



## Research Article

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# Integrated Water Clarification by Nature Respect

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## Abstract

A new integrated water clarification for various water matrices and recycling is presented here. The clarification is hermetic and consists of four seamless phases: (1) separation of dissolved ingredients, (2) molecular activation, (3) clarification reactions, and (4) replacement dissolving. It separates dissolved gases like radon, carbon dioxide, hydrogen sulfide and hydrocarbon, and dissolved solids like iron, manganese, calcium, fluorine and phosphorus. The molecules are activated, and clarification reactions happen immediately by suction or feed of clean air, oxygen or ozone. The clarified water is aerated or oxygenated right after clarification. All this happens within a second or few seconds depending on water volumes to be clarified. The integrated clarification is since water itself is pure, it just picks up and transfer's easily heavy load. In the natural water cycle the water gets rid of its load by vaporizing. The integrated clarification separates the load such a way that the most of it can be removed and recycled. The treated water can be recycled and discharged into nature with full respect for nature. The treated water can be led to the natural water cycle by spraying it on ground and plants for solar vaporization which means climate cooling, and load of the oceans can be reduced significantly. Probably evenly distributed large area water evaporation would reduce environmental extreme phenomena.

Health and wellness impacts of clean air can be dissolved into the water, and further transferred immediately in bio systems in wet contact. Comparable iron gets rusted right away in this treated water, but it could take years in dry air.

The new integrated water clarification is performed in flowing condition in a tube by kinetic energy. Gases and possible additives are sucked by a vacuum caused by a symmetrical nozzle design of two curved flow channels. It reduces consumption of water, energy and chemicals. The integrated clarification can be applied in several applications of small and large scales.

**Keywords:** Water Clarification, Water Treatment, Water Oxygenation, Water Purification, Water Recycling, Particle Separation, Pharmaceuticals Removal, Radon Removal, Water Disinfection, Natural Water Refreshing, Exhaust Gas Collection

## Introduction

Present water treatments need a new perspective and environmental respect. In the present water cycle the seas and oceans are rubbish dumps. Rain and waste waters with their load are led or pumped thousands of kilometers as fast as possible into the huge rubbish dumps through the huge underground sewer network. Climate cooling by water evaporation is reduced to negligible. Water and ingredients recycling is little. Present technologies and increasing power consumption in wastewater treatment create unsatisfied results. Further, the sewer network causes serious floods. Many serious problems, disasters and serious microbe growth can be avoided by the water clarification and wide area water buffers with solar evaporation. Water and natural water cycle are necessary for the bio systems as well as the climate balance.

Integrated water clarification process, design criteria, related devices and some practical case studies are presented here. The clarification consists of four seamless treatment phases and as the fifth step a firm gas bubble generation in the flow as follows:

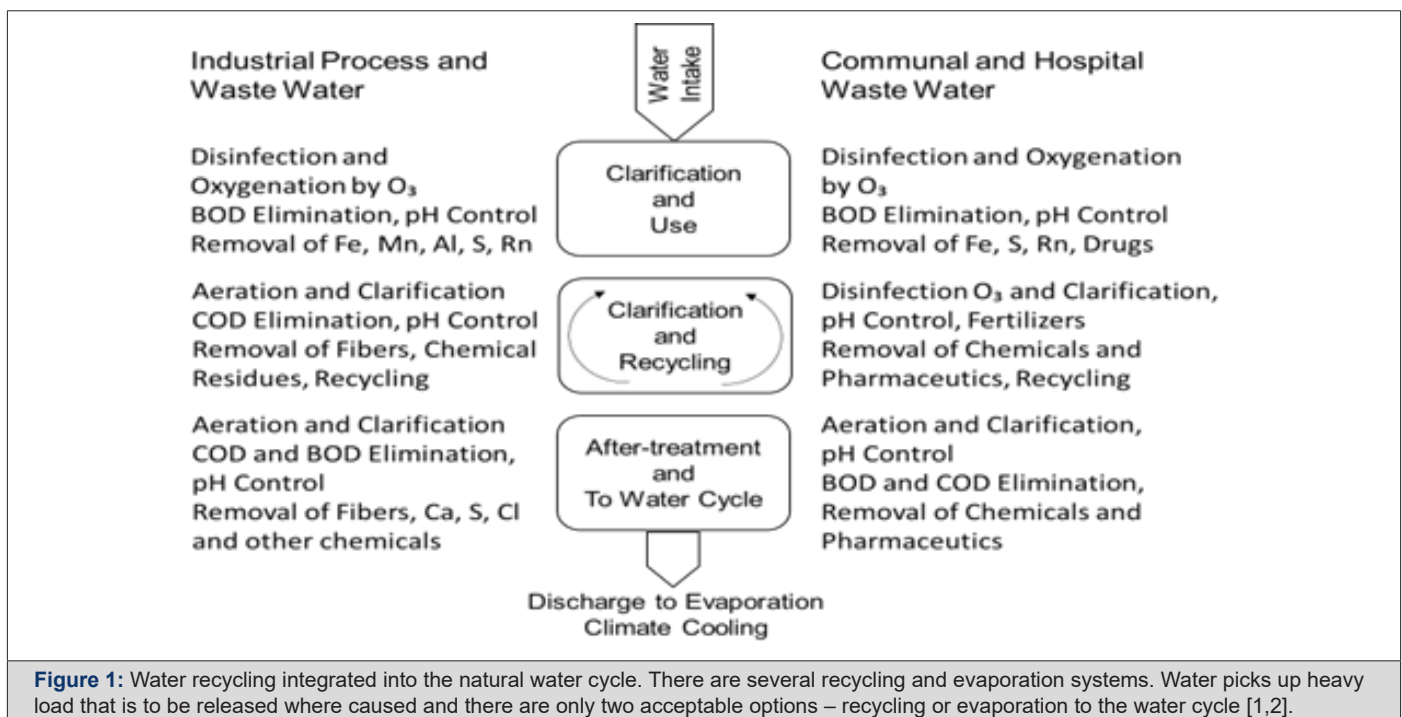
- i. Separation of dissolved ingredients
- ii. Activation of molecules
- iii. Clarification reactions
- iv. Replacement dissolving
- v. Bubble generation in water flow

There have been and are still the following guiding principles on the development and related research:



- i. Water itself is a pure substance that picks up easily heavy load and it can be purified by releasing the load.
- ii. Water is present everywhere and it performs the largest transportation system in the world.
- iii. Water is spoiled within seconds by human, but its clarification takes months and lot of power, why?
- iv. The clarification is to be well controlled and hermetic.
- v. Water purification is to be combined with other water processes like together with hydro power, fountain and ships.
- vi. The treated wastewater is to be discharged into the natural water cycle in the way of climate and nature wellness
- vii. Water recycling is to be maximized in use with the lowest energy consumption and heat generation.
- viii. The treated wastewater is to be reused for climate cooling like solar evaporation.
- ix. The solution is to be economically competitive, and its life cycle concerned.
- x. Man has caused many mistakes and malfunctions in the natural water cycle that should be identified and concerned.
- xi. Natural energy, e.g. potential and direct solar energy is to be utilized (Figure 1).

Figure 1 summarizes the development principles. The Integrated Clarification fulfils these development and design principles in several areas but it needs further development and research in many challenging applications. Separation of dissolved ingredients functions well but to remove these is challenging in certain substances like chlorine and salt.



## Integrated Water Clarification

The new hermetic water treatment process called OxTube and some of its applications are presented briefly here. Focus is set on water purification, wastewater clarification, recycling and impact transfer via water in wet contact. However, integrated clarification is suitable for treatment of all the kinds of water matrices. OxTube Machine presented in Chapter 3 is the basic water treatment device and module that can be modified easily for various tasks, water matrices and installations, and it fulfils the guiding development principles set in Chapter 1 which is the most important. Further, experiences on high impact transfer of the treated water on to biologic tissues in wet contact are presented briefly.

In order to clarify water all, the way the following main criteria are identified:

- i. Dissolved ingredients should be separated, and molecules activated first in the clarification process.
- ii. Other molecules present should be activated too or filtered out before the integrated clarification depending on the case.
- iii. Waste waters content of various solids and chemicals distributed unevenly that should be considered in early phase in the integrated clarification process
- iv. Clarification gases should be fed and mixed evenly to ensure high collision probability of molecules.
- v. The clarification should be well controlled, and all kinds of disturbances should be eliminated in the clarification process.
- vi. It's desirable to refresh the water after clarification reactions by oxygenation or aeration.
- vii. Removal of gases and particles should be considered after the clarification.
- viii. A dirt-free system and good maintainability should be considered.

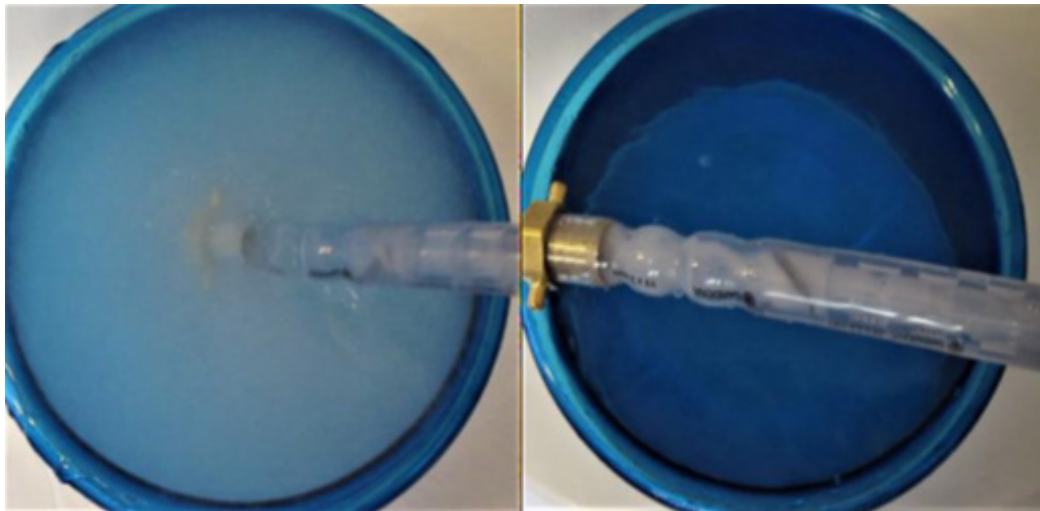
The following solutions of several alternatives were developed after analysis and test runs:

- i. The new nozzle with curved water channels was identified the best solution to fulfil separation, molecular activation, gas suction and mixing in one.
- ii. The curved channels generate pressure difference in the water flow divided into two, and a vacuum pocket is created in middle of the nozzle zone.
- iii. The pressure difference and vacuum pocket separate and

activate ingredients dissolved in the intake water.

