IIREC · Dr. Medinger

Biophysical Product Certification

Investigation of MAUNAWAI filter technology

Part 3:
Summary of test results
Overview of results and evaluation

1. Subject and task

The MAUNAWAI filter system is based on “Pi technology”, and is designed to clean and improve the quality of water, primarily for drinking purposes.

This filter system is sold in Germany and several other countries by the company Green d’Or. The stated aim of the manufacturer is to achieve a water quality as close as possible to that of cell water. There are a number of significant findings by various institutes regarding the filter system. The IIREC has now been commissioned to produce a clear summary and comprehensive evaluation of all existing results in an understandable and reputable format.

1.1 The MAUNAWAI system

The MAUNAWAI water treatment system essentially comprises:

- Pre-filters (ceramic filter, optional limescale filter cartridge) and the actual filter layers:
- Activated carbon/silver activated carbon/coconut layer
- PI and tourmaline ceramic
- Quartz sand and magnetic particles
- Black Magic and alkaline ceramic
- Antibacterial, calcium and EM ceramic

According to the manufacturer, "Black Magic" ceramic is a central component of the Pi system and causes the water to become "iron ionic". (The balance between bivalent and trivalent iron is very important for cells, and therefore also for the similarity of MAUNAWAI water to cell water).

An interesting report on MAUNAWAI water, including a description of the effects of the individual filter layers, was provided by biophysicist Dr Stefan Lanka in the magazine "wissenschafft-plus" (published by klein-klein-verlag, Langenargen).

This report will now address the question of what can be extrapolated from the existing findings (measurements and analysis) regarding the effectiveness of the MAUNAWAI system.

1.2 Data sources

The following reports are taken into account in this document:

(1) Gewerbliches Institut für Umweltanalytik GmbH (GIU), Teningen, Dipl.-Chem. H. Albrich: Examination of the retention of harmful substances in water on the basis of accumulation experiments

This 2005 study concerns a precursor to the current system, which also included a Pi filter system. The study examined the filter's effect on accumulated water samples with pollutant components ("spikes"), namely: nitrate, heavy metals (lead, copper, iron, zinc), potassium hydrogen phthalate (KHP) as dissolved organic carbon (DOC) and polycyclic aromatic hydrocarbons (PAHs).

(2) Labor für Umweltanalytik GmbH (UmLab), Kassel, Dipl.-Ing. Reinhard Prison: Water testing project for the MAUNAWAI water filter

This study included additional heavy metals (lead, silver, mercury), trihalomethanes, a full spectrum of 23 pesticides, the total organic carbon content (TOC) and the chlorine content in free form, combined form and in total.

(3) Institute of Statics and Dynamics of Aerospace Structures, University of Stuttgart, Prof. Kröplin (lead researcher Berthold Heusel MA): Microscopic wa-

ter testing (tap water/spring water/filtered water/water filtered using the MAUNAWAI Water System)

This series of tests investigated the comparative quality of MAUNAWAI filtered water and other water samples using the imaging method developed by artist Ruth Kübler (evaporation images under a dark field or phase contrast microscope). Water filtered and vitalised by MAUNAWAI was compared with water samples from other treatment methods (water from Lake Constance, household tap water and after using a household filter). The study also demonstrated how the water from various cities (Budapest, Pécs in southern Hungary, Stuttgart) was improved by the MAUNAWAI filtration process.

(4) IIREC, Krems an der Donau (Lower Austria), Mag. Dr. Walter Hannes Medinger (2011): Biophysical product certification – investigation of MAUNAWAI filter technology

Part 1: Phase coherence resonance spectroscopy (report 91/2011)

Using a magnetic measurement-based spectroscopic process developed by the IIREC, resonance frequencies in MAUNAWAI filtered water were determined in comparison with tap water. Extraordinarily strong signals were seen after MAUNAWAI filtration, which are particularly indicative of the water's excellent cell mobility.
Supplementary to this, a short report about the protection of MAUNAWAI activated water against detrimental electromagnetic effects was also created (15.11.2011).

