



**THE GRANDER<sup>®</sup> TECHNOLOGY**

Water Treatment for the 21<sup>st</sup> Century



GRANDER

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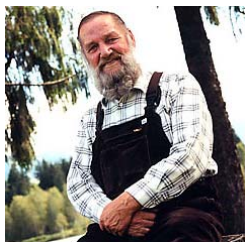
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**The Grander® Technology** is the product of more than two decades of research into molecular resonance and the structure of water by Austrian naturalist and inventor Johann Grander.

The result is a breakthrough water treatment technology that restores a coherent, higher order molecular structure to water. In so doing, water quality is restored at the most fundamental level possible, and issues such as uncontrolled algae and bacteria growth, scale formation and high corrosion rates are naturally resolved.



Inventor Johann Grander



Johann Grander's research into water's energetic and structural properties consumed more than a decade of his life.

The end result, however, was worth waiting for: his technology is gaining worldwide recognition and scientific acclaim.

The result is both remarkable and surprising, but not unprecedented. What the laser beam is to light, the Grander® Technology is to water. A laser is nothing but ordinary photons of light moving in resonance with one another, but when this highly ordered state is achieved light becomes far more than a source of illumination. Likewise, when water's molecular structure is elevated to a higher order condition, the water displays properties which simply cannot be achieved otherwise.

Best of all, the technology is solid state, requires no chemicals or electrical power, and contains no moving parts. Because the technology is simply regenerating water's original molecular condition, which is the true underpinning of genuine water quality, it is essentially universal in its application.





According to Johann Grander, “the energy used in water revitalisation is a natural one, and as we always say, ‘water revitalisation’ transmits vibrations, i.e. information, and not energy itself.

By this transmission of information, the water itself ... [is] given the opportunity to reconstruct [its] self-cleaning power and stamina, and to restore an inner order.”

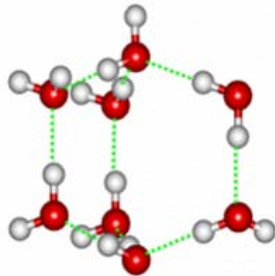
**The molecular resonance** process that lies at the heart of the Grander® Technology involves two stages: an active treatment process that is performed at the manufacturing facility in Austria, and the passive treatment process that is at work in the field.

In the active process, a novel type of generator is used to create resonating magnetic fields that directly modulate the source water’s molecular structure. This proprietary process is far more complex and involved than a simple exposure of water to magnets, and involves passing an ultra-high frequency magnetic current through the water. The result of this treatment is the entrainment and stabilization of the water molecules into a resonant state that is once again in harmony with nature’s processes of information generation and transfer. One might imagine this process as being that of taking a great many individual water molecules, and uniting them into a single system.

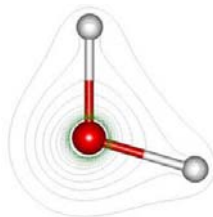
The passive portion of the treatment process occurs in the field wherever a piece of Grander® Technology equipment is installed. The water that has been treated at the manufacturing facility possesses a molecular structure that is once again “plugged-in” to nature’s network of dynamic information. When untreated water comes into contact with the physical fields that accompany this molecular condition, the untreated water likewise becomes entrained into a similar resonance state. This secondary water-to-water molecular resonance is strong enough to enable the treated water to once again develop and sustain a more complex array of natural processes.

**Perhaps the most remarkable** feature of the Grander® Technology is its performance with regards to microbiology. Research around the world has confirmed the existence of a link between the molecular structure of water and the microbiological dynamics that the water system exhibits, and in this regard, the technology stands alone.

Instead of aiming to control microbiology by using an active disinfection technique, the exact opposite approach is taken. The higher-order molecular structure of the water actually stimulates beneficial bacteria growth while simultaneously limiting the success of pathogenic populations, thereby restoring the natural microbiological equilibrium in the water. When this is achieved, the water's natural "immune system" is once again fully functional.



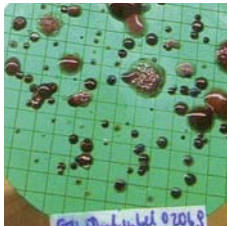
An amazing system characteristic emerges in the water: when organic materials or toxins are present, the bacteria respond very rapidly to break them down and cleanse the water, but once this is achieved their numbers drop to extremely low levels and their presence in the water is essentially harmless.