- iv. The nozzle structure of two or more curved channels must be accurately symmetrical.
- v. Figure 2 shows visibly efficiency of the separation and activation as well as clarification with Swiss Alpen household water

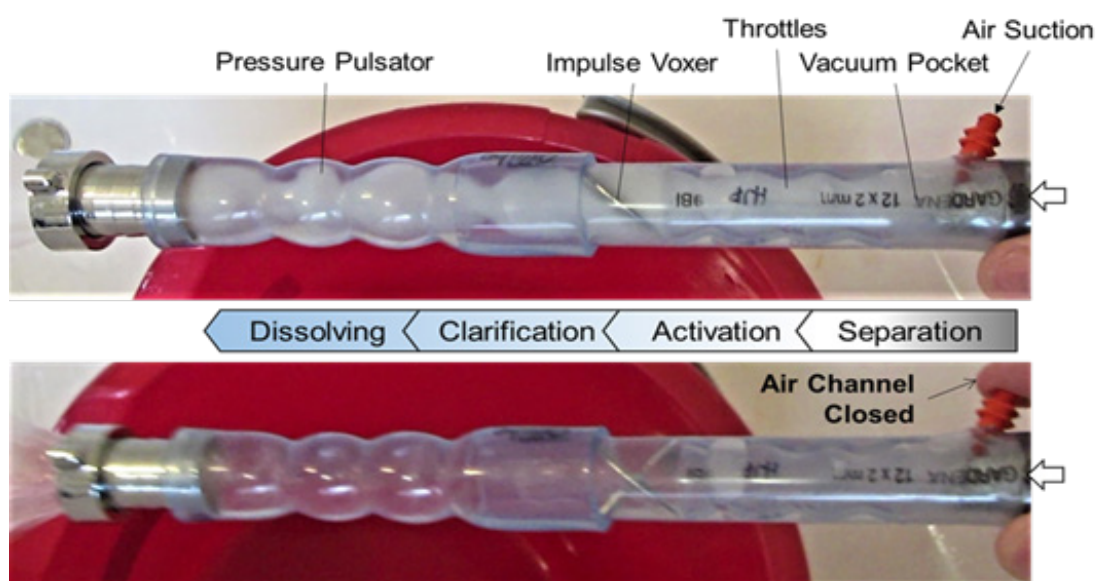
The channels are designed in such a way that there are no discontinuities that might cause disturbances in the clarification and dirt sticking in the nozzle.



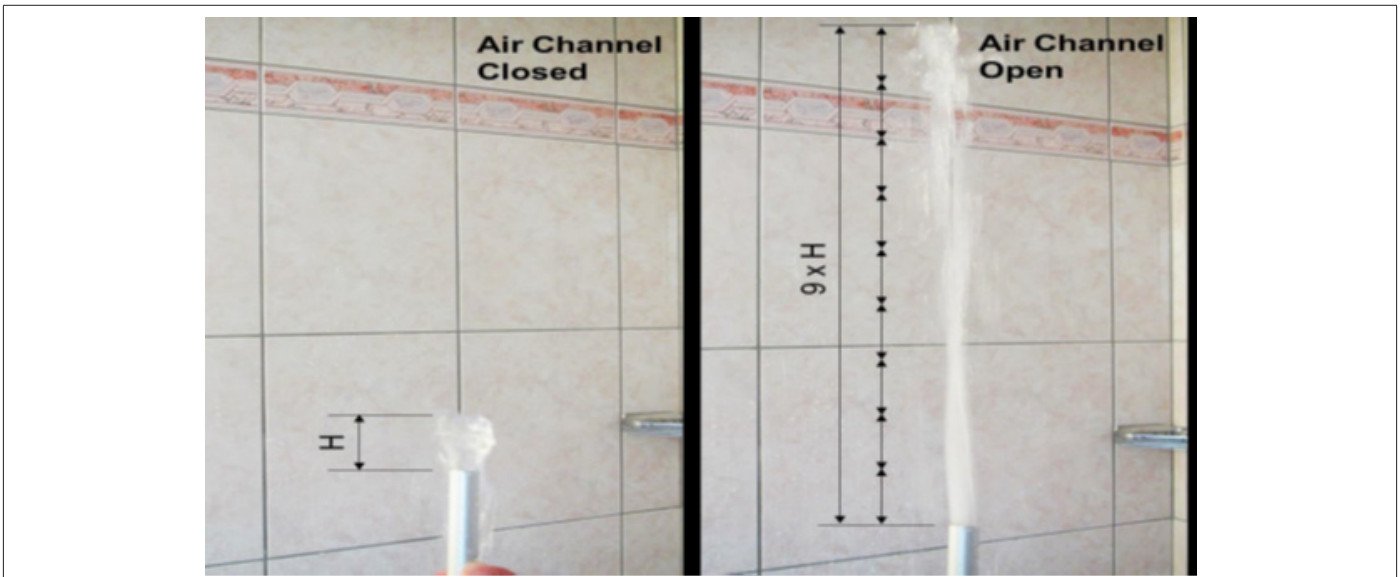
**Figure 2:** Efficiency of OxTube Integrated Clarification with air; Left Swiss Alpen tap water when only the soluble ingredients separation and molecular activation performed, right the integrated clarification at the same condition. The separation, activation, clarification and replacement dissolving are performed seamlessly within a second in OxTube [1-3].

The vacuum pocket sucks gases and possible chemicals and mixes them effectively and evenly in the water flow. Figures 3 and 4 illustrate the effective suction and even mixing. The mixture of water and air is evenly foggy as can be seen in Figures 2 and 3. Spray of

the mixture of water and air is firm and coherent as it can be seen in Figure 4. Air suction is great, it can be over ten times higher in volume than the water flow, and the gravity decreases respectively. No additional energy is needed.



**Figure 3:** OxTube Integrated Water Clarification illustrated visually with air suction. The integrated clarification is performed within less than a second [1-3].

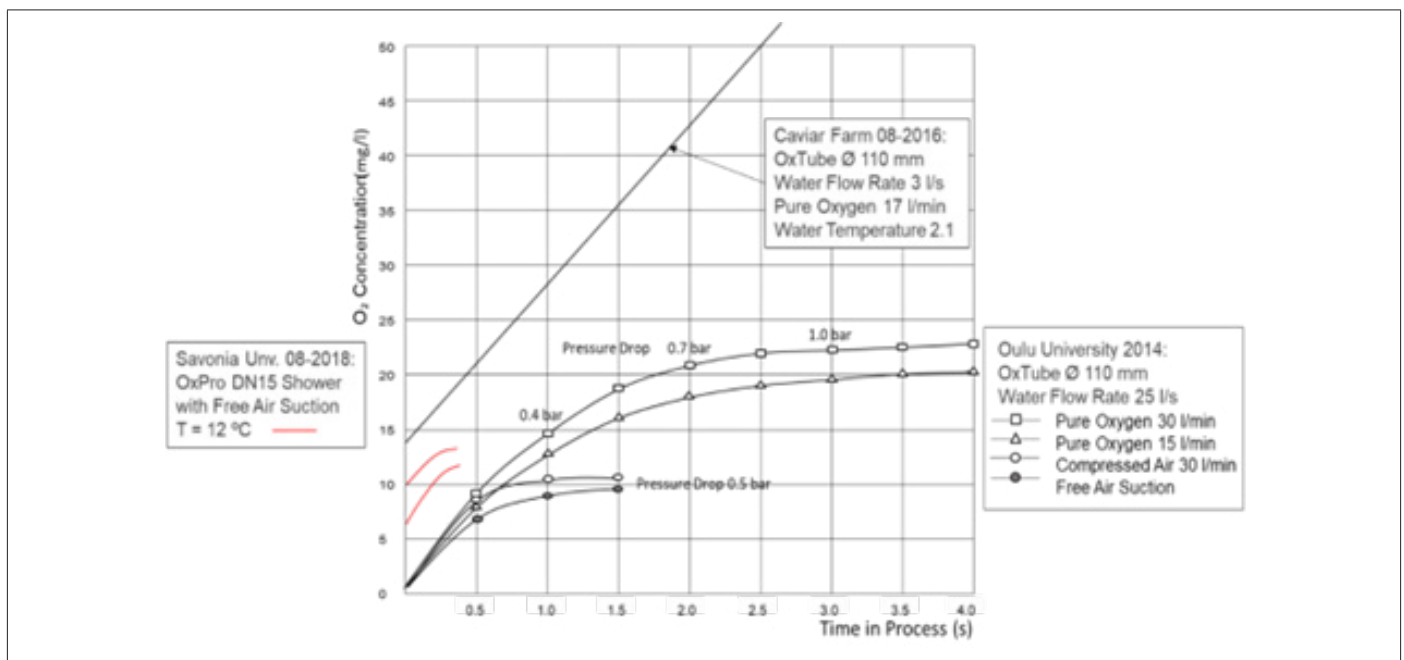


**Figure 4:** Performance of OxTube Integrated Clarification in gas suction and mixing as well in clarification and replacement dissolving is great and efficient. No additional energy is needed in the integrated clarification. Height of the mixture is nine times higher than the plain water has in the exact same condition of water intake [1]. Energy consumption of fountains is reduced to one third.

### OxTube Machine

To optimize the total solution according to challenging customer needs and concerns of various water matrices a modular structure of the system is applied. The same modules are applied in various contexts and customer satisfaction with nature respect. OxTube Machine is the key module in the integrated clarification with low power consumption. The treatment doesn't need any additional energy, but side processes like ozone and chemicals generation and feed might need power. Some solutions installed in pressurized piping might need compressed air. However, this is possible to avoid by the system design. OxTube Machine performs seamlessly all the clarification phases illustrated in Figure 3.

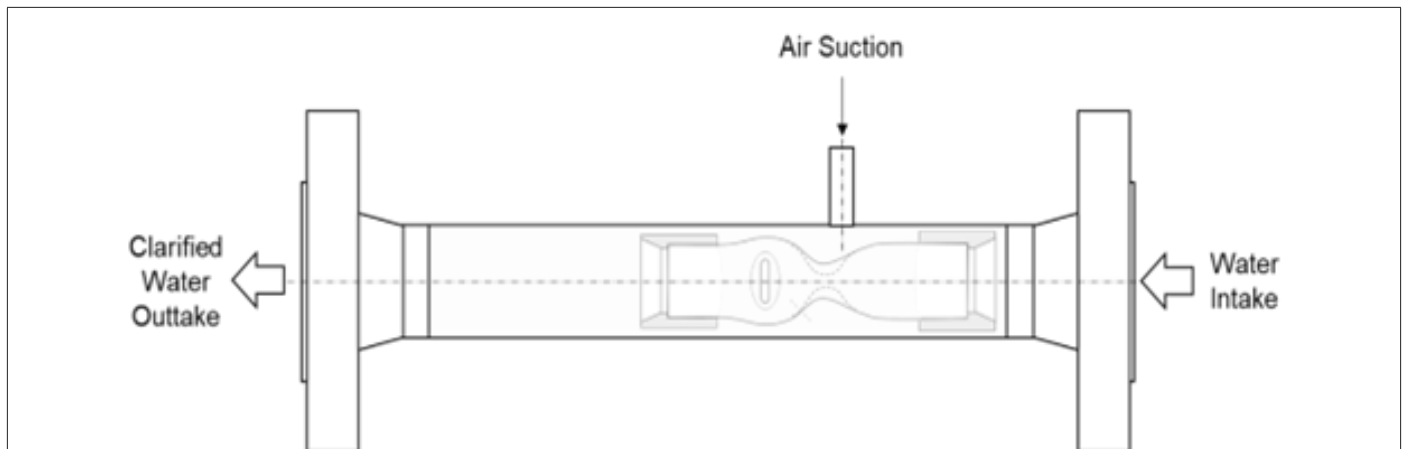
Bubble generation and mixing with the water is visualized in Figure 4. Height of the outtake spray increases nine times when the air channel is open. Gravity of the mixture turns respectively light in the nozzle. The spray of the mixture stays coherent all the way up which is an essential feature of OxTube Machine. Figure 5 shows the oxygenation efficiency of OxTube Machine at early-stage development [4]. Since 2016 separation of dissolved ingredients has improved and gas suction increased by factor of 5. Losses are measured today in terms of mass flow due to huge gravity drop and change from incompressible to compressible liquid in the nozzle zone. The mass flow losses are measured to be less than 2 percent.



