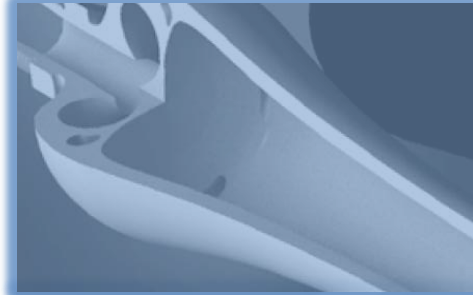
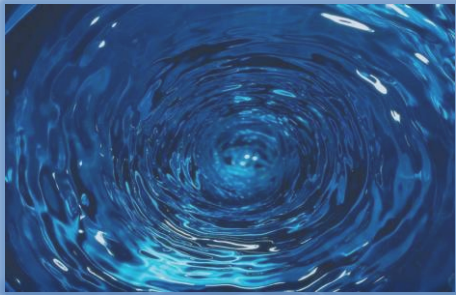


**h2oVortex's single mission is the worldwide distribution of the IVG water treatment solutions based on the patented Vortex Process Technology (VPT) by**



In Harmony  
with Nature



## 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



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



- 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

*In Harmony  
with Nature*



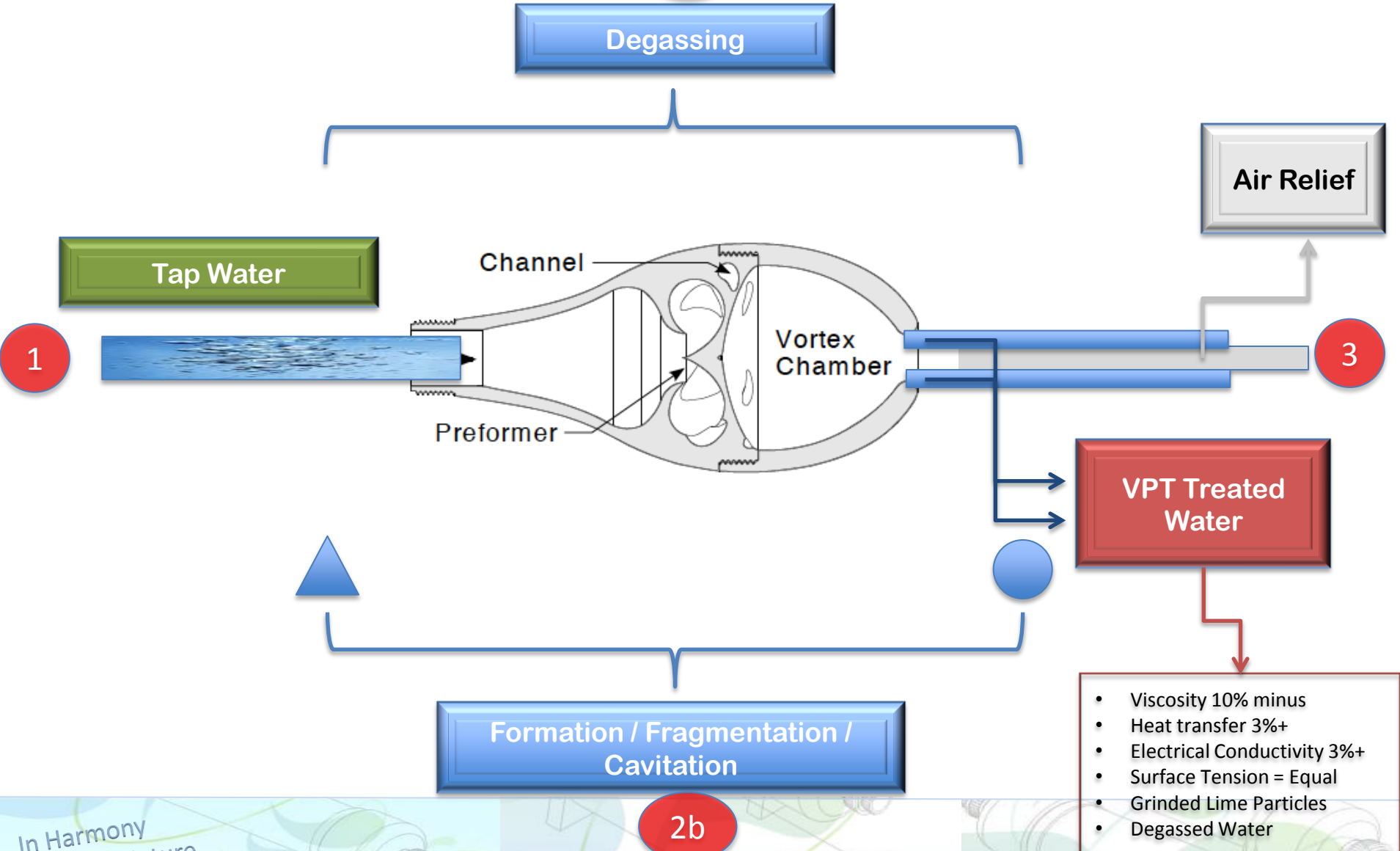


