

Planet Horizons
Technologies
Physical water treatment

TECHNOLOGIE IN DETAIL

Wastewater



*Water Supply
Networks*

Surface Waters



Irrigation

Buildings



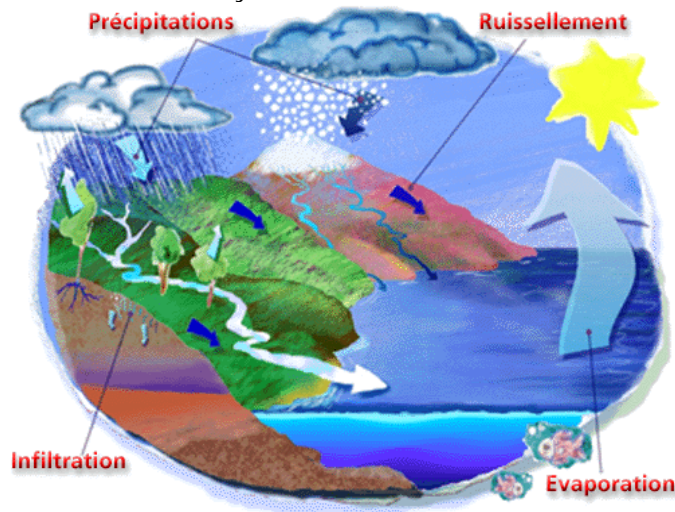
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1. Scientific basics of water

Cycle of water

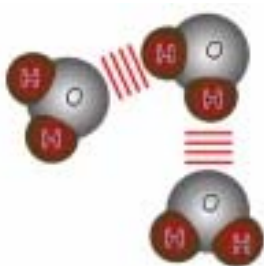
Let's look at the cycle of water: from the surface of the sea, the evaporated water rises into the



stratosphere. At these heights the water is in its finest form, which is in the shape of a ball instead of the drop shape, because the gravitation is negligible. This is the phase we call levitation, the moment the water and the "clusters" are perfectly organized. The water afterwards forms clouds, which release the water back onto the earth as rain or snow. The fresh restructured water is especially receptive to new informations at this stage. It is able to integrate new information into its structure, when it comes into contact with other materials. This is the second part of the cycle, in which the inner earth and the forests are necessary to form large resources of groundwater, which has a high surface tension and a generally high quality. The legendary Austrian forester and researcher Viktor Schauberger called it "the internal elasticity" of the water. When the

water finally reaches the creeks, rivers or underground-streams, it comes into contact with all possible materials (minerals, pollutants, etc.), including living beings.

Structure and physical properties of water



Water, essential component of all living forms is at the base of life on our planet. Although it is the most current of the liquids, it remains an unusual substance whose anomalies of its behaviour still are not entirely elucidated. Water is represented by the formula H₂O; it has the shape of a flat V, with an irregular distribution of the electronic loads. At the point of the V, the place of the oxygen-atom (O), it is slightly negative. The two ends of the V, the place of the hydrogen-atoms (H), are loaded slightly positive. The physicochemical complexity of water which the formula H₂O does not suppose, is based partially on its electric polarity, but also on other properties like the formation of the

special connections called "hydrogen bonds" and the ability of self ionization. The anomalies of water are precisely due to these hydrogen bonds which make life possible our planet. Whereas it should be gas at the ordinary temperatures water is liquid; contrary to almost all the other elements it is less dense in the solid state than in the liquid one (maximum density at +4°C); its specific heat is abnormally high compared to all other liquids, the latter increase normally regularly with the temperatures whereas for water it varies while passing by a minimum at 35°C; its freezing point, its boiling point, its latent heat of vaporization and its permittivity are very high; just like its surface tension which is the highest of all the liquids. All these physical anomalies show that water is far from being only the simple small molecule H₂O.

Complexity also lies in the way in which the water molecules will be linked the each other, and in the dimension and the structure of the "clusters" which form groupings of several thousands of molecules and which play a significant role in the quality of water.