**Figure 5:** Oxygenation efficiency of OxTube Machine in early stage development [4].

OxTube Machine is presented in Figure 6. It consists of DuOx Nozzle, air suction nipple, outer tube and fitting flanges. In the small sizes the flanges are replaced by standard thread fittings. All the fittings are metal-to-metal tight fits, there are no individual

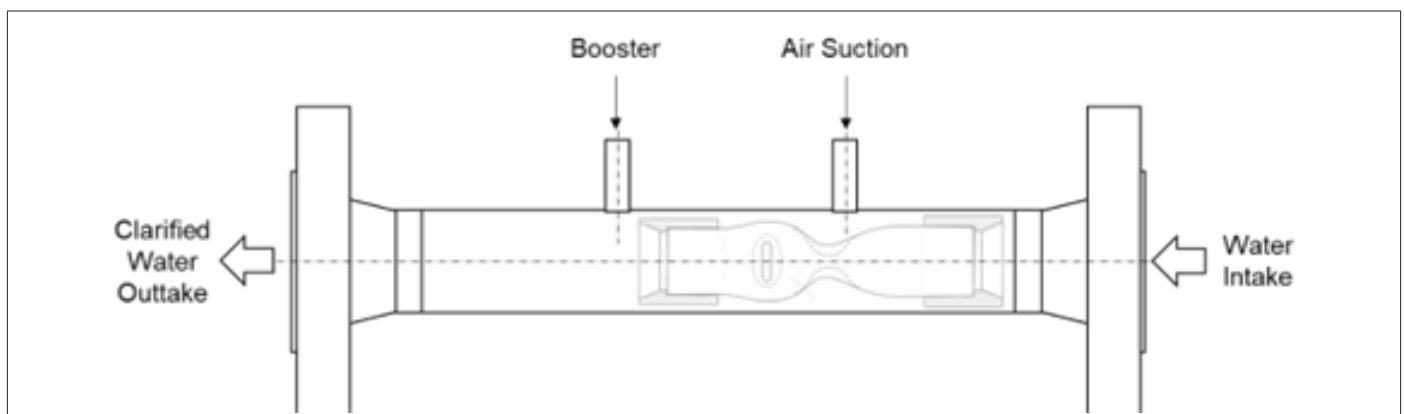
seals at all. Welding is minimized, only the flanges have to be welded to the outer tube. The structure is very compact and easy to keep in good condition.



**Figure 6:** WOXTube Machine with gas and chemicals suction is compact including standard fittings. It can be installed in various water treatment systems. Pressure norm is up to PN40 [1,2].

OxTube Machine is easy to modify and optimize for various water matrices and treatments. Figure 7 shows the Machine modified to realize heavy gas removal and water clarification in one. There

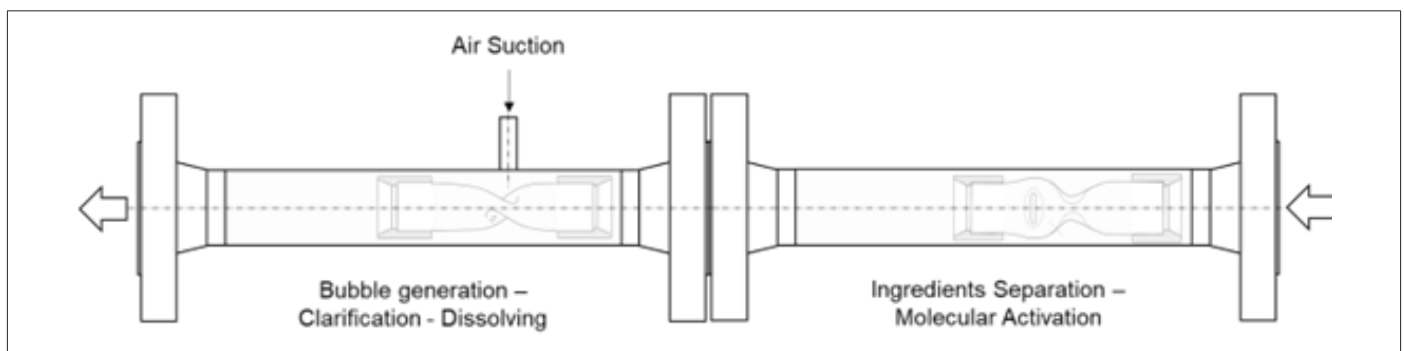
is a booster nipple for pressured air feed that removes separated heavy gases like radon and carbon oxide.



**Figure 7:** OxTube Machine with suction and booster nipple. The module is the same as in Figure 6 added by Booster nipple [1].

Two OxTube Machines in serial would combine so that the first one performs separation and activation, and the second one clarification, dissolving and bubble generation, Figure 8. Clarifica-

tion performance is improved particularly in very challenging cases. Further, a booster can be applied to the second machine when heavy gases are involved in the integrated clarification.



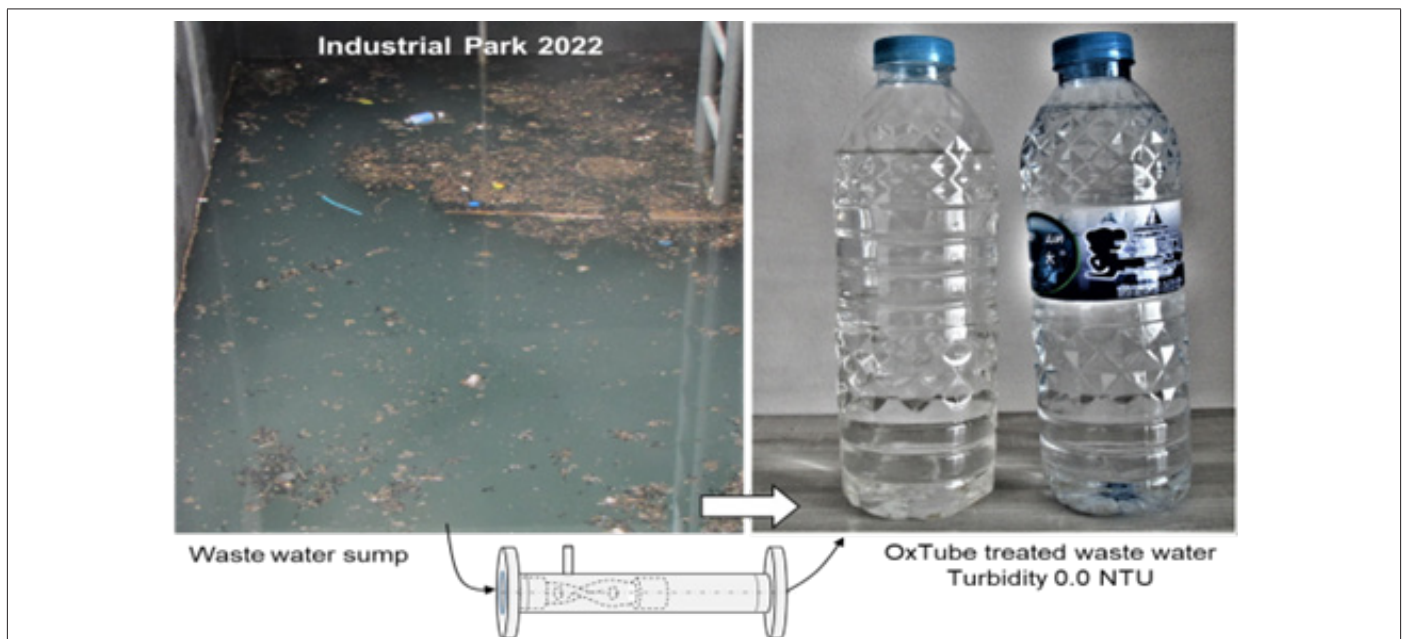
**Figure 8:** Combination of two OxTube Machine, the first one in line is responsible for dissolved ingredients separation and molecular activation, and the second one bubble generation, clarification and replacement dissolving [1,2].

There are many other possibilities to figure various combinations of the same modules to create the best and fastest solution to meet environmental and economical requirements. Clarification, disinfection and oxygenation of a water matrix can be combined in one OxTube Machine by ozone or mixture of ozone and air feed. The growing environmental problems, microbe variation and growth, and drug residues, are eliminated at the same time with water clarification.

OxTube Machine separates dissolved ingredients but to remove them from the mixture needs further attention. As said OxTube Machine generates huge number of overdosed bubbles by gas suction and clarification reactions which can be used for flotation. Collision probability of particles and bubbles is high, and attachment is iden-

tified to be good, so flotation is a natural way of particle removal, it's a build-in feature. Particle attachment happens in OxTube Machine and Fitting Modules before the flotation cell, and efficiency is improved all over. All the filtering methods can be applied in particle removal after the separation and clarification.

Figure 9 shows the efficiency of the integrated clarification according to a hundred real test runs completed with industrial wastewater. Turbidity of the clarified wastewater turned to 0.0 NTU within retention of 30minute. Only OxTube Machine, a pump and an open outtake vessel were used, no filters. The treated water was identified recyclable for industrial purposes. To recycle it for household purposes needs further investigations and verifications.



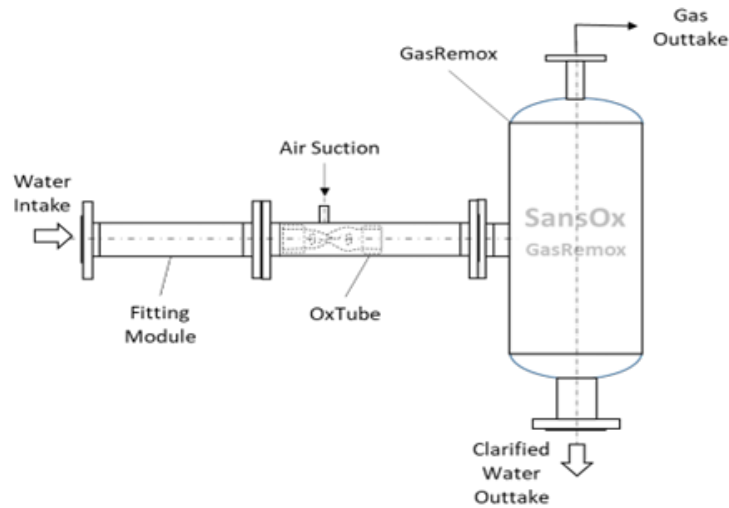
**Figure 9:** OxTube test runs of an industrial waste water resulted turbidity of 0.0 NTU. The clarified water is recyclable in industrial process use [1,2].