Vortex Process Technology targets solution without chemicals while reducing energy at the same time

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



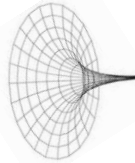
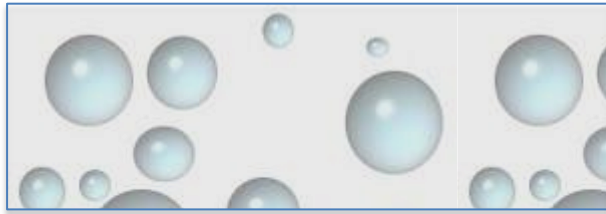
2a



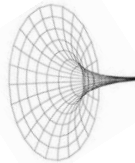
2b

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

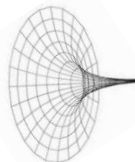
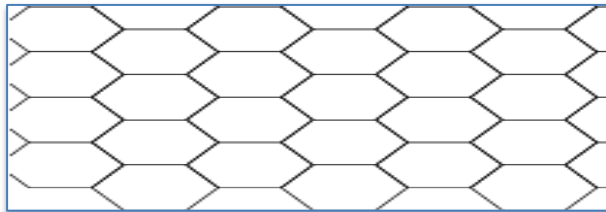
# What actually happens



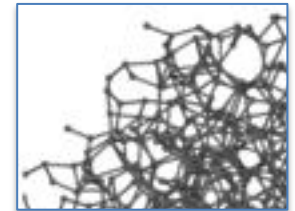
Build up of larger oxygen formation in Vortex chamber as oxygen unites in lower pressure area.