Part 2: Physico-chemical analysis (report 104/2011)

In addition to the existing analyses, the basic physico-chemcial parameters of MAUNAWAI water (pH value, redox potential, conductivity) were measured and the capacity for removing selected electrolytes - particularly the hardening elements calcium and magnesium, the nitrogenous ions ammonium, nitrate and nitrite, and the heavy metal manganese - was determined through chemical analysis.

2. Determination of physical and chemical parameters

A modern drinking water supply without regular monitoring of physical, chemical and bacterial parameters is inconceivable. These tests prevent water from carrying levels of pollutants or germs that are hazardous to health, but also prevent the concentrations of impurities that affect taste from reaching an unsatisfactory level. However, there is one thing that this well-founded analysis cannot reveal: how "good" water actually is in a biological sense. The absence of pollutants or bacteria does not mean that water tastes good, or that it has other biologically desirable or even necessary qualities. The benchmark for this quality is natural water, e.g. fresh spring water, or the highly structured water in our bodies, in each of our cells.

Various complementary methods of water testing have been developed to assess these "soft" but biologically highly important properties. Two such methods will be described here in more detail:

first, following the maxim that "a picture paints a thousand words", an **imaging process (evaporation images of water droplets)**, allowing the water quality to be instantly identified by viewing a picture.

Secondly, a **physical measurement process** that records resonance signals at particular frequencies (known as a **spectroscopic process**) can provide detailed information about the biologically active resonances present in the water.

The latter method can also be used to establish the degree to which water quality is negatively affected by "electrosmog", and how water can be protected against these effects. Conclusive studies are available in all of these areas for water treated (filtered and activated) using the MAUNAWAI system.

In the sections below, we will first address the physico-chemical analysis results. We will then turn to the findings regarding the quality of MAUNAWAI water, obtained by complementary methods.
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2.1 Parameters tested and their significance

There is a wealth of test results for the MAUNAWAI system covering the physico-chemical **monitoring and indicative parameters set out by German and Austrian drinking water regulations**, and going considerably beyond these regulations in the case of some substance groups.

The significance of the components listed in the results tables on pages 7 and 8 is briefly explained below.

First are a few **basic parameters** that can be perceived with the physical senses (colour, smell, taste, opacity). These are followed by the fundamental **physico-chemical parameters:** Electrical conductivity is a measurement of how many electrically charged particles (ions) are dissolved in the water. These come from acids, alkalis or salts. The pH value indicates the water's degree of acidity (<7 acidic, >7 alkaline). Similarly, the redox potential indicates whether the water tends towards reducing or oxidising properties. However, this can only be evaluated in relation to other water with the same chemical composition.

Under the heading "electrolytes and halogens" comes the large group of inorganic components. The first listed here are the **cations** (particles with a positive electrical charge) generally measured in water: the hardening elements calcium and magnesium, and also ammonium, which is characteristic of reduced nitrogen compounds (e.g. with the addition of non decomposed, i.e. non oxidised

liquid manure). Next are **anions** (particles with negative electrical charge): these include the ever-present chloride and the oxidised nitrogen compounds nitrate and nitrite, which are measured with regard to agricultural contamination (through over-fertilisation) of drinking water.

Due to the chlorination of drinking water, the **chlorine content** is also of interest. The total chlorine content in water is made up of free chlorine and chlorine that is chemically combined with other substances.

Heavy metals, when dissolved in water, are present as cations. They have a high degree of biological significance due to their toxicity (lead, mercury) or detrimental impact on taste (iron, manganese), or due to their bactericidal effects (silver) or value as essential trace elements (iron, copper, zinc etc.), and are therefore grouped separately in the table. Most **radioactive elements** are also heavy metals. The strong capacity of the MAUNAWAI system for removing heavy metals suggests that radioactivity would also be effectively prevented. It is important to remember that, aside from a negligible amount of super-heavy water, water as a substance (H_2O) is not itself radioactive, but becomes radioactive only through dissolved foreign matter.