## Water Treatment Unit

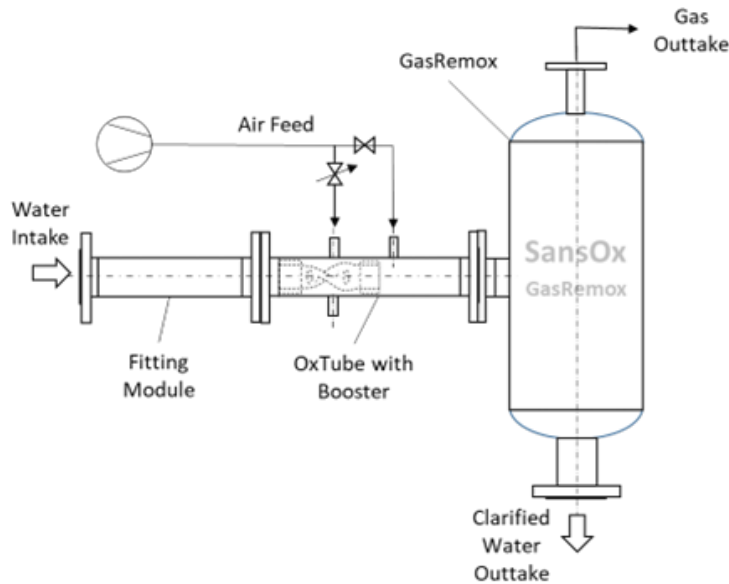
There are many ways and combinations to apply integrated water clarification technology and removal of separated water load. The basic Water Treatment Unit called WTU is presented in Figure 10. It consists of OxTube Machine, Gas Removal GasRemox and Fitting Module. It is developed for industrial process waters, intake water from lakes and groundwater wells, and pre-treated communal waste waters. All kinds of OxTube Machines and modular combinations can be applied in WTU. Only the most challenging water clarification cases are presented here. Disinfection of various water matrices including communal and hospital wastewater can be disinfected by feeding ozone instead of air. Table 1 presents results in the case of disinfection of hospital wastewater. Microbe reduction of 100 percent was achieved together with clarification and oxygenation of over  $20\text{mgO}_2/\text{l}$ . Ozone residues were measured negligible. Heavy gas removal facility is presented in Figure 11. It is applied in radon gas removal in intake of ground water. Performance of the Rn removal can be seen in Table 2. Two WTU facilities with a

compressor were installed in the present ground water intake after the pump. The intake water is clarified and aerated at the same time with Rn removal.

OxTube efficiency in removal of residues of pharmaceuticals and some chemicals from a city wastewater is presented in Table 3 including comparison to two present systems. Pharmaceutical residues are a fast-growing disaster in natural waters and ground. About 90 percent of these residues were split, clarified and removed only by one run through OxTube Machine to an open vessel without any filters. Two runs result in a 99 percent reduction. The city wastewater was clarified and oxygenated at the same time with removal of the drug residues. The present wastewater purification systems separate only 1/4 of OxTube performance. There are many chemicals used for decades and led into the nature and food chains like DDT, aldrin, chlordane, chloroform, hexachlorobenzene. The present treatment systems are not able to eliminate these chemicals like drug residues (Tables 1,2,3).



**Figure 10:** Water Treatment Unit for the most of water integrated clarification cases. It consists of OxTube Machine, Gas Removal GasRemox and Fitting Module. Microbe reduction of 60 percent was achieved with air suction and 100 percent with ozone feed [1].



**Figure 11:** Water Treatment Unit of heavy gas like Rn and CO<sub>2</sub> removal. Compressed air is used in separation, heavy gas blow-up and water clarification [1,2].

**Table 1:** Disinfection efficiency of the Integrated Water Clarification of OxTube: 100% Reduction of E. coli and MS2 achieved with O<sub>3</sub> feed of 2l/min within 0.7second, oxygen concentration raised over MR 20mgO<sub>2</sub>/l, no significant ozone residues/Savonia University of Applied Sciences in Kuopio [5].

Disinfection of Hospital Wastewater /THL Summary April 3, 2018												
Sample	E. coli PMY/ml	Log-red	Reduction %	MS2 PFU/ml	Log-red	Reduction %	T °C	EC uS/cm	pH	Turbidity NTU	O <sub>3</sub> Res mg/l	O <sub>2</sub> mg/l
Test Water	2			1			12,8	283	7,73	0,68	0,03	10,26
Inoculum	2500000			870000								
0 mgO <sub>3</sub> /l	1700000		32,00	340000		60,92	12,4	285	7,88	0,46	0,02	11,65
1,43 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	999999994	<2 (MR.)	>5,27	>99,9995	13,2	285	7,81	0,31	0,10	> 20
1,27 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	999999994	<2 (MR.)	>5,27	>99,9995	12,6	294	7,83	0,27	0,14	> 20

1,11 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	9999999994	<2 (MR.)	>5,27	>99,9995	12,9	288	7,73	0,44	0,10	> 20
0,95 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	9999999994	<2 (MR.)	>5,27	>99,9995	14,3	279	7,84	0,37	0,10	> 20
0,79 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	9999999994	<2 (MR.)	>5,27	>99,9995	14,0	289	7,85	0,44	0,08	> 20
0,61 mgO <sub>3</sub> /l	<0,001 (MR.)	>9,23	9999999994	<2 (MR.)	>5,27	>99,9995	14,0	287	7,74	0,40	0,07	> 20

**Table 2:** Radon gas removal by two WTUs with compressed air and Boosters from a ground water intake. The WTU concept is presented in Figure 11 [1].

Water Flow	Date of Sample	Monitoring Data					Rn Removal Bq/				
		Pressure psi					Raw Water	Treated Water	Reduction Bq/l	Reduction %	Acceptance
		Pump out	OxTube 1	OxTube 2	Distr. Line	Δ					
62.5 m <sup>3</sup> /h	1809-19	60	52	48	60	0	55	9	46	83.6	Passed
	1909-19	60	52	48	60	0	50	8	42	84	Passed
	2309-19	60	52	48	60	0	53	4	49	92.5	Passed
	2409-19	60	52	48	60	0	52	5	47	90.4	Passed
	2509-19	60	52	48	60	0	51	4	47	92.2	Passed
	2609-19	60	52	48	60	0	47	5	42	89.4	Passed
	3009-19	60	52	48	60	0	43	8	35	81.4	Passed
	0110-19	60	52	48	60	0	52	7	45	86.5	Passed
	0210-19	60	52	48	60	0	45	6	39	86.7	Passed
	0310-19	60	52	48	60	0	47	6	41	87.2	Passed
	0710-19	60	52	48	60	0	57	8	49	86	Passed
	0810-19	60	52	48	60	0	56	6	50	89.3	Passed
	0910-19	60	52	48	60	0	50	5	45	90	Passed
	1410-19	60	52	48	60	0	42	6	36	85.7	Passed
	1510-19	60	52	48	60	0	52	6	46	88.5	Passed
2810-19	60	52	48	60	0	50	7	43	86	Passed	
Requirement							52	11		79	

**Table 3:** Removal of pharmaceuticals and some other substances from the purified city wastewater of Kuopio Finland with OxTube Integrated Clarification treatment within a second. Complex molecular structures of pharmaceuticals are split in separation phase before activation and clarification [3,5].

Pharmaceuticals and other substances	OxTube Ozone Treatment			Present Method 1		Present Method 2	
	Initial ug/l	Residue ug/l	Reduction %	Residue ug/l	Reduction %	Residue ug/l	Reduction %
Cetirizine	5.8	0.006	99.9	4	<20	4	<20
Benzotriazole	2.8	0.896	68	1	63	2	<20
Furosemide	1.8	0.054	97	1.4	<20	1.4	<20
Hydrochloricazide	1.8	0.162	91	1.4	<20	1.4	<20
Diclofenac	1.5	0.004	99.7	12	<20	1.2	<20
Lamotrigine	1.4	0.756	46	1.1	<20	1.1	<20
Losartan	1.2	0.005	99.6	1	<20	1	<20
Losartan	1.2	0.246	79.5	0.7	<20	0.7	<20
5-methylbenzotriazole	0.83	0.191	77	1.4	<20	1.4	<20

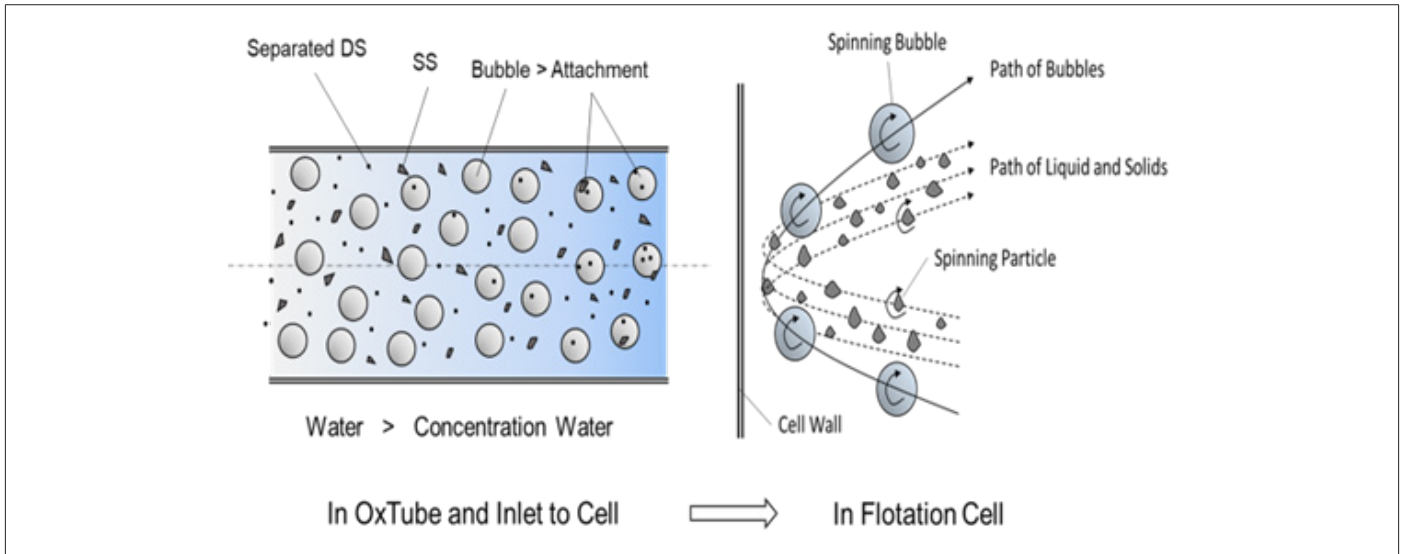


Diatrizoate	0.7	0.147	79	0.6	20	0.5	<20
Atencio	0.56	0.118	79	0.42	<20	0.35	22
Carbamazepine	0.53	0.048	91	0.4	<20	0.4	<20
Clozapine	0.53	0.053	90	0.4	<20	0.4	<20
Bisoprolol	0.5	0.105	79	0.1	77	0.4	<20
Tramadol	0.43	0.043	90	0.3	<20	0.3	<20
Citalopram	0.42	0.013	97	2	<20	0.2	<20
Piperacilin	0.29	0.009	97	0.32	48	0.2	<20
4-acetamidoan-tigrine	0.29	0.015	95	0.15	21	0.15	<20
Azithromycin	0.2	0.012	94	0.14	<20	0.14	<20
Mirtazapine	0.17	0.006	96.4	0.08	31	0.11	<20
Atorvastatin	0.14	0.013	91	0.09	55	0.09	66
Propancial	0.11	0.01	91	0.09	<20	0.09	<20
Quetiapine	0.11	0.006	95	0.08	<20	0.08	<20
Naproxen	0.1	0.02	80	0.07	<20	0.07	<20
Desicratadine	0.081	0.022	73	0.1	25	0.09	33
4-formylamino-antipyrine	0.077	0.022	71	0.04	52	0.06	<20
Bezafbrate	0.069	0.014	79	0.01	78	0.05	<20
Fluvastatin	0.068	0.011	84	0.07	26	0.08	<20
Metronidazole	0.064	0.035	45	0.04	23	0.06	<20
Sotalol	0.064	0.01	84	0.06	<20	0.06	33
Sulfamethoxazole	0.063	0.011	83	0.05	<20	0.05	<20
Ketoprofen	0.059	0.042	28	0.03	62	0.02	80
Sertraline	0.06	0.011	79	0.03	<20	0.03	<20
Sulfadiazine	0.042	0.013	70	0.03	<20	0.03	<20
Clarithromycin	0.033	0.011	68	0.03	<20	0.03	24
Ramipril	0.031	0.008	74	0.02	<20	0.02	<20
Amiloride	0.023	0.014	38	0.01	<20	0.01	<20
Raxithromycin	0.008	0.003	62	0.01	<20	0.01	<20
Xylometazoline	0.013	0.002	86	0.006	<20	0.006	<20
Warfarin	0.007	0.02	<20	0.02	24	0.02	<20
Caffeine		0.018	<20	0.018	<20	0.011	52
Verapamil		0.01	<20	0.01	<20	0.01	24
<b>Total Drug Emission Load Reduction</b>	<b>24,162</b>	<b>3,202</b>	<b>86,75</b>	<b>17,194</b>	<b>28,83</b>	<b>18,317</b>	<b>24,18</b>