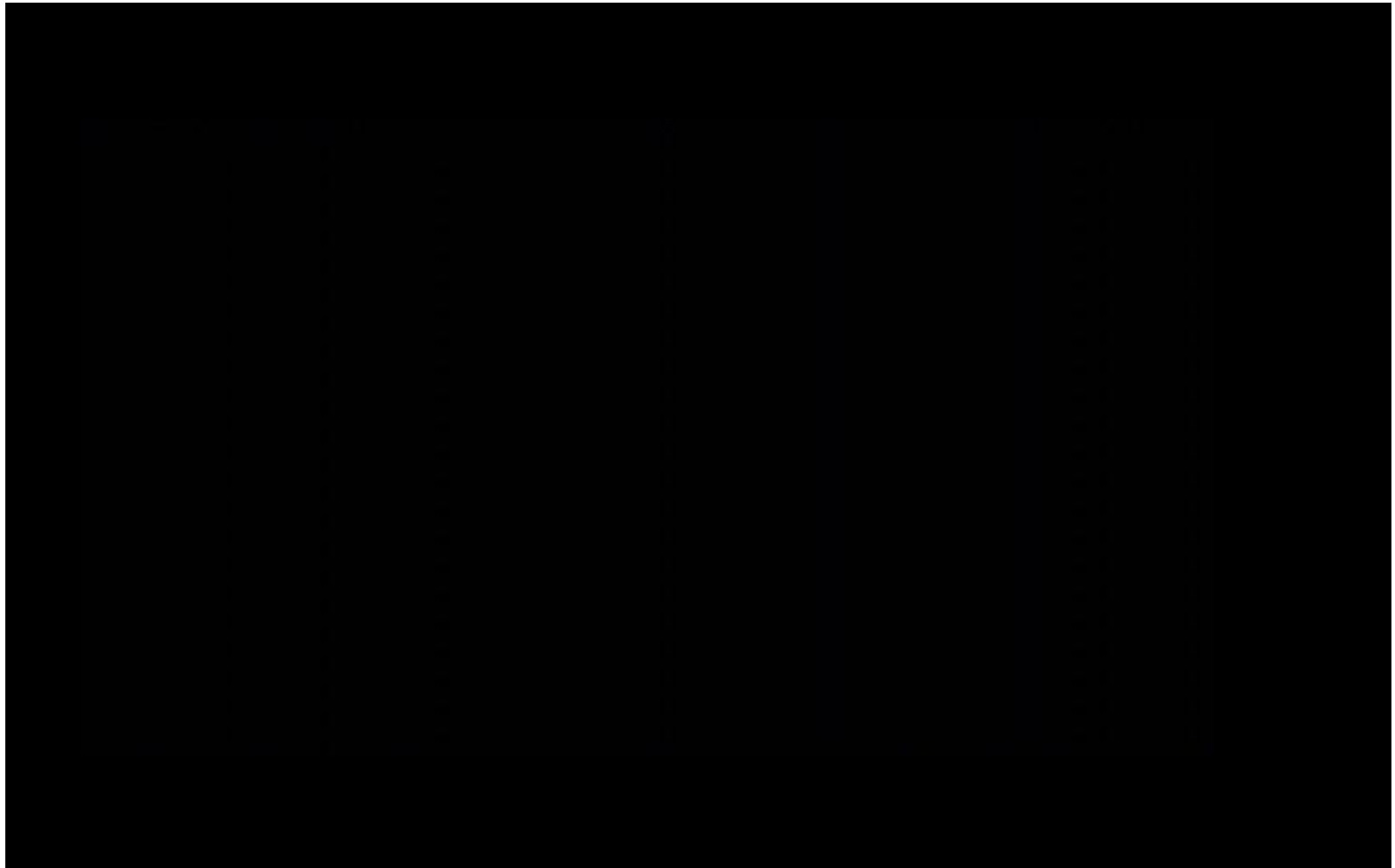


Isolated bubbles disperse into Micro bubbles when hitting Vortex Preformer stage



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

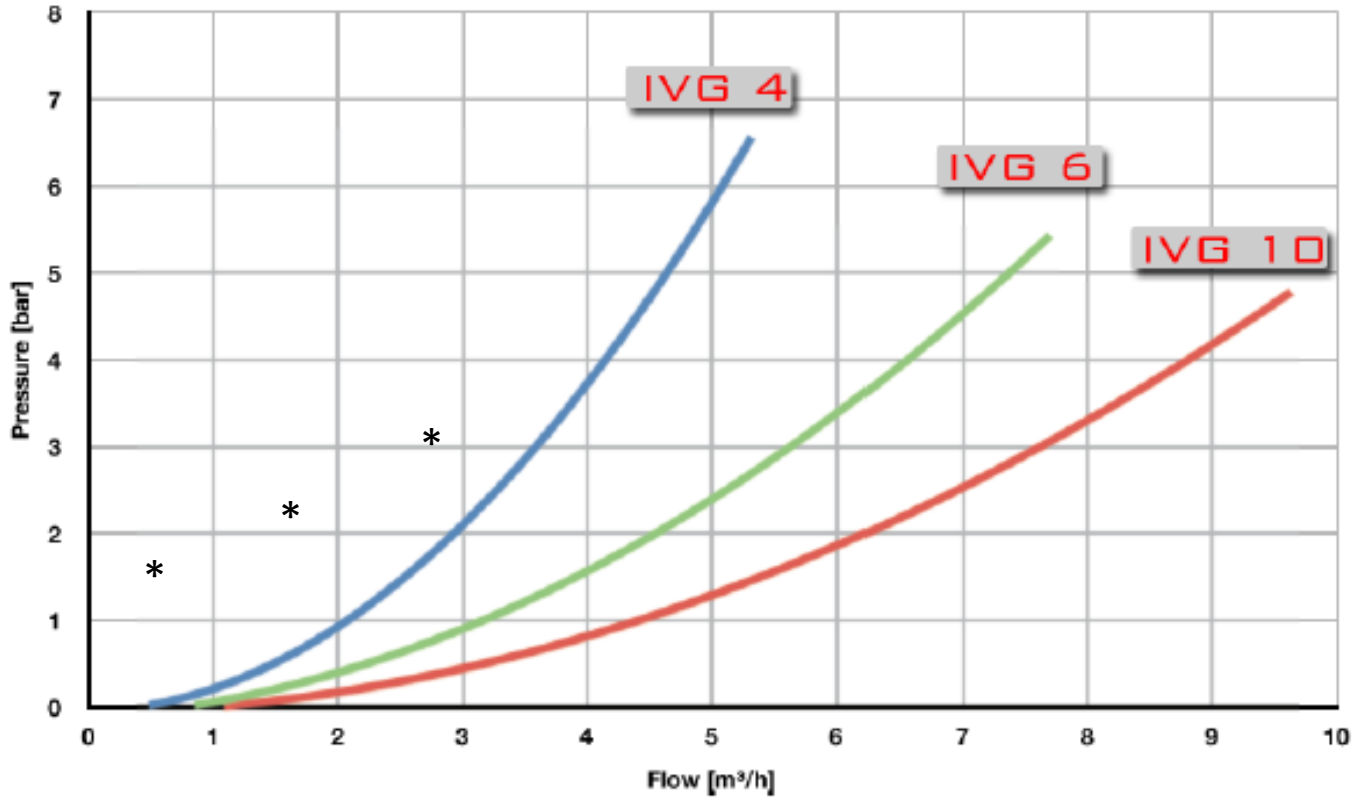




Please click center screen



Standard range for wide range of application



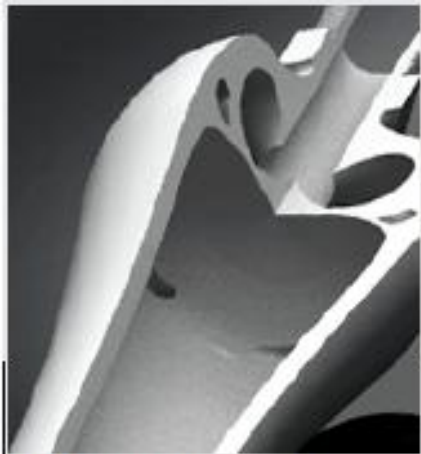