Recent research in homeopathy confirms that water is also able to store, conduct and reproduce information. One can imagine this as follows: the materials leave an impression in the structure of the

molecules, similar to the impression made by pressing something into a mould. This model though is strongly simplified, because the "impression" is an electromagnetic vibrating structure, of rhythmic oscillating nature.

A generally understandable approach to the realization of quantum physics

Our research, based on calculations from quantum physics, have supported, that the electromagnetic structures in nature, and specifically in living organisms and water are constructed harmonically. This means that the resonance frequencies of the single components almost exclusively stand in harmonic relations to each other (i.e. 2:1, 4:3 etc.). If these very fine vibrations would be audible, our ears would sense that they perfectly fit to each other, like a symphony. If we analyze for example the structure of Chlorophyll (a key component in plants), we find this approach exactly confirmed. Hydrophilic and hydrophobic (water attracting and repelling) properties can also be explained with this approach, as well as all the related phenomena like capillarity.



The modern physic also shows that the harmonic relationships can again be found in the subatomic structures. An the other hand we know from since long time recognized theories like the ones from Maxwell, that EVERY electromagnetic field has an influence on his environment. Here the differentiation between natural and technical fields is important.

Nature and human beings permanently radiate electromagnetic waves; these waves were perfectly harmonized during millions of years. It is not realistic to believe that artificial electromagnetic radiations arbitrarily selected do not have an influence on these natural oscillations, even if these vibrations can't be heard nor seen.

Such oscillations can be compared to a musician who starts to play beside an orchestra of perfectly balanced professionals, without according his its instrument, without paying attention to its volume, even without paying attention which piece they are playing. He obviously will ruin the whole structure of the orchestra which will only find a good harmony again after this musician stops or after he is synchronized with his partners.

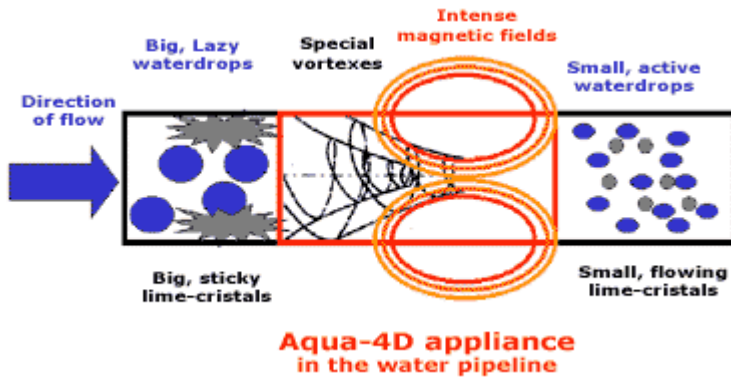
Moreover, recent and very rapid degradation of many lakes without modification of the chemical contributions tend to confirm that this imbalance is generated by growing quantity and intensity of technical electromagnetic waves (high voltage transmission lines, antenna relays and satellites for all communications, etc.) which disturbs and breaks the natural electromagnetic structures of water and organisms. We can also imagine, that the disturbances of the electromagnetic ambience are distributed very subtly by technically produced chemicals, because production processes take place in a electromagnetically polluted environment (not being conscious of the above mentioned facts), and therefore the subatomic structures are decisively disturbed. It is more obvious, that these disturbances also take place in the water pipes, here it can be followed precisely thanks to the changing behaviour of ions, oxidation and crystallization processes, which basically are electromagnetically conducted processes.

HARF principle of electromagnetic activation of water

Our Technology has natural structures as model, and acts as a system, which electromagnetically conditions and corrects an aqueous environment. We call this approach the "harmonic activation of resonant frequencies" (the "HARF-principle").

The Aqua-4D[®] treatment activates the water specifically adjusted to the solution of the problem and the desired properties of the treated water. This is why the DIAGNOSTICS are of central importance. With the Aqua-4D[®] patented modular system, the characteristics can be specifically adjusted. The system

works with a combination of vortexes and electromagnetic fields and frequencies.