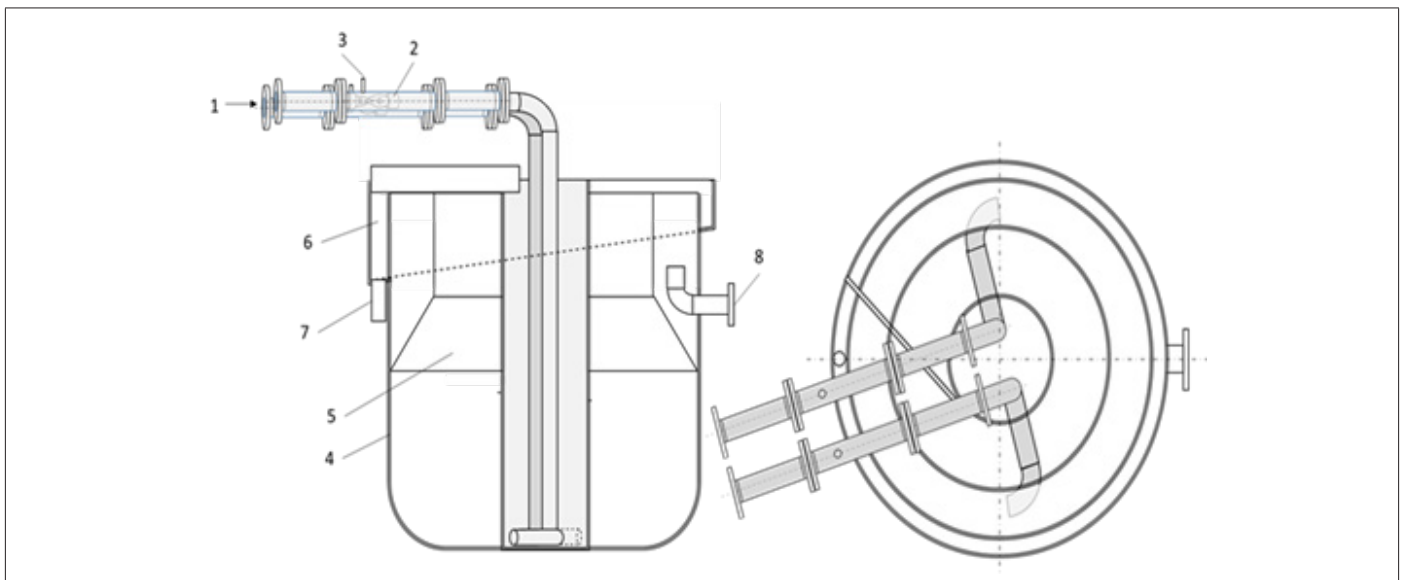
## Combined Water Clarification, Disinfection and Particle Removal by Flotation

OxTube Machine can be integrated in flotation systems like Vox-Flot as shown in Figure 13. OxTube Machine generates a lot of bubbles and even mixture of water and bubbles in the hermetic tube condition as illustrated in Figure 12. Meeting probability of particles and bubbles is high, and particle attachment happens already in OxTube and the following tubes before the flotation cell [3,6,7]. A two head vortex flow of water and bubble mixture is generated in VoxFlot flotation cell that improves particle attachment and extends bubbles path to surface. The Bubble Trap speeds the vortex

flow and pushes out a foam with particles on to the water surface. The clarified water is taken out behind the bubble trap where no bubbles nor particles exist. Water clarification, disinfection, oxygenation and particle removal by flotation can be combined by feeding ozone or mixture of ozone and air through the OxTube. The bubble flow through OxTube Machine and two head vortex flow decrease the unit size significantly compared to a straight flow flotation with diffusers. Chemicals feed if necessary is completed directly in OxTube Machine. Further, there are no rotational components involved. These features mean reduced capital and operational costs [7] (Figures 12,13).



**Figure 12:** OxTube Machine generates bubbles and even mixture in the hermetic tube condition. Meeting probability of particles and bubbles is high, and particle attachment happens already in OxTube and the following tubes before the flotation cell [6,3,1].



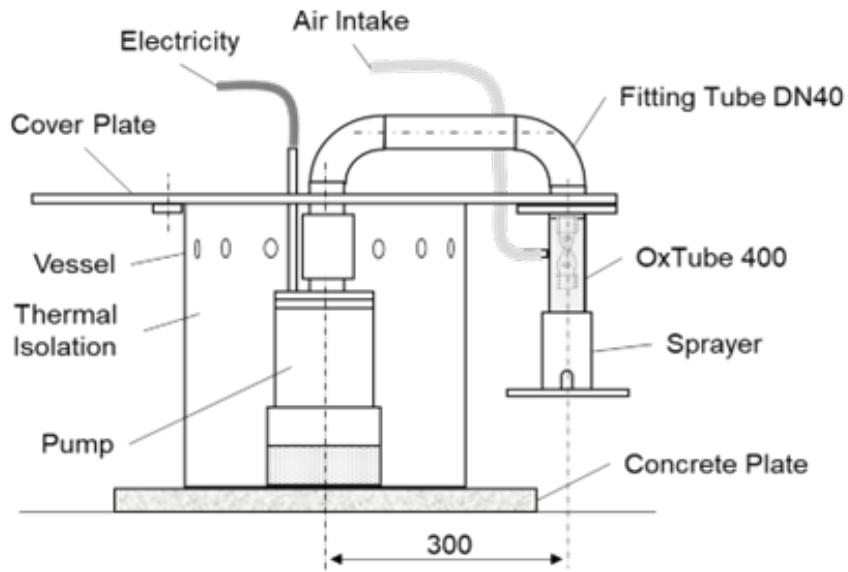
**Figure 13:** VoxFlot Combined Clarification, Disinfection and Flotation; 1. Water intake, 2. OxTube Water Clarification, Disinfection and Bubble Generation 3. Gas Intake, 4. Flotation Cell, 5. Bubble Trap, 6. Foam Collector, 7. Foam Outtake, 8. Clarified and Disinfected Water Outtake. The gas fed is ozone or a mixture of air and ozone. VoxFlot is presented in references [6,1,7,1].

### Natural Waters

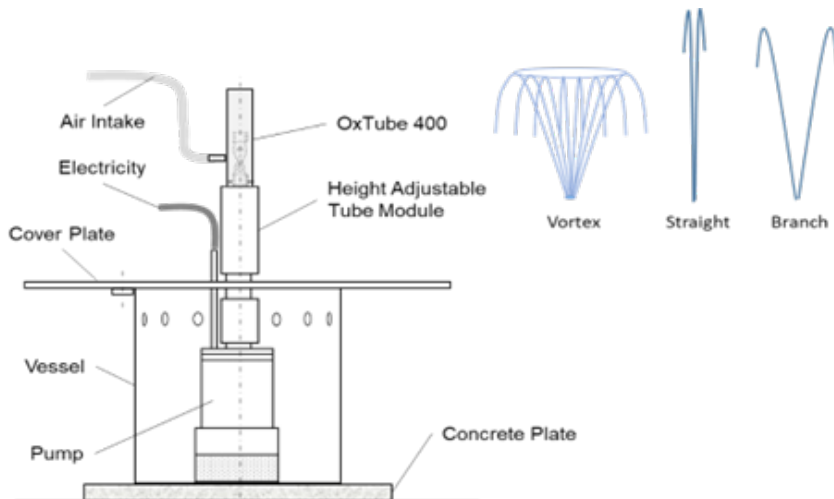
Natural waters are wastewater sumps already today. Rivers, channels, dikes and drainpipes function as drains of the nature water cycle. Ponds, lakes and seas function as sewage basins. Pollution load of waters has increased and become more hazardous particularly in population centers where the water and rain are led fast to drains and sewage basins of the water cycle. Energy consumption of wastewater treatment has increased significantly but it is deficient. Evaporation is reduced tragically which means significant loss of climate cooling power, more floods and increased desert area. It's urgent to refresh waters and food chains. The OxTube Machine and its integrated water clarification presented in Chapter 3 can be utilized easily in many ways and positions of the water cycle. Two examples are presented in Figures 14 and 15 just giving an

idea how easy it could be. Water Clarifier has all the functions of Ox-Tube Machine. The combined water clarifier and fountain performs integrated water clarification and landscaping by water spray. Both examples are easy to install and movable. Their energy consumption is found negligible. Figure 16 shows clarification of a lake of 2.3 km<sup>2</sup> with a small clarifier ClariOx shown in Figure 14.

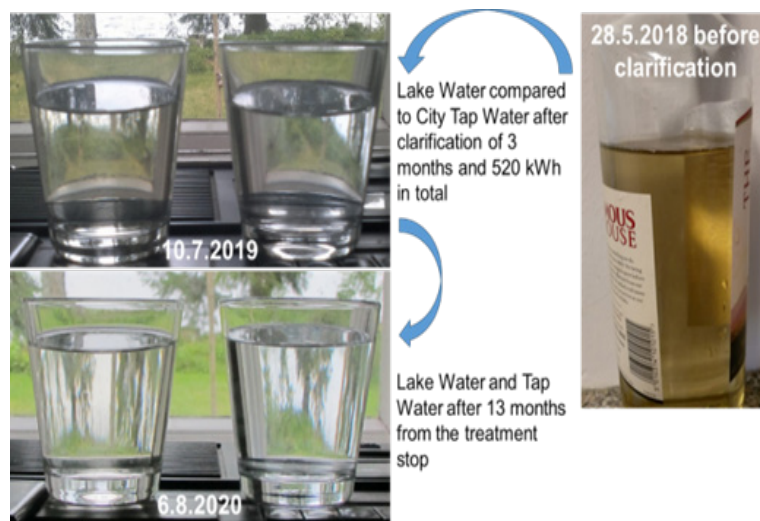
Further, the integrated water clarification can be applied in all kinds of water transport vehicles without any additional energy consumption. Kinetic energy of the vehicles in motion can be used for the treatment. Flow resistance can be kept the same or even reduced by proper design. A ship would clean sea water in depth of 4meter 240 000 cubic meters a day. Figure 17 shows an integrated ship installation.



