocide** :a chemical that is designed to control the population of troublesome microbes by killing them.
- **Biostat**: a chemical that is designed to control the population of troublesome microbes by inhibiting their reproduction and subsequent increase in population.
- **Chlorination**: adding chlorine or a chlorine derivative to water to prevent the growth of various organisms that cause biofouling.
- **Chlorine**: a poisonous yellow gas with chemical symbol Cl2 used for water treatment. It is soluble in water but can be removed by reducing aeration and reaction with sunlight.
- **Denitrification**: the removal of nitrogen from a system. This may be done chemically or biologically.
- **Molluscicide**: a material that will kill molluscs.
- **Scale:** the deposition on heat transfer surfaces of material normally in solution, as opposed to fouling, which is deposition of material normally in suspension.

Cooling Tower Water Treatment



Lower Temperature of Water through evaporation

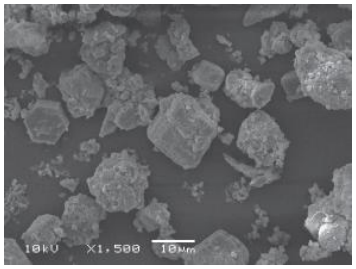
Problem Statement:
Water circulating is very corrosive and contains micro organism and lime.
Impurities picked up in cooling tower cause scale and lower thermal efficiency.
It also clogs piping where circulating pumps need to work harder and consume more power.

Typical Solution:
Aggressive Chemicals used to control scaling and corrosion, producing high amounts of chemical Discharge.

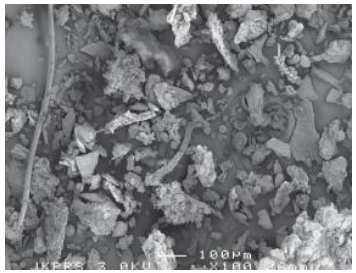
H2O Vortex Solution:
IVG-CT treated water grinds down lime impurities significantly reducing scaling without hazardous Discharge.

Case Study

Location :	Asten Breda Holland
Date of testing:	June 2011
Application:	**IVG-CT, Cooling Tower**
Study:	Supervised by Pathema
Problem Statement:	Thick lime scale covering blades



Before IVG-CT → Aragonite Structure (Hexagonal)*
Samples taken of Typical Tap Water
(Solid crystals as building blocks for lime scale creation)



After IVG-CT → Amorphic Structure (Chaotic Rounded)*
Samples taken from Cooling Reservoir after cooling application
(Powder structure hinders lime scale creation and provides easy removal)

* SEM tests by Wetsus

References @ Cooling Towers

- Heineken, NL
- Huntsmann, NL
- Friesland Campina, NL
- VCA, Asten, NL
- Vriesoord, Den Bosch, NL
- Vriesoord, Boxtel, NL
- Firma, Oostende, Belgium
- Vitelco, Den Bosch, NL
- Flevo Farm Service, PuYen
- Van Soest, Rijkevorsel, Belgium
- Van Soest, Kesteren, NL
- Community Icerink, Breda

Close relationship with the Customers

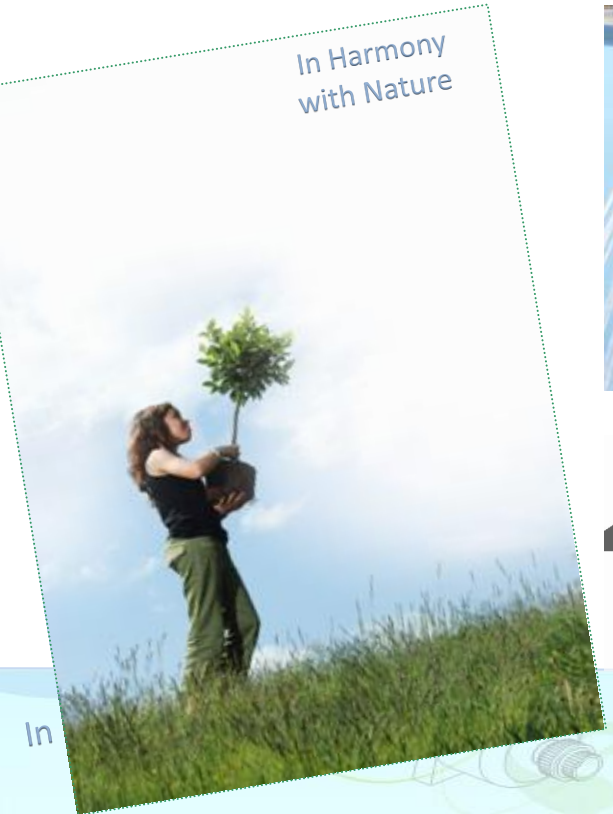
Market Focus :

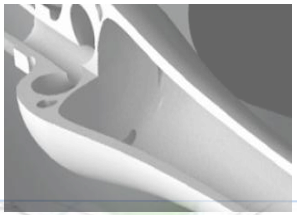
Industry: **Domestic -** Homes , Residences, Stores , Restaurants etc.