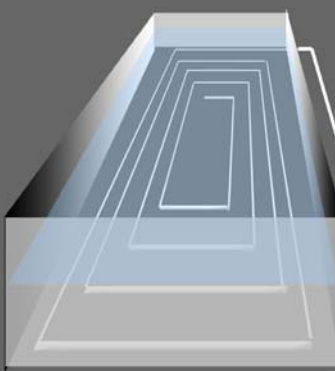


The vortex, at the beginning, conducts the water into defined directions, this way we can perfectly optimise the treatment by the following magnetic fields. Those fields have the task to shake and activate water molecules, which are like small magnets. Thus, the frequencies and harmonies used are stored by the water, and the groups of molecules, (the clusters) are completely re-organized. The physical properties of the water are then changed; however, some of these properties show only tiny measurable differences. The effects on

materials in the water, such as lime, nutrition and chemicals are much clearer. The dissolution capacity of water is also clearly improved.

For the treatment in the lakes and waste water treatment plants, the design with tubes as for the water supply networks resulted in two problems: at first the pipe installations were too large, and secondly the costs of energy for the circulating pumps were considerable. So it was necessary to look for other solutions to emit the electromagnetic signals into the water. The selected approach consists of transmitting the signal to a wire which functions as antenna and which is placed at the bottom of a lake or a water treatment basin, from where it emits the electromagnetic waves favourable to the environment.

LES APPAREILS AQUA-4D



ANTENNES

L'antenne est utilisée pour les plans d'eau ainsi que les bassins des stations d'épuration

Elle est fixée au fond d'un bassin ou d'un lac

Sa longueur varie en fonction du volume à traiter (généralement de 500 à 2000 m)

On utilise généralement deux antennes pour le traitement

COMMANDE

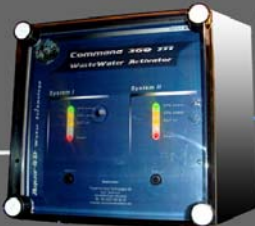
La command 360 III est déclinée en plusieurs modèles, en fonction des applications


Programmable par ordinateur

Selon le modèle, elle permet de brancher 2 antennes ou 4 tubes

Dimensions: (300 X 300 X 170 mm), Poids: 4.8 kg

Dispositions de sécurité: EN50298:1998, EN60950, IP65





TUBES 360

Les tubes sont utilisés pour les réseaux d'eau, l'irrigation et les bâtiments

Débit maximum: 360 l/min. par tube

Longueur: 80 cm, Taraudage: 2 pouces

Pression de service: 10 bar

Distance entre les tubes: minimum 150mm, mesurés d'un centre de l'axe à l'autre

4 tubes max. par électronique (1440 l/min)

Solutions pour de plus gros débits disponibles

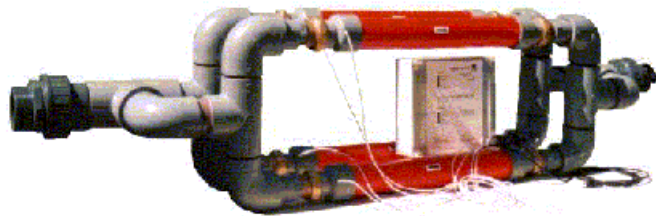
2. Technology for public needs

a. Water supply networks



modular units and can easily be upgraded for larger flow rates. The integration in the water pipe produces a constant effect.

Our technology represents a significant evolution compared to the other physical treatment systems. We have a theoretical approach based on quantum physics to calculate the resonance frequencies of the various elements. Our system can be programmed with a combination of various frequencies in a harmonic ratio (musical theory, mathematical ratios); we can also regulate the intensity and the shape of the emitted signals.