Thus, the water's natural microbiological equilibrium, the product of eons of evolution and adaptation, is both reactivated and stabilized. The bacteria are present when they are needed, and absent when they are not. This type of "intelligence", or higher order behavior, simply cannot be sustained in the system when water's coherent structure has been disturbed.

**The microbiological change** that takes place in Grander® revitalized water is one of the primary indicators used to prove the efficacy of treatment. In response to the improved structural characteristics of the water, the bacteria populations actually undergo a genetic transformation.

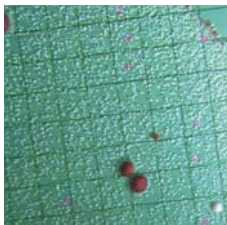
Specifically, the development of “pin point” bacteria is an indicator that beneficial microbiological conditions have been restored to the water. Their presence is a sign that a great many other beneficial strains of bacteria have been reactivated and stabilized within the water, and are ready to participate in the break-down of organic materials or toxins that may find their way into the water.



**A Non-Revitalized Water Sample**

The bacteria colonies shown here, commonly referred to as “wild colonies”, are typical of non-revitalized water samples.

The bacteria colonies vary greatly in size and shape, and reflect a condition in which the overall bacteria populations are too “sluggish” to act as an effective cleansing mechanism in the water.

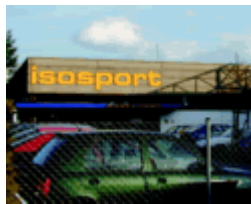


**A Grander® Revitalized Sample**

After revitalization, the higher order structure within the water has a profound effect upon the nature and behavior of the microbiological organisms within the water. The colonies shown here, referred to as “pin point” colonies, are relatively uniform and evenly dispersed throughout the sample.

Their presence is an indicator of high water quality.





At the ISOSPORT manufacturing plant in Austria, microbiological fouling and corrosion products were a difficult problem to overcome in maintaining system stability and repeatability. As a world-leading manufacturer of custom composite plastic materials for the ski and snowboard industries, this repeatability is crucial to the quality of their products.

Installation of the Grander Technology has allowed them to minimize corrosion rates, eliminate microbiological problems and achieve their highest degree of system stability to date - without the use of chemicals.

**In order** to remain a liquid at room temperature, individual water molecules must be held together in large clusters by hydrogen bonding. When water lacks a coherent molecular structure, however, the number of molecules per cluster is higher than when the coherent structure is in place. The result is a decrease in available sites for hydration of minerals, organic materials and toxins.

After treatment with Grander® Technology, the molecular clusters naturally break down into smaller clusters, and this enables the water to dissolve and transport more minerals in solution. Also, this activates nucleation sites for the precipitation of minerals in solution. Instead of depositing on pipe walls or heat exchange surfaces when the mineral saturation point is reached, the minerals actually bond with one another in solution to form a soluble crystal that will settle where system velocity is low. This settling typically occurs in the system basin, collection tank, receiver, reservoir, etc.

Experience has shown that corrosion rates are also minimized due to the higher order structure of the water. In cooling tower systems, corrosion is naturally limited by operating the system without biocides or chemical stabilizers and inhibitors, which allows the water to reach a slightly alkaline equilibrium condition in which the corrosive tendency is very low. Additionally, microbiologically induced corrosion (MIC) is eliminated due to the positive effects of treatment upon microbiology.



**Research** into the Grander® Technology has not been restricted to the laboratory bench. Numerous field studies and successful projects that have been developed around the world in industrial settings bear witness to the effectiveness of this unique approach.



**AT&S**

AT&S, a world-leading manufacturer of printed circuit boards, uses the Grander® Technology as its exclusive cooling water treatment program at its Austrian manufacturing facility. The switch to this approach has reduced operating expenses and improved the cooling water quality.



**Messer Austria**

Messer Austria produces specialty gases for various industries including welding and surgical anesthetics. Microbiological clogging of process piping cost the company money every year, and efforts were ongoing to find a genuine solution. The Grander® Technology installation paid for itself in under a year in avoided maintenance costs and the elimination of chemical treatment.



**Kugelmann**

Installation of the Grander® Technology at the Kugelmann manufacturing plant in Germany has saved the company energy, water and chemicals. Water used to cool grease-laden equipment no longer develops bacteria, and the time required between system purging has doubled.