Application: Vortex Treated Water for Water supply/usage

Feature: Lime/Calcium Prevention

Benefits: No Chemicals - Less Wear and Tear - Less Energy





Case Study

Location : Val des Roses Residence , Luxembourg

Type of Installation: IVG 6 after fresh water filter (using ground water)

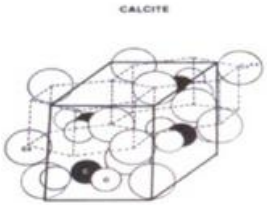
Anno: Jan 2011

Application: **Domestic Lime Treatment**

Problem Statement: Reduce maintenance of water based infrastructure

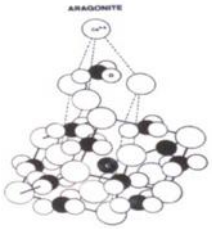
Extension lifetime of appliances

Before VPT



Aragonite Structure (Hexagonal)*
Heavy contamination with lime and rust

After VPT
6 months



Amorphic Structure (Chaotic Rounded)*
Eliminate piping contaminating
lime/rust deposit elimination

* Ambiente Da Cruz

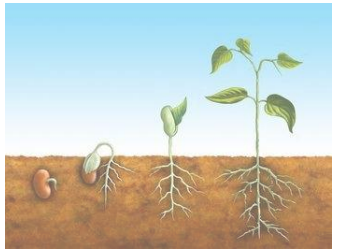
Market Focus :

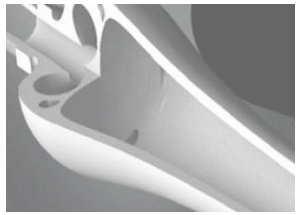
Industry: **Irrigation -** Agricultural Industry

Application: Vortex Treated Water **to enhance productivity of crops**

Feature: Elimination of Lime and Air bubbles

Benefits: Increase of absorption of the nutrients by plants = increase plant growth , plant viability , crop yield , weight , shelf life.





Case Study

Location : Advanced Horticulture Company*
(Al Hayer, by Al Ain, Abu Dhabi Emirate, UAE)

Type of Installation: IVG 6 treated Vortex Water Tank & Non treated Water Tank

Anno: May to July 2011

Application: **Enhance productivity of cucumber crop** and establish comparison between Vortex treated and Non- treated crop

Vortex Treated

Non - Treated

Test Results

- Faster growth , +2 cm higher
- Equal # seeds creating +10% viability
- Crop Yield + 6.35% higher
- Lower rejection rate nearly -20%
- +5% increase in roots weight
- +1 to 2 days shelf life equal +20%
- More juicier substance

*Test realized by Food Safety Management Consultancy
Dr. Abdulla Ruwaida – detailed report on request H2oVortex

In Harmony with Nature

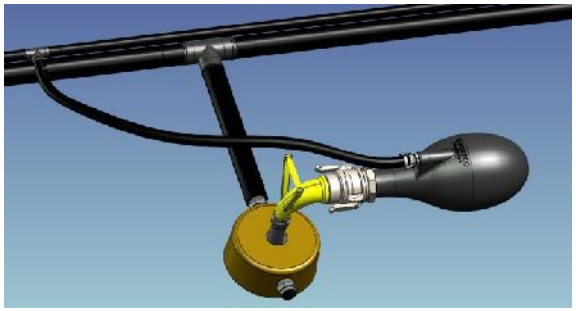
Market Focus :

Industry: **Aeration - Sewage, Lakes & Rivers, Aquaculture**

Application: FlowMix-O Treated Water to achieve high aeration in Sewage, Lakes & Rivers, Aquaculture

Feature: Mixing Air with Water

Benefits: High efficiency, Low energy usage, No noise, Installed bellow water surface, Low Maintenance