\*IVG 1+2+3 available on request

Input: Pressure (Bar)



Output: Flow (m3/h)





## Watreco IVG 4

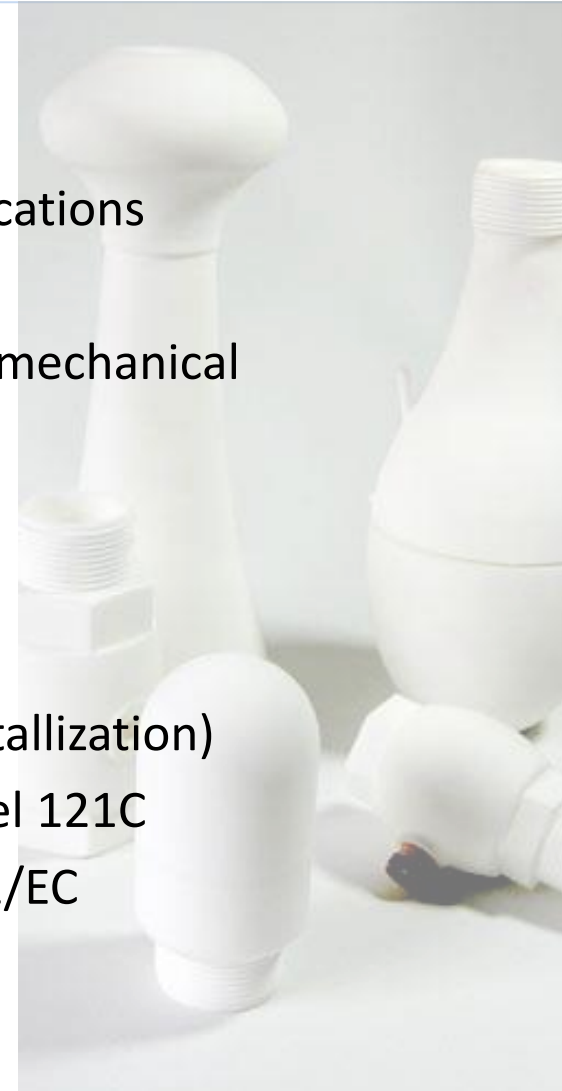
## Watreco IVG 6

## Watreco IVG 10

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



- 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<sup>®</sup> Manufacturing Process