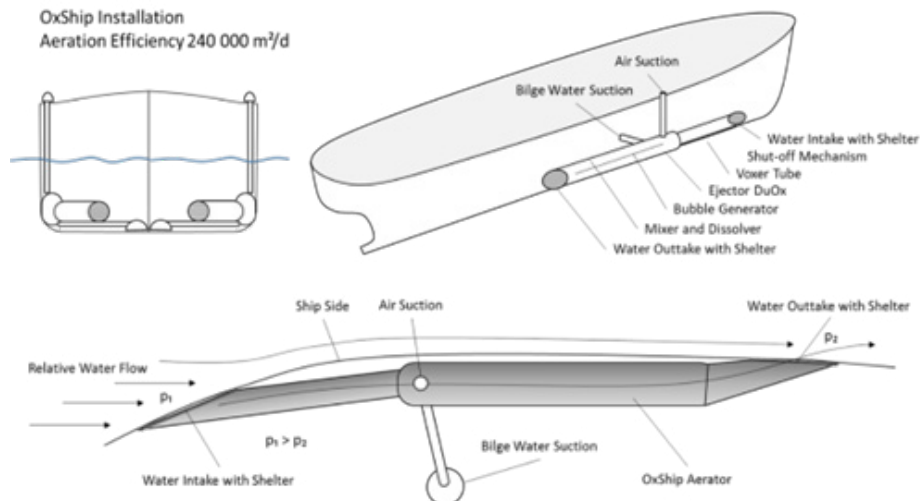
**Figure 14:** Water Clarifier ClariOx refreshes waters by clean air without chemicals. Energy consumption is little [1,2].



**Figure 15:** Combined water clarification and fountain [1,2].



**Figure 16:** Clarification of a lake of 4.5km long and 0.5km wide. Water became clear, and plants and food chains recovered.

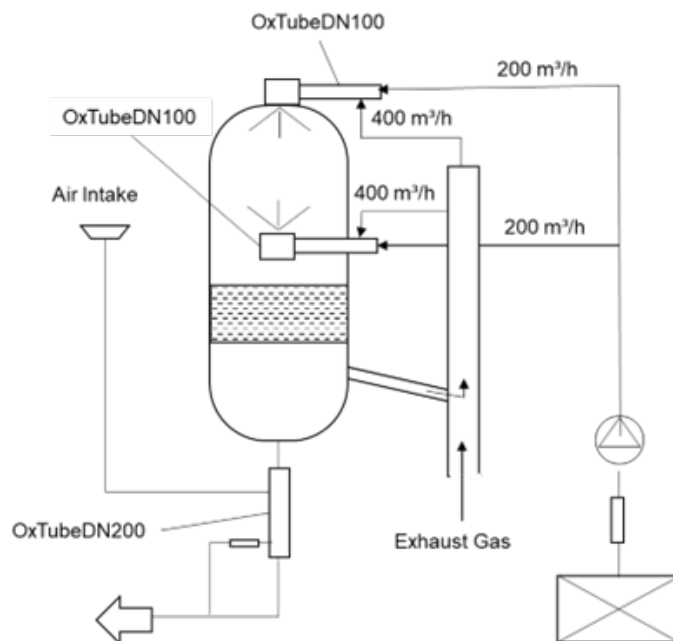


**Figure 17:** OxShip installation. A cruising ship can clarify sea water of 240 000m<sup>3</sup>/d in depth of 4m. without additional fuel consumption [2].

### Exhaust Collection and Recycling

OxTube Machine can suck and mix gases in the water stream over ten times of water in volume NTP. Exhaust gases can be sucked and mixed in water of flowing tube condition and sprayed for col-

lection and recycling. Figure 18 presents an exhaust gas washing and collection system for ships that can be engine based. The system can be scaled down to small ships and boats, and even to trucks and cars. The water can be clarified and recycled back to the washer or to the sea water clarification OxShip presented in Figure 17.



**Figure 18:** OxTube sucks and mixes exhaust in the water stream by forming a foggy mixture in the hermetic tube condition.

### Air Impacts Transfer on Tissues in Wet Contact

Over 500 individuals and professionals have been using OxPro treated Water for various tissue deceases and orally to improve metabolism. In the treatment only air as clean as possible was sucked by the special nozzle of OxPro, mixed and dissolved in the Water. As said the Water transfers impacts of air immediatly into tissues like skin, nails and hair. And orally to metabolism in the wet contact. Further, surface tension of the water treated is reduced which enhances the transfer of air impacts into tissues. Naturally, other sub-

stances than air can be dissolved in the water and improve transfer of impacts. Selected case studies and related stories are presented here briefly.

#### Helen's Painful Legs

Good morning Juhani, Helen phoning. Hi Helen, I hope you are well. I feel wonderful after a very good sleep which I haven't had for a long time, for a couple of months, thanks for your Water you gave it to me yesterday, that is a miracle I would say. I just waxed my legs with Water last night before going to bed, the skin turned to a bit

slippery and steady immediately, but the best, I slept well and late, no pain in my legs I have had every night at around three a clock. It's glad to hear Helen, I thought something special had happened to you because you sounded so excited. I talked to my doctor already and said to him 'Doctors, you make people sick and despairing with your care and medicaments, yesterday I met an engineer, he just prepared The Water from tap and air with his tiny tube and these ills vanished immediately by waxing it on my legs'. I would say, he turned to silence and hurt. Helen, please follow your doctor's instructions despite this positive progress. Juhani, no help of this long-lasting care, I'd like to continue with The Water definitely, I have suffered the disease and bad sleep long time. Let's do so, you wax your legs with The Water at bedtime and use doctor's medicaments in mornings. Make a control reservation with your doctor in two -three weeks. Ok, thanks Juhani.

After two and half weeks. Hi Juhani, the doctor said, it looks like the disease has vanished which I knew and felt already. I'd like to continue just with The Water -Helen, please do not skip the medical control. Ok, Juhani. I have a neighbor who suffers dry and cold sensitive skin, no help with the health care, so he tried The Water on his skin, and felt next day much better, he said. Ok Helen, I'll bring to you one of my test tubes you can prepare The Water for yourself and your neighbor in one condition, you guarantee you don't miss any doctorial control. I guarantee it, thanks a lot Juhani. Three months later. Hi Juhani, everything is fine, I am well, and The Tube functions well but it has turned to brown. -I'll come to you and

check it. Helen, the OxPro Tube has oxidized iron present in the tap water. The water piping might be damaged, it should be checked and repaired. Please, call plumber service. The OxPro Tube is fine, I'll clean it out of rust. How is your neighbor today? -He said, no dry skin, nor scarf and the skin are now in winter like before in summer, not cold sensitive anymore.

#### OxPro Water Treatment and Air Impacts Transfer in Wet Condition

OxPro treats the water in flowing condition in its hermetic tube. It splits molecular and ionic structures, activates and separates soluble ingredients in the water, and replaces these with air gases that are sucked by vacuum in the nozzle zone. Figures 19a and 19b illustrate the four-phase treatment of OxPro. The water is cleared, and air gas dissolved in OxPro Tap of 40mm long and Shower handset. Further, a lot of air bubbles are generated and mixed in the water flow. Impacts of air gases are transferred to tissues like skin, nails and hair: and orally to metabolism by the treated water in its wet contact. Impacts of air transfer slowly in dry condition. Iron doesn't rust in dry air but immediately in wet contact of air. The seamless OxPro Process has been verified in natural, industrial, waste as well as tap waters. OxTube Machine can be integrated easily in various devices of flowing water as shown an example in Figure 20. Examples of movable kitchen taps are presented in Figures 21a and 21b. Metal-to-metal fittings are applied meaning no seals, it can be disinfected in high temperature and its life cycle is long.

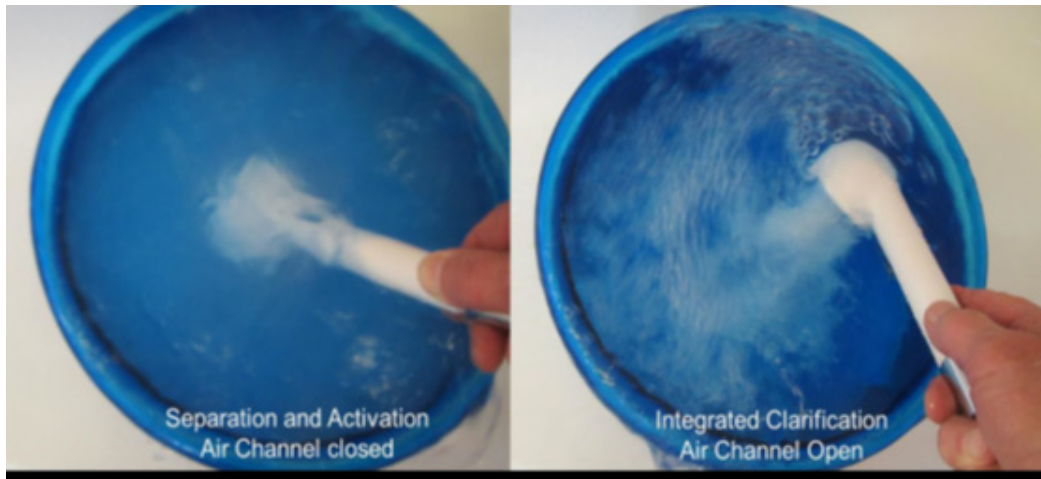


**Figure 19a:** Demonstration of OxPro Tap with Swiss household water. Separation of dissolved ingredients and molecular activation without air suction on the right, and integrated clarification on the left. OxPro Tap is shown in the middle.

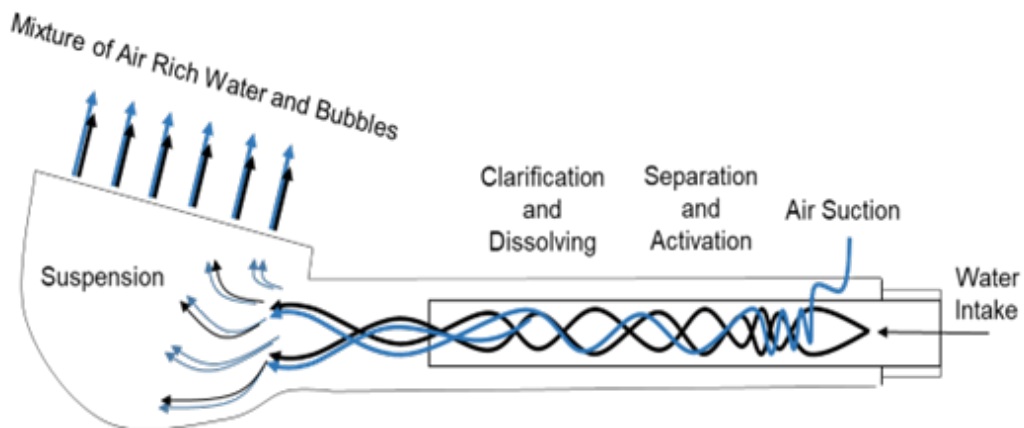
#### OxPro Shower-Secret Weapon of a Finnish Ice Hockey Team

It takes less than a second for OxPro Showers to dissolve useful air gases in water. These air gases, mainly nitrogen and oxygen, clean and care for skin. The water from OxPro Shower feels luxuriously soft, and it may have a huge impact on skin, too. Since the autumn 2018 players of a Finnish ice hockey team KooKoo have been enjoying this new shower technology. The massage therapist of KooKoo players, Teemu Valtonen, has significantly benefited from an OxPro Shower. For years his hands suffered from constant use of massage creams at work. Cream caused rash and little cracks on

his palms. The palms were itching, too. He had to wear hand gloves when working. Valtonen tried to cure his skin with nourishing creams, but that did not solve the problem fully. It is very cold in Finland in wintertime, and that made situation often even worse. But there was a solution coming. The KooKoo team went to practise in Slovenia in the autumn 2018. On the ferry Valtonen met the CTO of SansOx, Juhani Pylkkanen, who had developed a new kind of water technology called OxPro. Pylkkanen explained how an OxPro Shower works and prepared a few bottles of OxPro treated water for the KooKoo team.