The effect on lime-scaling is the most known. Lime is presented in the crystalline form. The Aqua-4D[®] appliance modifies its structure (calcite form in aragonite form) so that this latter can no longer settle in the water pipes. It follows a prevention of scaling as well as an increase of the installations lifetime. In addition to the preventive action, our physical treatment has a curative action by gradually removing the lime already deposited in the water pipes.

Our system also allows a stabilization of oxides and an internal passivation of the water pipes (see the following pictures). The combined effect on scale and corrosion makes it possible to prevent the development of bacteria, which in these areas find the favourable conditions to their proliferation.

After years of track records and lots of success in the water treatment for homes and buildings, our appliances were developed to work on a higher scale to respond to the expectations of the communities and cities. This method rings in a new era of water treatment, much healthier and more ecological than the traditional ones.

Our technology makes it possible to solve two major problems, which are the corrosion and the lime-scaling of water pipes, in the same time making a better quality of water for the organism.

The appliance is installed permanently into the main water pipe before distribution. It consists of tube flow units and a control unit. The entire system is structured in



Control pipe on the commune of Orsières, Switzerland, at 1 km of the water tank

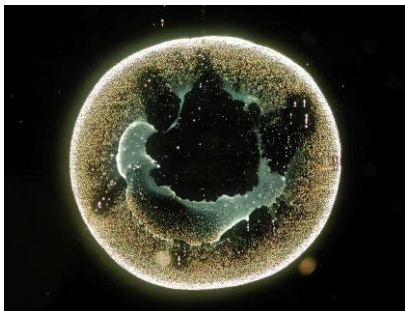
Left: tube after 8 years without treatment

Centre: tube after 6 years with our Aqua-4D® system

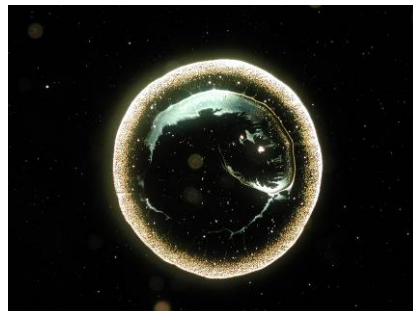
Right: tube after having passed a rag on the fine deposited layer



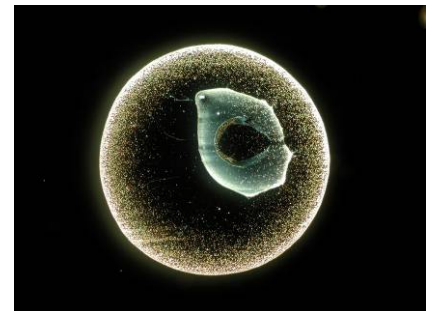
The normal state of water in nature is a state of movement. In fact the vortices created by the water flow lead to its structuring and its various potentials. Suppressing this movement while being compressed in the pipes, the water loses its vital properties and deteriorates very quickly. However, by using pictures taken under microscope (see below) we could show that in addition to the action on lime and corrosion, our electromagnetic treatment allows restructuring water in order to approach its original quality and thus can be much more advantageous for the organism.



Spring water



pipe water before Aqua-4D



pipe water after Aqua-4D

We also remark a significant improvement on the most sensitive element to lime, the storage water heaters. The observations made in the community of Orsières after 6 years of treatment show an important improvement on the level of the private water heaters. The first one observed at 1 ½ km from the water tank and functioning at 60°C presented a very weak scaling with a powdery structure of lime, very easy to clean. The second one functioning at 80°C (conditions of strong scaling) at approximately 1 km of the water tank always presented a scaling but the structure of lime was also modified and allowed an easy cleaning.

In addition it needs to be mentioned that, since the installation was finalized in this community, we have kept on developing our technology, which is now more efficient than it was 6 years ago.

b. Surface waters



With the growing pollution (also an electromagnetic one), year for year the surface waters are in a worse state. Nowadays they are regularly victims of eutrophication. Eutrophication is a special but natural form of pollution of certain watery ecosystems, which occurs when the system receives too many nutritive elements, which consequence is the proliferation of algae. The principal nutrients at the origin of this phenomena are the phosphorus (contained in phosphates) and nitrogen (contained in ammonium, nitrates, and nitrites).