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





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**





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



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



**2009 Clean Tech Award Sweden**

**TZW**  
Prüfende Wasser

**PRÜFZEUGNIS**  
über die Prüfung nach DVGW-Arbeitsblatt W 270 (112007)

**APPROVED**

Hersteller: Watrecor AB, 211 24 Malmö, Schweden  
 Art der Probe: Probeplatten, PA-Qualität (Laserteilp.) (10/11)  
 Bezeichnung der Probe: PA 2200  
 Eingang der Probe: 11.11.2010  
 Probenehmer: Auftraggeber  
 TZW-Az.: MD 255/10

Das vorgelegte Probenmaterial PA 2200 entspricht aus mikrobiologischer Sicht den Anforderungen des DVGW-Arbeitsblattes W 270 (112007).  
 Die Einzelergebnisse sind in einem separaten Prüfbericht zusammengefasst.  
 Die Gültigkeit dieses Prüfzeugnisses richtet sich nach den demorts festgelegten Bestimmungen. Sie sind jedoch spätestens 5 Jahre nach Ausstellungsdatum.  
 Das Prüfzeugnis ist nur solange gültig, wie keine Veränderungen in Zusammensetzung und Herstellungsprozess des Werkstoffes erfolgen.  
 Karlsruhe, den 20.07.2011  
 Dr. J. Klippel  
 Leiter der Prüfstelle

**German DVGW W270 Certification Microbiological Test Compliance on PA2200**

**REALice Approved for Utility Incentives in USA and Canada**

**APPROVED**

**WWF Climate Solver 2011 Nominee**



**WWF Climate Solver 2011 - selection process, step 2**

**Congratulations!**

WWF Climate Solver is a WWF initiative that aims to catalyze rapid growth for climate innovations with a potential to dramatically reduce carbon dioxide emissions globally. There are a great number of innovations - products, systems or services - all aimed at solving this. From the right conditions for development and dissemination, could make a vital contribution in combating climate change. The question is, how do we establish favorable conditions that will enable this to happen?

The WWF climate innovation strategy includes two key activities: (1) Assessments of the conditions for climate innovations in several innovation systems, with a view to enabling the transition - Climate Innovation Systems for a Low-Carbon Future, to be launched June 8 at [www.climateinnovator.org](http://www.climateinnovator.org); (2) Selecting recognition of companies with the technologies that serve as inspiring examples of the potential for climate innovations and the challenges they face.

You have been nominated for Climate Solver 2011 by one of WWF's innovation partners.

Together with our innovation partners, WWF makes an annual selection of technologies with the potential to reduce carbon dioxide emissions by more than 20 million tons per year. As part of the process WWF will evaluate the climate potential of the technology based on its performance, market development, scientific case and. Areas covered are: Living, Moving, Shopping Energy and Cooling. General cooperation will also be required for your technology to be included in the Climate Solver 2011 Award. We'll be an annual selection of technologies in several innovation channels. The technology and its potential to reduce climate emissions will also be presented with your own graphics (not free) at the Climate Solver website - please visit [www.climateinnovator.org](http://www.climateinnovator.org) for examples.

Before we make the final selection of WWF Climate Solver's 2011 the carbon emissions reduction potential of your technology will be calculated by an expert team. You will soon receive further information about this service and we ask you kindly to make yourself and necessary information available to ensure a solid calculation to be produced for your technology.

Following the nomination is expected that you are part of the process that we at WWF are working to support through the Climate Solver initiative. This is an opportunity for you as a climate entrepreneur to be featured by WWF as a pioneer in the transition to a low-carbon future. We're looking forward to learning more about your technology and your experiences as an entrepreneur!

Kind regards,  
 The Climate Team  
 WWF Sweden



**BIOCOMPATIBILITY CERTIFICATE**

**APPROVED**

Technikart: F.A.2380

Spezifikation: ECIS 03401  
 Prüfung: Seite 2, D-42132 Flensburg

Seitens performed: The following checks were performed in order to determine the biocompatibility of the product in accordance with the requirements of EN ISO 10993-1:

**CYTOTOXICITY**  
**SENSITIZATION, patch contact**  
**SENSITIZATION, non-patch contact**  
**INTRACUTANEOUS REACTIVITY**

Results: The product did not show any adverse effects in the studies performed. Therefore, the biocompatibility of the test material was proven.