**Figure 19b:** Demonstration of OxPro Shower. Separation of dissolved ingredients and molecular activation without air suction on the left, and integrated clarification on the right.



**Figure 20:** OxPro Machine can be integrated in hand and over-head shower devices. The water is clarified, air gases dissolved in it and a smooth spray of air bubbles and water generated.



**Figure 21a:** OxPro Kitchen Tap made of aluminum in use in a famous restaurant. Tight metal-to-metal fittings are applied, no seals at all.



**Figure 21b:** OxPro Kitchen Tap made of plastic.

Valtonen tried OxPro water right away and was amazed at the results.

i. I applied OxPro water to my hands two or three times a day. The itching disappeared immediately.

ii. He wanted to test the effects of OxPro water a bit more. SansOx agreed to send to the team two OxPro Showers to be tested, and Valtonen was given one OxPro Shower to be used at home as well.

Tiny cracks in his palms disappeared as he started using the new OxPro Shower.

i. I don't know why. It has got something to do with this air water!

He takes an OxPro Shower once or twice a day at the moment. His skin is unbroken even if exposed to harsh winter air. There is some drying, though, in the worst spots, but no cracks.

i. My hands have never been in a better condition!

Valtonen is impressed by a two-month trial.

i. I want to keep this shower. It has been very pleasant to observe the effects of an OxPro Shower. I am glad to recommend this to others as well.

The head equipment manager of KooKoo team, Jukka Salminen, has tried drinking OxPro water.

i. I take half a litre of OxPro water per day.

He noticed that the intake of OxPro water increases metabolism significantly, but he hasn't offered OxPro treated water to the KooKoo players yet.

i. I experienced fast metabolism for three or four days, when I started drinking OxPro water. I decided to wait a little and offer this to KooKoo team members only after the season is finished. They will have more time to get used to this.

Salminen has had an OxPro Shower at home, too.

i. A rash on my back has disappeared, and so has the unbelievable itching related to it. I take an OxPro Shower every day, and I must say I am very happy to have tried this.

An OxPro Shower and Water Tube look like ordinary ones. The special features have been built inside the handheld shower unit and water tube respectively. Natural pressure causes suction that brings air into the water current via a tiny air hole. OxPro creates a whirl of tiny air bubbles and water, where air dissolves in water in less than a second. OxPro water feels very soft, and dissolved air gases clean and care for skin, and in oral use improve metabolism. / Interviewed and written by Sanna Vainikainen/.

#### **OxPro at Dila Health Care Center in Lahti Finland**

Four health care cases at Dila Health Care Center in Lahti Finland reported by Hanna Dillström of Dila are briefly described here on the following tables. The report covers the period of the time from November 5 to December 28, 2018, and the study continues (Tables 4-7).

#### **Stella Home Care Services in Lahti Finland**

OxPro water treatment device is being in use for health care and wellness services at Stella. The water was just treated in the OxPro Tube right before use orally and on skin. The impacts according to the notes of a nurse of Stella are as follows:

i. The first feeling in drinking was like well water instead of normal tap water.

ii. In hair washing in morning only one shampoo foaming was enough, and the hair was identified remarkable clean all over.

iii. The hands seem to remain 'comfortable slippery' just washing them only with The Water. It feels as clean as washing with soap.

iv. In the first week I completed three face nurtures with just the OxPro treated water. One was informed and the others were not informed of The Water. All of them wondered right after the nurture, how the face skin can feel softer than before.

Table 4:

Patient 1 age of 57 y	
Identified Disease	Poor blood circulation in the leg, its skin very thin and wounds appear continuously on it. In overall skin and scalp oily, and scalp sweating problematic way
Treatment	The symptomatic leg was treated with OxPro Shower water daily. in addition, the body was showered normal way with OxPro Shower daily. Other treatments were minimized the changes in health condition was observed daily base.
1 to days	Pleasant feeling on skin, no more sting nor burn nor pain on skin, skin became a bit moist
1 week	Skin of the symptomatic leg turned moist and more pleasant
2 weeks	The skin feels better, reaction on freezing weather reduced, not drying as before. Hair turned stronger and softer like washed with lake water.
3 weeks	Need to leg skin liposuction reduced, the skin feels softer
4 weeks	The skin is better, softer and no itch anymore. Hair wash frequency reduced from daily to every third day. Scalp oiliness reduced; hair turned airy.
5 weeks	
6 weeks	The skin better in winter than before in summer, pleasant moist. Hair wash interval of 3 days good. Life quality enhanced significantly.

Table 5:

Identified Patient 2 age of 82 y	
Disease	Face and scalp sore, scaly, dry and red (erythematous)
Treatment	OxPro Shower treatment only ones a week, which means very seldom.
1 to 2 days	No visible impact, it was difficult say feeling in general
1 week	As above
2 weeks	No visible impact identified
3 weeks	The erythematous reduced obviously
4 weeks	The scaly reduced and erythematous decreased further
5 weeks	The scaly reduced further
6 weeks	The skin turned just fine, scaly vanished totally and as well as the redness can hardly be seen anymore.

Table 6: R

Identified Patient 3 age of 42 y	
Disease	Atopic dry hands, cold winter weather and wood grinding dust dry skin more, weather-beaten, and yeast smell identified between fingers.
Treatment	The hands treated by dipping in and rinsing with OxPro Tube air treated water five times a day just after normal hand wash
1 to 2 days	The hands became even more dry a bit, yeast smelled the yeasty hands were treated with dedicated cream
1 week	Yeast smell disappeared, no anymore yeast cream needed, the hands staid dry.
10 days	The yeast vanished, hands still dry due to wood grinding dust, without air water treatment they could be much drier.
3 weeks	to be continued
4 weeks	
5 weeks	
6 weeks	

Table 7:

Patient 4 age of 55 y	
Identified	Oral use of OxPro Tube air treated water, no identified disease.
Disease	
Treatment	Drinking of the air water during work hours in stead
1 to 2 days	Need to go to toilet more frequently for urination
1 week	Improvement of metabolism identified, need to drink the air water also after the work.
2 weeks	Abdominal condition improved and functions became regular. Taste of the air water softer than any other water.



3 weeks	Mucous membranes became softer and meatier.
4 weeks	Feeling higher spirited, improvement of metabolism remained steadily at good level.
5 weeks	
6 weeks	Need of sleep decreased but feeling higher spirited, metabolism regular and improved, mucous membranes became steadily moister.

v. My hairdresser said that my tenuous hair feels somehow better, it looks vital.

vi. I have noticed when drinking the OxPro aerated water I must urinate more frequently than with the untreated tap water.

Various health care and wellness nurtures based on The Water have been continued at Stella Lahti with full customer satisfaction. The Water just by rinsing few times a day at the beginning has removed many occupational skin problems and improved work wellness as follows:

i. Visibly very dry and itching skin of a customer has recovered and became stable when using OxPro Shower daily, skin liposuction is not needed anymore.

ii. The problematic cracking heels of many customers have recovered and become vital.

iii. In the foot cares dead dry skin and indurations look remarkably easy, even themselves, after keeping feet in The Water certain time.

iv. Scurf and itching of hair scalp have vanished always within a week when showered with OxPro Shower. In a few cases itching has recurred when turned back to normal tap water.

v. The hands of the nurses are better, no cracks and no hand cream needed when washing hands with The Water.

vi. Face pack made of powder and The Water is easier to mix and spread, feels different and more pleasant, and looks like it works better.

vii. A customer suffered acne rosacea, she used OxPro Shower daily two weeks, feeling turned well already in two days and the red vanished in a week. She likes to buy such a shower when available.

#### **Attendo Health Care Lahti Finland**

Attendo has tested the OxPro treated water and OxPro Shower in connection with their nurtures and separately as well for about two months with very positive results. People suffering severe deceases have gotten immediate relief from their bad feelings. Recoveries from long lasting deceases have been reported too within the short period of time. As an example, a female of 66 years suffered mycoplasma, and periodical dehydration and ulceration of mucous membranes. She had suffered about a week symptom of mucous membranes in her genital area. Recovery takes time 1 to 2 weeks with normal care. The symptoms such as a hole and particularly urination are very painful. She sprayed her genital area with the OxPro treated water five times within one day, and all the symptoms vanished completely.

#### **Seija, Hospital Laborant in Finland**

She started to use prototypes of OxPro Shower and Tube, can't live without them now. Her dry and scarfing skin have recovered,

and her cracking hands and cuticles became strong, no cracking anymore. Drought and cracks on her heels have vanished for all. The itching on her scalp has vanished, too.

#### **Olli, Engineer in Finland**

I have as well as my wife has used regularly OxPro treated water since 2016 when it was introduced to us by Juhani Pylkkänen in Switzerland. We have enjoyed a lot in drinking The Water as well as making coffee of it. Feeling in mouth is very pleasant with drinking this water and coffee, and the stomach is well. The OxPro Shower is really a device without it we can't live. It follows us everywhere. I do sports actively and take showers at least ones a day, often three times a day. My skin is softer, moister and more flexible with the Air Water than untreated one and need of soap and cream is significantly reduced. I have noticed that the water temperature is adjusted clearly to colder positions, too. As Finns we enjoy sauna whenever it's available. We have identified clearly that The Water provides moister steam pleasant to breathe, and longer time to enjoy sauna pleasure than untreated water. The steam on skin and eyes feels pleasant and somehow slippery. Also I treated our forest pond with SansOx's water clarifier called ClariOx according to Pylkkänen's advice 2017. After two weeks of treatment humus and biomass rose on to the surface all over as a huge blanket. After scraping the floating mass away, which was a quite easy operation, the water turned clear like potable water, the bottom was visible, and the smell of humus vanished in three weeks. The pond water has stayed clear without humus smell, and fishes are well growing visibly fast. Before, since 2000 we have tried to clarify the pond water every summer with a spray aeration method and lime achieving just a little visible improvement.

#### **Tapio, Inventor in Finland**

I have suffered scurf and itching of my scalp almost whole of my 60 years life. I have tried many treatments recommended by medical doctors without any promised changes. Juhani Pylkkänen told me on January 2018 on The Water he developed by accident that could at least bring a pleasant feeling without itching. We enjoyed dinner in a restaurant after a long and tiring meeting, when Juhani proposed to make one bottle of The Water for trial. We had to drink a bottle of wine to get it for The Water, and he just dropped tap water through his small tube device and filled the empty wine bottle. According to his advice I just doused my hair with The Water of about 1 dl and let it dry before going to bed. I recognized after 10 minutes the itching vanished, and next morning an unbelievable feeling without itching I had suffered tens of years. I used The Water the same way after hair wash about then times, and the scalp scarf vanished, no scarf appeared anymore even no use of The Water afterwards. This is a big change, maybe the biggest in my life. The shower device of The Water would be nice to have.