For the treatment in the lakes and the ponds, the design with tubes as for the water supply networks resulted in two problems: at first the

pipe installations were too large, and secondly the costs of energy for the circulating pumps were considerable. So it was necessary to look for other solutions to emit the electromagnetic signals into the water. The selected approach consists of transmitting the signal to a wire which functions as antenna and which is placed at the bottom of the lake, from where it emits the electromagnetic waves favourable to the environment. This wire can have a length of several hundred meters. The main advantage is that the water of the lake is exposed permanently to the electromagnetic vibration of the antenna.

Coming back to the eutrophication, it is observed especially in the ecosystems whose water is renewed slowly. A lake receives indeed large quantities of nutritive materials, brought by the torrents and waters coming from the currents of the precipitations. Stimulated by this substantial contribution, certain algae grow and multiply in an excessive way. This growth takes place in the superficial layers of the water because the plants need light to develop. These algae in excess lead to an increase in the natural load of the biodegradable organic matter ecosystem. In the depths of the lake, where the dead algae come to settle, the aerobic bacteria which nourish themselves proliferate then, consuming more and more oxygen. However in the absence of a sufficient circulation of water, the bottom of the lake is not enough oxygenated and the bacteria achieve to consume the oxygen of the deep water layers. They cannot degrade all the dead organic material any more and this material accumulates in the sediments. Such a situation becomes worse, when the weather is hot, because the solubility of oxygen in water decreases.



This very slow natural process can be strongly accelerated by additional domestic, industrial and agricultural effluents, and lead to the death of the watery ecosystem in a few decades, or even in a few years. Thus there is a short-term problem with the water quality of the lake which runs out of oxygen, the transparency of water decreases and the ecologic system of the lake (fauna and flora) is disturbed and unbalanced. In the long term, a significant accumulation of sediments is also attended, which fills up the lake and finally results in its death.

Therefore we see here the mayor function of oxygen to guarantee a good self-purification of the lake, to ensure the balance of the watery ecosystem. This is why we use an electromagnetic vibration corresponding to the frequency of oxygen for the treatment of the lakes and ponds.

Our first installation carried out in May 2004 in the lake Moubra in Crans-Montana, Switzerland, quickly showed very encouraging results. Whereas the chemical treatments of the previous years did not show remarkable results, the replacement of the latter by our electromagnetic treatment made it possible to obtain a better transparency of water and a less significant development of algae (better visual aspect and reduced maintenance works).

c. Wastewater treatment plants



The purification of wastewater inevitably leads to the production of sludge. Whether water ran through domestic or industrial processes, the quantity of suspended material can vary considerably. The rough materials are collected in the first tanks of the treatment plant where they constitute "primary sludge".

The finer materials, a polluting load in dissolved and colloidal form is treated afterwards. Generally, to eliminate this pollution, biological processes of purification (aerobic ones for the majority) are used, with bacteria which consume the biodegradable polluting material. These bacteria multiply themselves and it is necessary to evacuate this "living" sludge

excess by decantation, what constitutes the "secondary sludge".

These two types of sludge are the inevitable by-products of purification. In spite of important research, their production cannot be significantly reduced industrially. The produced sludge coming from the waste of an inhabitant is estimated between 14 and 20 kg a year depending on the way of purification.

The mixture of primary and secondary sludge constitutes "fresh sludge". This sludge is very liquid (solid part of 1 to 3 %). A thickening allows reducing the quantities of water (solid part of 6 to 8 %). They can then be dehydrated with the help of conditioning products like organic polyelectrolyte. According to the nature of the conditioning products and the type of equipment used, the obtained sludge can be pasty (solid parts of 15 to 30 %) or solid (solid parts of 30 to 50 %). A heating treatment then makes it possible to produce dry sludge (solid parts of to90 % minimum). Incinerated, this sludge is reduced to mineral materials.