BSE, BIOSERVICE Scientific Laboratorien GmbH Nienburg  
 Bültingerstraße 6  
 D-22115 Flensburg

Dr. Anders Almqvist  
 Inaugural Leiter / Testing  
 Date: April 15, 2011

**GLP EN ISO 9001**

**Bio-Compatibility test Following EC/ ISO 10993-1**

**IVG Cooling Tower Approved for Utility Incentives in USA**

**APPROVED**

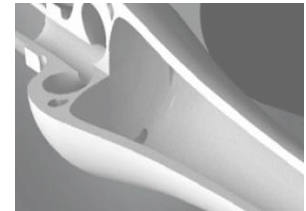
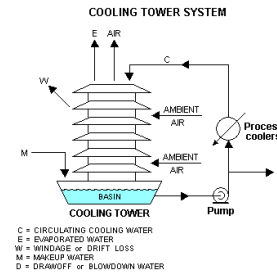
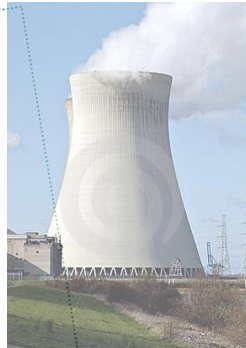
Industry: **Cooling Towers** - oil refineries, chemical plants, power stations, food processing and building cooling etc.

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

In Harmony with Nature

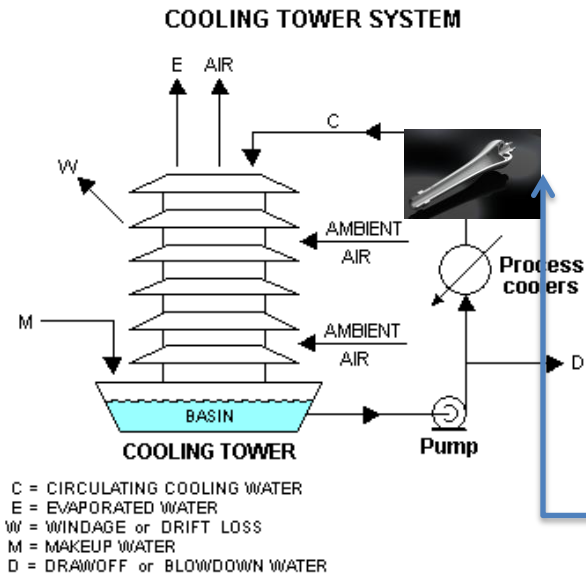


What is a (wet, atmospheric) cooling tower?

A cooling tower is a heat rejection device, which extracts waste heat to the atmosphere through 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)



- **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 Cl<sub>2</sub> 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.



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:

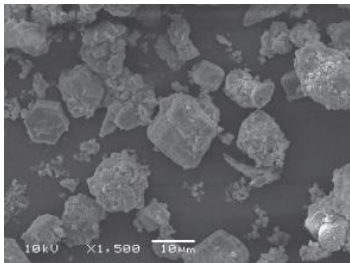
Aggressive Chemicals used to control scaling and corrosion, producing high amounts of chemical Discharge.

### H2O Vortex Solution:

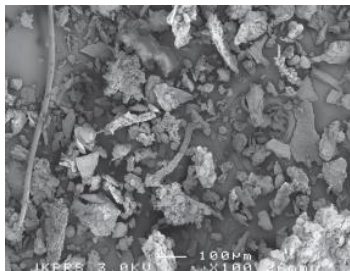
IVG-CT treated water grinds down lime impurities significantly reducing scaling without hazardous Discharge.



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 → Amorphous Structure ( Chaotic Rounded)\*  
Samples taken from Cooling Reservoir after cooling application  
(Powder structure hinders lime scale creation and provides easy removal)

- 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



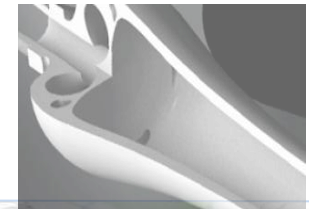
Close relationship with the Customers

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



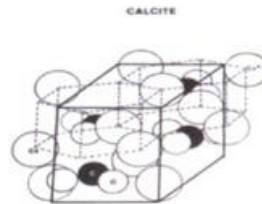
Location : Val des Roses Residence , Luxembourg  
Type of Installation: IVG 6 after fresh water filter (using ground water)  
Anno: Jan 2011  
Application: **Domestic Lime Treatment**  
Problem Statement: Reduce maintenance of water based infrastructure