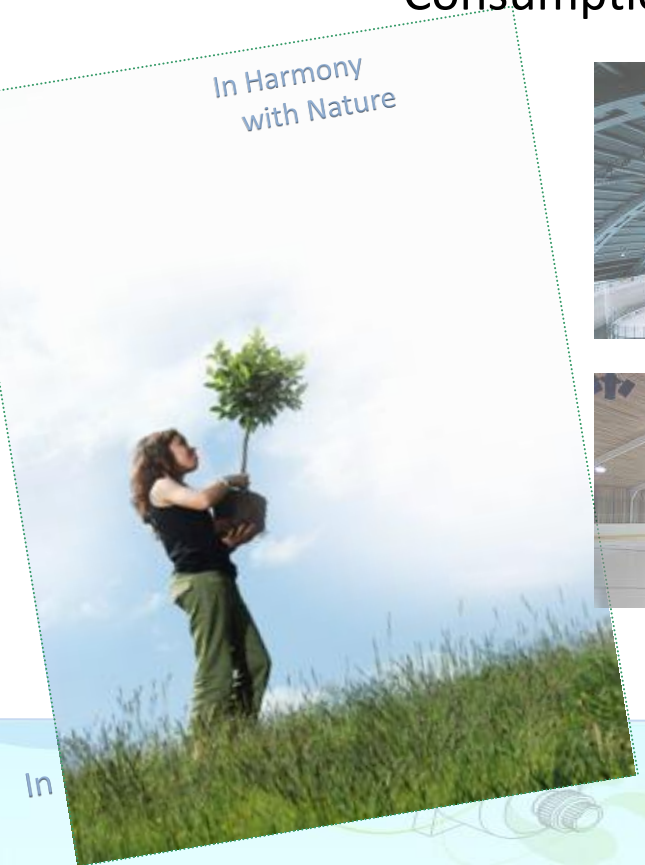
Other Markets :

Industry: **Ice Rinks**- REALice ™

Application: Complete Water System for Ice Rink Water Treatment

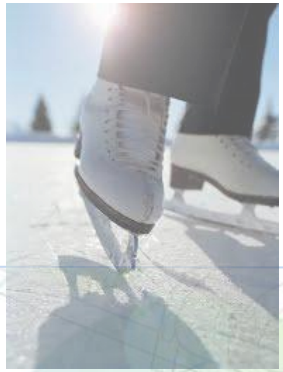
Feature: Degassing , micro bubble dispersion, Anti-Lime scaling

Benefits: Higher Ice Temperature–Less Hot Water Consumption– Less Energy Consumption – Less Lime Scale Formation – Improved Ice Quality



"Savings are significant and It contributes to a better hockey Game"

Dr. Alan Murdoch
Head Coach & General Manager
Cyclone Hockey
Iowa State University

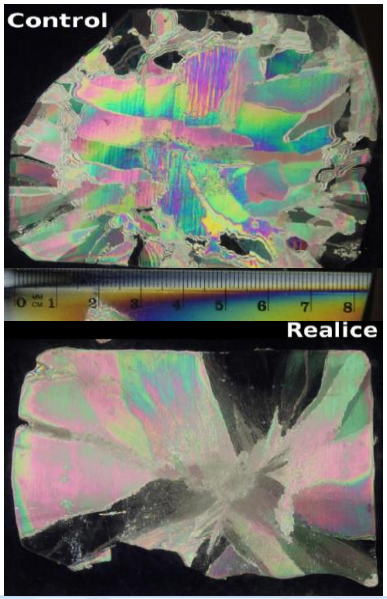


Ice Rinks and Crystal Formation

Location : Lulea Technical University Sweden

- Water: Luleå municipal tap water
- Pressure: 4 bar
- Flow: around 1 m3/h
- Unit: ST
- Treated and untreated water was filled into 500 ml containers and left to freeze at -10 °C.

Thin slices were cut from the ice blocks and placed in cross-polarized light. Examples of the resulting images are shown below figures



Before Realice →
Rich micro bubbles formation
Smaller crystal structure
Increases Viscosity
Less Heat Conductivity
Higher Energy Usage

After Realice →
Poor micro bubbles formation
Larger crystal structure
Decreases viscosity
Higher Heat Conductivity
Less Energy Usage

* Images by Lulea TU

References @ Ice Rinks

Multi Arena's + 12000 spectators

- Malmö Arena , Malmö/Sweden
- Hartwall Arena , Helsinki/Finland
- O2 Arena, Hamburg/Germany

Arena's + 4000 spectators

- Olympiahalle, Munich/Germany
- Olympiaworld, Innsbruck/Austria
- Patinoire des Vernets , Geneva/Switzerland

Ice Rinks

- Tivoli, Aachen/Germany
- Iowa State University, Ames/USA
- Mohawwk4, Hamilton/Canada
- Leukerbad/Switzerland