With our technology, we are able to bring significant improvements to each one of these stages.

- The biological stage of purification: this stage is generally carried out in aeration basins where aerobic bacteria degrade the polluting load which is present in dissolved and colloidal form. To do this they need oxygen, for the degradation of the organic material and for their breathing. Moreover, these bacteria form what is called flocs. These latter consist in accumulations of bacteria connected to each other in these flocs, only the bacteria in the periphery are really active. Our goal is to work with the electromagnetic frequency of oxygen, among other things, to reduce the energy requirements for the aeration turbines, while increasing the proportion of the active bacteria. This reduces the quantity of produced sludge and is then an important profit for the following stages.

- The stage of decantation: in this stage, chemicals called coagulants and/or flocculants are added with sludge coming from the aeration basins in order to gather a maximum of bacteria in flocs and thus to improve the decantation. In this stage, the effectiveness of the electromagnetic treatment lies in the reduction or the suppression of the coagulants and/or flocculants while improving the decantation (reduction of the residence time of sludge in the basin and/or increase in the compressibility rate, i.e. their content of solid materials).

- The stage of thickening: the excess of sludge coming from the decantation tanks is sent in the thickening tanks where as its name indicates sludge is thickened. In this stage we propose to increase the content of solid materials in the sludge in order to reduce the following costs of dehydration (use of expensive polyelectrolyte and costs in energy) while improving this process by a modification of the structure of sludge.

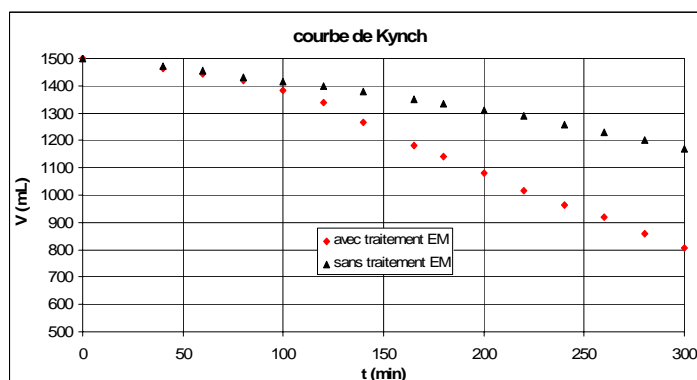
All of these stages make it possible to have a smaller quantity of sludge produced as well as a higher content of solid materials, thus reducing the costs of incineration and transport of dried sludge.

We have made an installation on the level of the aeration basins in the wastewater treatment plant of Mariazell in Austria where a minimum of a third of the flow passes through our Aqua-4D[®] appliance.



The problem is a high consumption of chemicals to eliminate phosphates and a slow biological activation process. The installation was really functional in September 2004 and now we will follow the evolution with the analyses which are made there.

We also collaborate since August 2004 with the wastewater treatment plant of CIMO in Monthey, Switzerland. It is a large plant which treats wastewater of the communities of Monthey and the surrounding ones. But the principal polluting load comes from the chemical industries of the area. From August to December we carried out many laboratory tests which enabled us to produce very encouraging results. Consequently the wastewater treatment plant of CIMO decided to equip one of their decantation tanks with our new technology (example below). The principle is similar to the one treating the lakes, we install wires inside the decantation tank but the electronic design and the choice of the frequencies used are much more complicated.



The test giving the Kynch curve consists of determining the height of the interface (separation area between water and sludge) of a sludge sample put in static decantation in function of time. On the example above, it can be perfectly seen that the decantation is largely improved by the electromagnetic treatment (red curve). The compressibility rate of sludge (i.e. content of solid materials of sludge) can be doubled, or the residence time of sludge can be decrease roughly by 40% to arrive at the same point of sludge compressibility without physical treatment.

The installation was carried out in April 2005 and values are followed in parallel in the treated basin and in another untreated in order to check if the excellent results obtained in laboratory are the same in a basin of 2000 m³.