Extension lifetime of appliances



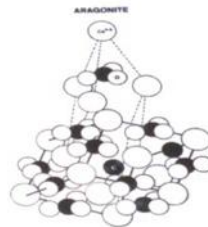
Before VPT



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

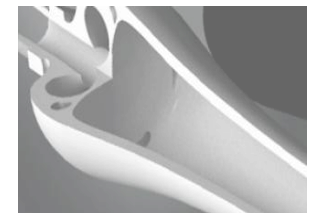
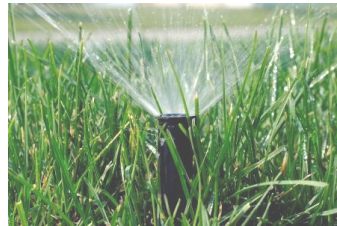
Industry: **Irrigation** - Agricultural Industry

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.

*In Harmony  
with Nature*



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

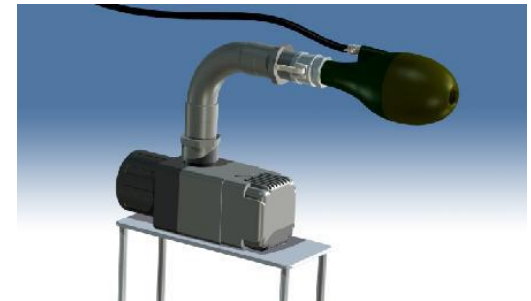
\*Test realized by Food Safety Management Consultancy  
 Dr. Abdulla Ruwaida – detailed report on request H2oVortex

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 below water surface, Low Maintenance



Industry: **Ice Rinks- REALice™**

Application: Complete Water System for Ice Rink Water Treatment

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

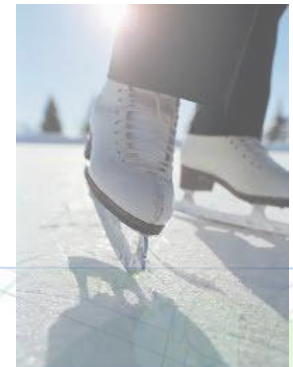
Benefits: Higher Ice Temperature—Less Hot Water Consumption— Less Energy Consumption – Less Lime Scale Formation – Improved Ice Quality

In Harmony  
with Nature



“Savings are significant  
and It contributes to a  
better hockey Game”

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

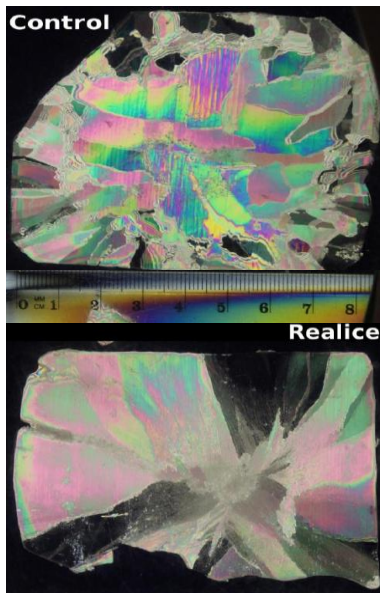


Location : Lulea Technical University Sweden

- Water: Luleå municipal tap water
- Pressure: 4 bar
- Flow: around 1 m<sup>3</sup>/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