### Afta Recovery, 12-2018 in Switzerland

The painful afta (Stomatitis aphthosa) of 2cm long between gum and cheek on right side below was identified in the morning at 7:30. Treatment with The Water started at 9:30 by teeth brushing and rinsing. The pain reduced immediately. The swelled afta was seen and felt clearly by the tongue. Between 9:55 and 10:17 the afta was treated four times by keeping The Water in the mouth two minutes at a time. The pain disappeared while the swelling felt the same. Between 10:35 and 10:50 The Water was kept in the mouth

two times two minutes at a time. The swelling was reduced to a small streak, no pain at all anymore. Meeting with coffee and lunch between 11:15 to 17:35hrs, no pain nor unusual feeling, only minor swelling felt by the tongue. Between 18:20 and 19:40hrs sauna of steaming and showering with The Water. The Water was kept two times two minutes at a time in the mouth. The afta vanished, it can't be seen nor felt. At 22:50hrs before sleeping The Water was kept ones three minutes in the mouth. The afta was recovered totally (Figure 22).



**Figure 22:** The painful afta (Stomatitis aphthosa) of 2cm long between gum and cheek that recovered in 14h with The Water treatment described above.

By summarizing this case the discomfort of this large and painful after of 2cm long vanished within two hours and the total recovery achieved in 14hours with the treatment of The Water described above. According to literature it takes 15 to 30 days to recover from large aftas like this.

### Ahku, Finland 2017

Ahku had an active keratosis on her cheek that was precursor of skin cancer, Bowen's disease. The diseased skin was operated on, and the surgical scar was treated several times with a dedicated gel. Over six months care the cheek skin was still strongly itching and scaly, and red in surrounding that turned ones a month to a painful bloody scar and further, it dried to a scab that loosed and the scar turned back to itching and scaly condition. Ahku started to take Ox-Pro Shower every day in May 2017 when the diseased skin was in itching and scaly condition as shown in Figure 23a. In two weeks from the start the diseased skin was recovered significantly, inflammation and red were almost vanished, and no itching nor desquamation anymore, Figure 23b. In one month, the diseased skin was recovered, and the monthly cycle of scarf, bloody scar, dried scab, and itching and scaly scar hasn't recurred within the following control period of a year. The condition is good and stable (Figure 23a, b).

### Hairdresser, Lahti Finland

She used OxPro Shower prototype at home and work. Her dry skin and scalp scaling, and itching disappeared within two weeks. Her hair turned visible stronger, and static vanished. She applies The Water for selected customers with the same impacts. The customers have recognized these changes and asked for the OxPro Shower device for private use. The hairdresser and her husband started to use the water orally by drinking and food making, too. The Water tastes better, mouth hygiene feels fresher, and metabolism has turned to regular. Her husband carries now always a bottle or a can with him when away from home.

### Eczema and Herpes Recovery, Switzerland

Figure 24 shows quick recovery of eczema. The treatment of The Water started after one day (24h) from identification of the eczema, and it was fully recovered in 42h just by rinsing it about every two hours during daytime. Several this kind of quick recoveries have been measured, and further, sings of immunity improvement have been identified.

Figure 25 shows quick recovery of herpes. The treatment started after three days from the herpes identification, and it was still in expanding phase. The recovery started in one hour by rinsing, and it vanished fully in 50 hours by frequent rinsing just daytime. Many other quick recoveries of herpes and related immunity improvement have been reported.



**Figure 23a:** Skin after six month from surgery.



**Figure 23b:** Skin after two weeks The Water treatment.



**Figure 24:** Quick recovery of an eczema just by regular rinsing with The Water.



**Figure 25:** Quick recovery of an eczema just by regular rinsing with The Water.

#### **Giovanni, Alps in Switzerland**

He felt pungent pain and itching all over on his arms and legs just after baling and storing dry hay. The pain and itching vanished within two minutes by waxing the skin of his arms and legs with the Water.

#### **Pekka, Borreliose Recovery in Finland**

The second phase of borreliose caused patches on the foot skin, swelling and stiffened foot joints. First the Air Water was spread or tested on one foot only, whereof patches vanished in three days and the swelling decreased as well while the other foot not treated stayed unchangeable. The swelling vanished totally in a couple of weeks. The patches started to appear gradually when the Water was not used, but they disappeared immediately by the retreatment. Pain of the joints gradually decreased, and the joints began to move normally. The daily treatment by just shower and drinking took place for three months in total with some breaks between. Footbath of the cold Water was taken a couple of times at the beginning. The disease healed; no recurrence identified.

#### **Marja, Allergic Reaction on Tap Water in Kuopio Finland**

She was not able to drink tap water at home and nowhere in

Kuopio due to pain and swallow occurred immediately in her throat. After a little drinking, she got red spots on her skin, too. Using tap water for food and coffee was not possible for her before OxPro-treatment. Now she has prepared water for drinking, food and coffee with OxPro-tube from tap two years without any these reactions and anxiety.

#### **Swelling Recovery Within Six Hours in Switzerland**

An unknown swelling and pain occurred on ear and neck area quickly, about within an hour, see the Figure 26 on the left. Movement of the jaw and turning the head became difficult and painful. About a half an hour later from the photo on the left dinking of The Water was initiated with amount of two glasses. After 10 minutes the pain disappeared, and some feeling of warmth occurred. The swelling started to reduce in one hour and after five glasses of The Water. Movements of the jaw and head returned to normal in two hours. In six hours and after seven glasses of The Water the swelling, pain and feeling of the warmth disappeared, see Figure 26 on the right. No medical care was used. No sign of the disease was identified for the next few days at a medical doctor. The Water can transfer the impact of air via metabolism. A doctor suspected an allergic disease.



**Figure 26:** Swelling recovery within six hours just by drinking seven glasses of The Water.

### Seija, Aquarium Improvement in Finland

Seija has used OxPro-tube and shower for her wellness successfully over two years. She got the idea to test the treated water in her aquarium. She mixed-in the OxPro treated water about one third of the aquarium volume. In a couple of days, she noticed the fishes turned brighter in color and more social in behavior, and further, algae disappeared, and plant leaves turned from dark brown to green. It's said, tap water would kill fishes.

### Gerda, Austrian Lady

The Lady had suffered her stomachache for nearly a year long. She got some help from medical care for the ache, but she lost weight and felt sick and powerless. She heard about The Water and wanted to dry it. The ache vanished in a day and recovery of her stomach started gradually. She felt well for a month but turned sick again being without The Water. She tried the Water again and her wellbeing became back. Now she has OxPro Tap installed in her kitchen water supply. She drinks tap water daily and uses it for cooking. The stomach problem has vanished.

### Summary

OxTube Integrated Water Clarification was found to meet the environmental and economic guiding principles and criteria listed in Chapter 1. It has been applied successfully in removal of pharmaceuticals, radon gas, calcium, manganese and iron from various water matrices, and disinfection with ozone of a hospital wastewater. More than 40 different pharmaceutical residues in total over 24µg/l were removed 90 percent by OxTube Machine with Integrated Clarification within a second in one through run [5]. Radon removal from 57 to 8Bq/l is achieved continuously in five installations of ground water intakes at Water Plants. Disinfection of hospital wastewater with ozone resulted in 100 percent microbe reduction, and clarification and oxygenation of the wastewater at the same time. Reduction of viruses of 60 percent was achieved just by air suction without any other gas and chemicals feed. Two runs with air might result in about 80 percent reduction. Microbe growth and variation is reduced with just clean air suction and eliminated with ozone feed. OxTube Machine and Water Treatment Unit can be installed in various positions in present treatment processes and facilities of various water matrices. It can be applied in pre-treatment, removal of the water load, clarification and oxygenation and disinfection of various wastewater matrices. Further, discharge water can be treated with the environment respect.

The four phase clarification and bubble generation of OxTube Machine can be applied in all the areas of water purification and recycling described in Figure 1. Volumes of 0.1 to 6000m<sup>3</sup>/h with one OxTube Installation can be clarified and returned to the natural water cycle with full environment respect. OxTube Machine can be integrated in and combined with present water systems. The DuOx nozzle can be integrated in hydro turbines combined power generation and water treatment. Combined fountain and water treatment by integration of DuOx Nozzle reduces energy consumption

into half or more and the nature loves it according to fountain tests completed. DuOx Nozzle improves fire extinguishing, saves water and reduces damage by feeding an inert gas like nitrogen and carbon dioxide, or smoke from the fire (Figure 4). Irrigation and fertilizing can be combined by means of exact spot farming. The integrated clarification should be started at all the water intakes already due to fact that waters content already too much waste, drug residues, radon and micro plastics. Seas and oceans -refuse dumps of the water cycle -can be refreshed by integrating OxTube Machines in ship structures.

A cruising ship can treat sea water of 240000 cubic meters a day without additional fuel consumption. There are more opportunities to be solved by water treatment in respect of the nature. During the research and test runs in product development the clarified water was found to be a bit slippery and its surface tension reduced. It has a significant impact on skin, hair and nails, and taste and mouth hygiene as well. Further, eczemas and various wounds recovered fast without additional medical care, and signs of metabolism improvement were reported by people involved in test runs. Since 2015 the health and wellness impacts have been verified with over 500 voluntary people and health care professionals. The process and water content are known but the biological reactions are not yet fully studied. Pure air and water have certain health features and mixing and dissolving these deeply together the healthy impacts and transfer speed are multiplied in wet contact [2].

### Acknowledgements

None.

### Conflict of Interest

None.

### References

1. Pylkkanen J (2021) Title of the paper: Integrated Water Clarification, Hydrology-Current Research and Future Directions, IntechOpen.
2. Pylkkanen J (2024) Title of the paper: Combined Water Clarification, ICWRR 2024 & IWA-RMTC2024 Proceedings of Water Resource Recovery from Wastewater Treatment & 7<sup>th</sup> IWA Regional Membrane Technology Conference.
3. Pylkkanen J (2021) Title of the paper: OxTube Integrated Water Clarification for Removal of Pharmaceutical Residues and Disinfection, IWA Ecotechnologies for Wastewater Treatment, Milan 21-25.
4. Laakso V (2014) Title of the paper: Test Results at Oulu University.
5. Ikonen J, Ilpo Nuutinen, Marjo Niittynen, Anna Maria Hokajärvi, Tarja Pitkänen, et al. (2021) Title of the paper: Presence and Reduction of Anthropogenic Substances with UV Light and Oxidizing Disinfectants in Wastewater, A Case Study at Kuopio, Finland. Water 13(3): 360.
6. Pylkkanen J (2016) Title of the paper: VoxSton-New Process Water Treatment System, China Paper Newsletters 7: 49-51.
7. Pylkkanen J (2023) Title of the paper: VoxSton-A New Water Clarification System, Water Purification-Present and Future, IntechOpen.
8. Pylkkanen J (2016) Title of the paper: VoxSton-New Pulp and Paper Process Water Treatment System, China Pulp & Paper 35(12): 66-70.