The laboratory results allowed doubling the effectiveness of decantation while suppressing the addition of coagulants.

3. Technology for irrigation

Our Aqua-4D[®] technology for the improvement of agricultural production has been tested for more than 8 years, it brought great satisfaction to our customers. Evidence of efficiency has been proved by official institutes.

Our technology, innovative in the field of the physical treatment for the agricultural production, improves in particular these following points:

- Improved plant growth;
- Root system stronger and more developed;
- More abundant and earlier harvests;
- Higher effectiveness of fertilizers and fungicides;
- Substantially lower costs for maintaining the irrigation systems, jets and heating elements;
- Less attacks by fungi, rot and pests;
- Rise in the rate of grounds retention;
- Generally, reduction of the water needs.



Harvest of Maurice Dussex, Saillon, Switzerland

As for the communal water supply networks, our Aqua-4D[®] treatment leads to an activation of water by a combination of a vortex and special electromagnetic fields.

Our technology represents an important evolution compared to the other physical treatment systems. We have a theoretical approach based on quantum physics to calculate the resonance frequencies of the various elements. That allows acting in a specific way according to the desired objectives.

Our system can be programmed with a combination of various frequencies in a harmonic ratio (musical theory, mathematical ratios); we can also regulate the intensity and the shape of the emitted signals.

The many tests and applications we carried out until now as well as the results obtained by the official institutes and our customers enabled us to check and correlate our theoretical approach with the practical and empirical results.

The plants have a very strong reaction on the physical treatment of water, if this one is effective. During their growth, they increase in strength and dimension. The rot is also generally of much less importance and the resistance to the diseases improved. Capacity of dissolution is increased; it follows a clear reduction in the addition of chemicals. Reduction in products such as fertilizers, acids and others, allows a reduction in the costs while increasing the yields and the ground quality.

All the results and testimonies obtained until now confirm the effectiveness of our treatment in the irrigation, it would take too much time to gather them here but we can give more detailed information if necessary.

4. Technology for industry

The technology is similar to the one for the communal water supply networks, it allows:

- Reduction of production interruptions;
- Clear reduction of costs;
- Longer lifetime of equipment;
- Higher efficiency of cooling and heating installations, reduction of energy costs;
- Clear reduction of the maintenance costs of technical installations (cleaning agents, chemical ingredients and manpower);
- Reduction of corrosion danger;
- Reduction of chemical additives;
- Optimisation of the production procedure.



5. Technology for homes and buildings



We mentioned that our products bring out astonishing results in the water treatment of buildings. Specialists as plumbers were often sceptical because of experiences with other systems. Initially they wanted to test our technology at home, and then they all were convinced.

Now we have a long experience in this field and all testimonies of our customers agree in confirming the effectiveness of our system. The technology is similar to one for the communal water supply networks in an inevitably reduced dimension and slightly less complicated device.

Advantages are as follows:

Healthy potable water

- Activation of drinking water.
- No chemicals or replacement of calcium ions by sodium ions.

Easier cleaning

- Easy cleaning of glasses, surfaces and shower partitions.
- Reduced quantity of cleaning products due to an improved dissolution capacity of the water.

Installation protection

- Existing lime-scaling is reduced and simply washed away.
- A thin corrosion protection layer is built up in the water pipes.
- No further lime-scale in boilers, shower-heads, water taps and appliances such as coffee machines, pans etc.
- Reduced consumption in dishwashers soap.
- Reduced employment of water softener and minimum detergent dosage in washing machines.

Lower maintenance costs

- Lower costs for hot water production, by eliminating lime deposits in boilers and heating pipes.
- The amount of detergents, shower gels and softeners can be reduced up to 50%.
- No need to use aggressive chemical de-scalers.
- Maintenance without chemicals, therefore no additive costs.
- Low energy costs (approx. 10 Euro per year).

Walter Thut, director,
Dr. Eric Valette, research & development manager,
Crans-Montana, spring 2005

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