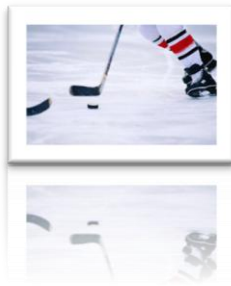
## Multi Arena's + 12000 spectators

- 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



Irrigation = Pure Water



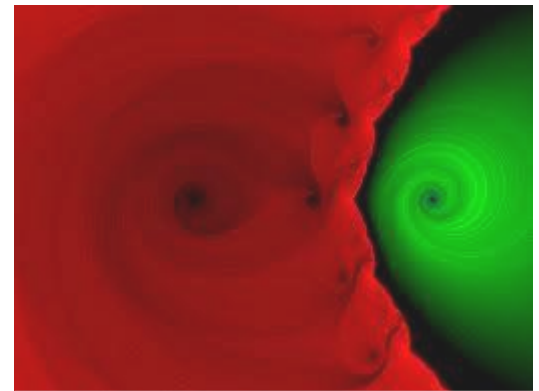
Cleaning = Less water , no stripes



Agricultural = Crop Yield

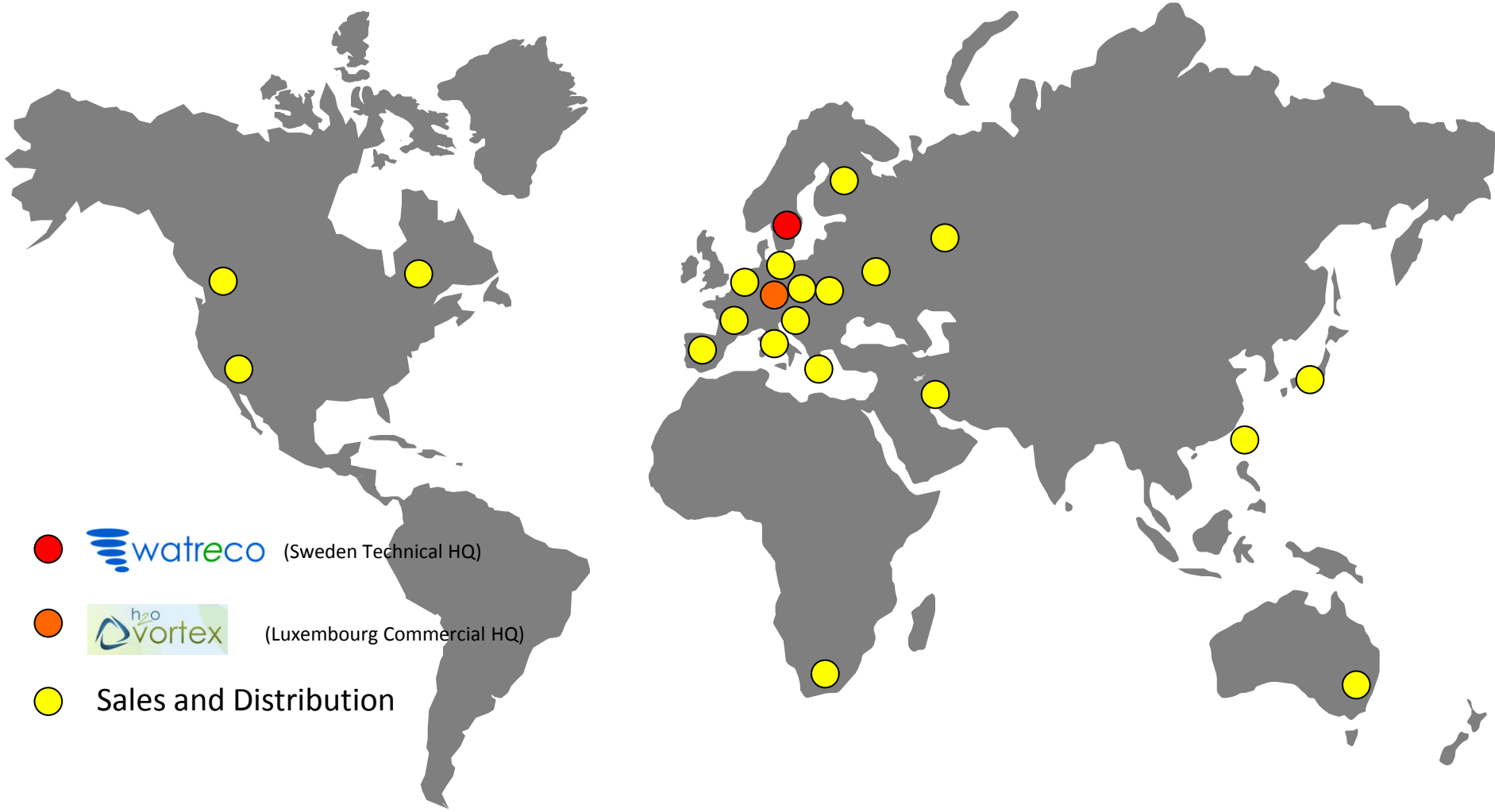


Degassing Liquids = Painting and/or Coating Industry






Mixing = Fast and Efficient





  (Sweden Technical HQ)

  (Luxembourg Commercial HQ)

 Sales and Distribution



Anne-Maree Huxley – Blue Economy Expert

Ph: 03 987 99 88 6 / 0419 798 104

Email: [amh@moss.org.au](mailto:amh@moss.org.au)

Skype: amhmoss