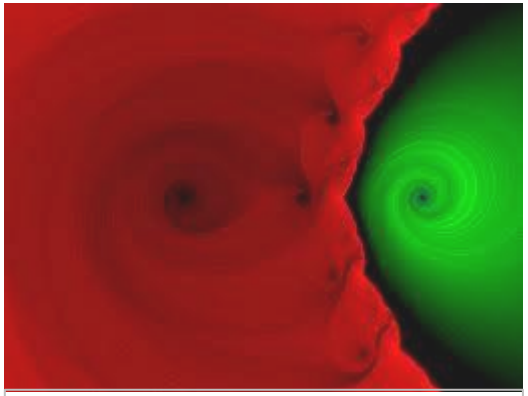
Further Possibilities

Irrigation = Pure Water

Cleaning = Less water , no stripes

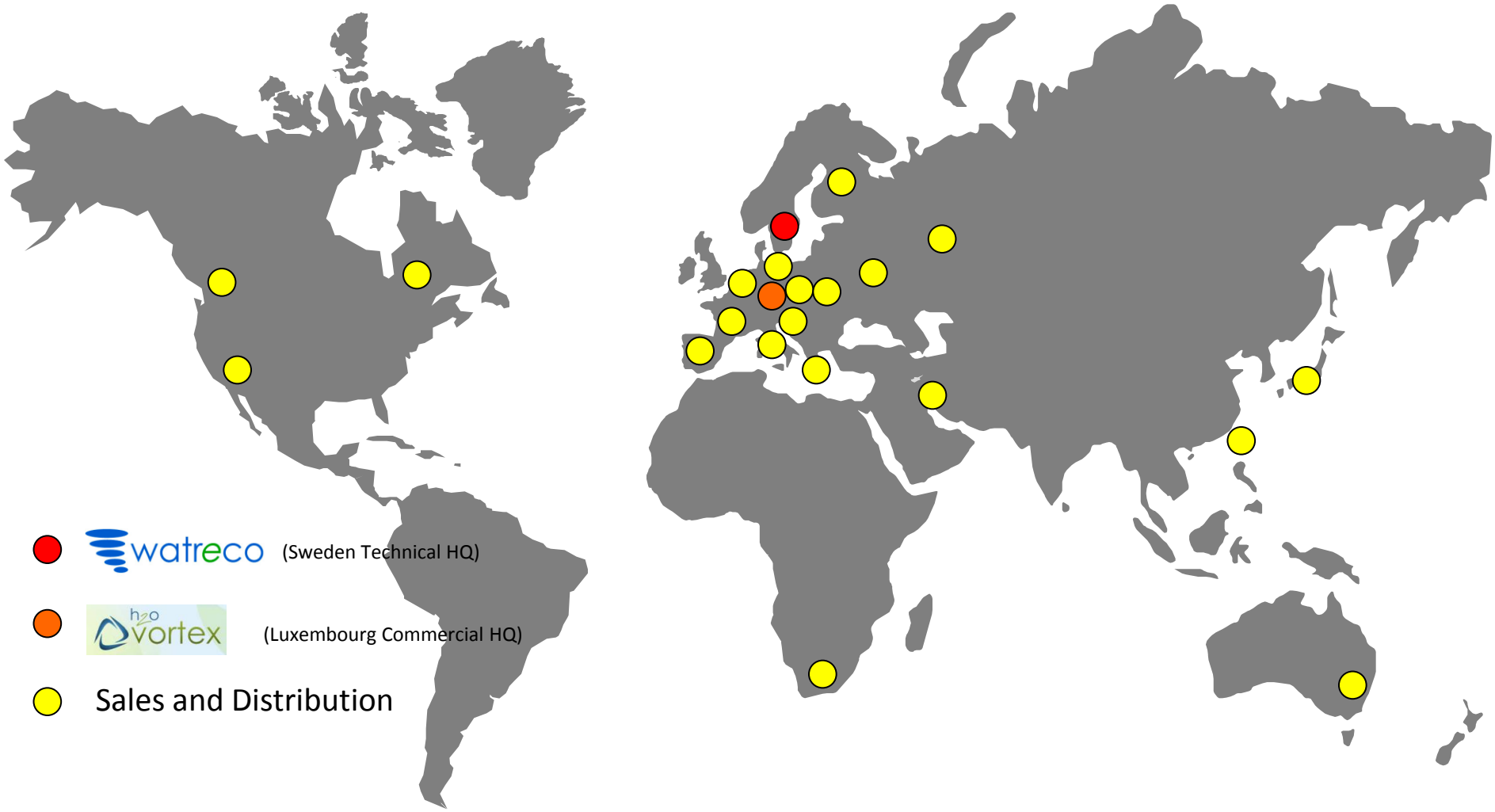
Agricultural = Crop Yield

Degassing Liquids = Painting and/or Coating Industry



Mixing = Fast and Efficient

Our World Wide Coverage



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h2o vortex

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Email: amh@moss.org.au

Skype: amhmoss

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