**A detailed study** has also been completed on the cooling water system of an ice rink facility in Exeter, NH, and the results have been outstanding.

Scale from the evaporative condenser has been removed and the system microbiology has stabilized. After a transition period, the total plate count remained under 2,500 CFU per mL for the entire six-month test period.



**Prior to Treatment**

At the start of the test, the cooling water was in extremely poor condition, as shown:

pH	8.76
Conductivity	11,970 $\mu$ hmos/cm
TDS	7,338 mg/L
Hardness	1,400 mg/L



**Six Weeks Later**

After just six weeks, while operating with zero bleed due to a clogged drain connection, the following improvements were made:

pH	8.65
Conductivity	1,904 $\mu$ hmos/cm
TDS	1,182 mg/L
Hardness	390 mg/L



**Twelve Weeks**

Twelve weeks after the start of the test, the tower basin was drained and cleaned. This was done so that future system performance could be observed with the system bleed restored.

The bottom of the basin was full of debris: scale which had fallen off of the evaporative condenser tubes. After eight months of continuous operation, the tubes have remained scale-free.

**By the end of the test**, the documented improvements in the water system were dramatic. Without any chemical addition, electrical power or consumable materials, the system has remained clean, with low bacteria counts and zero scale formation.



The final parameters were as follows:

<b>pH</b>	<b>8.21</b>
<b>Conductivity</b>	<b>636 <math>\mu</math>hmos/cm</b>
<b>TDS</b>	<b>484 mg/L</b>
<b>Hardness</b>	<b>180 mg/L</b>
<b>Total Plate Count</b>	<b>310 CFU/mL</b>

In terms of economic performance, the system paid for itself in just 16 months, purely on the basis of offset chemical treatment costs. When other cost reductions such as improved chiller performance due to scale removal in the cooling tower, and reduced water-side maintenance costs in the system are considered, the payback period was even shorter.

**Johann Grander's** groundbreaking research and technology development have earned him two international awards to date: the Silver Medal of Honor from the Russian Academy of Natural Science, and the Austrian Honor Award for Science and the Arts from the Austrian Federal Ministry for Education, Science and Culture.

Although the initial reaction to the claims of this technology is inevitably a healthy degree of skepticism, those claims have been repeatedly validated and proven in both laboratory research and field applications around the world.

The technology has been rigorously evaluated and assessed by:

- The Russian Academy of Natural Science
- German State-Certified Chemist Dr. Horst Felsch
- Dr. Manfred Bruck, On Behalf of the Austrian Association for Consumer Information
- The Institute for Human Ecology and Environmental Medicine in Moscow



Dr. Rachmaninoff is Vice President of the Russian Academy of Natural Science, the Director of the Institute for Human Ecology and Environmental Medicine in Moscow, and an advisor on water related issues to the World Health Organization.

Further research is being carried out at present in other European universities and research institutions, and the results will be forthcoming.

According to Dr. Rachmaninoff, "With [Johann Grander's] method, it becomes possible to strengthen the energy and information properties of water and make it biologically more valuable. His discoveries reveal new knowledge on water structure, promote scientific developments and are of worldwide importance for science."



**Immersion Unit**  
Revitalizers are used in tanks, receivers, basins, ponds, lagoons and the like. Because they can treat large bodies of water with a small unit, they make treatment extremely cost-effective.



**The Flow-Through Water Revitalizers** are used on closed loop systems and on open system make-up lines.

The units can be ordered as large as 4", and where required, they may be combined in parallel.

**The Grander® Technology units** are precision fabricated, laser-cut, welded steel construction with stainless steel wetted parts. The equipment is designed to last within the rigors of an industrial environment.

Within every piece of equipment there are sealed fluid chambers. These chambers contain water that has been treated at the manufacturing facility in Jochberg, Austria by Johann Grander's molecular resonance process to achieve a very high quality coherent molecular structure.

This fluid is the "working fluid" of the equipment, and it functions by maintaining a constant state of resonance with the naturally occurring "higher order" information patterns that are required to maintain a coherent molecular structure in water. In essence, it acts as a sending and receiving station between the water to be treated, and the resonance patterns that exist in Nature.

Testing on the units themselves shows that they have remained effective since the day they were made. This is actually to be expected since there are no moving parts to wear or catalysts to be consumed. A life span of fifteen years is to be expected, and potentially even longer, but that claim cannot yet be made because the technology itself has not existed on the marketplace long enough to make that assessment.