Next we turn to the second page of the table, where the organic components are listed. The first are **organic carbons** as a total parameter (total value = TOC and content dissolved in water = DOC). Organic compounds (nowadays this term refers to all compounds with a basic structure of carbon and hydrogen) are found in water as the remains of dead organisms, humus matter etc., but also in the form of a great many undesirable substances of technical origin (fats and oils, flavourings and fragrances, solvents, pesticides, combustion residue, etc.). The summary TOC and DOC values listed are important as it is impossible to individually measure all of these components.

Additional individual measurements are required for organic compounds that are particularly significant to the environment and human health. A large number of these are available for the MAUNAWAI system, starting with **polycyclic aromatic hydrocarbons** (known as PAHs). These are components of soot, tar, petroleum, coal and products of incomplete combustion, and are considered carcinogenic. Of the 16 PAHs listed by the US Environmental Protection Agency, 13 individual components and the total were measured to determine the effectiveness of MAUNAWAI filtration.

Trihalomethanes (THMs) are produced during water treatment with chlorine and are the most significant examples of halogenated hydrocarbons in drinking water. The 4 THMs of particular importance to health were tested individually and in total.

The use of **pesticides** of all types is now widespread in agriculture and forestry, but also in industries such as timber construction and shipbuilding. These are also predominantly organic compounds. The MAUNAWAI system was tested for its effectiveness in removing 23 major pesticides.

2.2 Results

Test results for the individual components discussed in 2.1:

Notes on the table columns:

Column 1: Parameter
The components tested and their significance were discussed in section 2.1. Common abbreviations are used for some parameters, e.g. MCPA = methyl chlorophenoxy acetic acid.

Column 2: Unit
The units in which measured data, limits etc. are given in columns 3 to 6 are listed here with the usual abbreviations. Column 7 indicates the effectiveness of MAUNAWAI filtration independently of the measured values and units.

Column 3: Initial value
This column indicates the initial concentrations in the test solutions used (or in the case of physico-chemical parameters, the values from tap water used for comparison purposes) as stated in the available reports.

Column 4: LOD = Limit of detection
This value is specific to the measurement method used in each case. It indicates the lowest concentration that can still be detected. Below this value, the concentration is so low that firm conclusions regarding the concentration are no longer possible.

Column 5: Limit or benchmark
This column contains the limits set by drinking water regulations or benchmarks set by specialist bodies. It is possible to see whether the limit or benchmark has been met by comparing it with the measured data shown in the next column (column 6).

Column 6: Result
This column contains the value detected in the water after passing through the MAUNAWAI system. In the cases of multiple measurements, the range of results ("from...to") is listed. A "less than" symbol before the data means that the result was below the limit of detection. This means that, after MAUNAWAI filtration, the concentration of the respective component was so low that it could not be measured. For trihalomethanes (THMs), individual components were not measurable (n.m.) in filtered water; there is no data above the limit of detection. However, all of this data is available for the total THMs.

Column 7: Reduction in %
To allow the filtration effectiveness of the MAUNAWAI system to be assessed independently of measured data and units, removal rates in % are additionally listed in column 7 where possible. Reliable data cannot be provided if exact values for the initial concentration and the result (final concentration) are not known. This may be the case, for instance, if the result is so low that it falls below the limit of detection ("<" data in column 6).

Column 8: Testing laboratory
The institutes from which the studies originate were introduced in section 1.2.

Parameter	Unit	Initial value	LOD	Limit or benchmark	Result	Reduction in %	Testing laboratory
Basic parameters							
Sense test							
Colour					colourless		IIREC
Smell					odourless		IIREC
Taste					pleasant (1)	IIREC	
Opacity					clear		IIREC
Physico-chemical parameters							
Elec. conduct.	µS/cm		0.5	2500 (20°C)	504		GIU
		420			500		IIREC
pH value				6.5 to 9.5	7.78 to 8.11		GIU
		7.5			8.23		IIREC
Redox potential	mV	227			252		IIREC
Electrolytes and halogens (inorganic components)							
Cations							
Calcium	mg/l	58	5		16	72.4	IIREC
Magnesium	mg/l	16	5		6	62.5	IIREC
Ammonium	mg/l	5	0.2	0.5	1	80.0	IIREC
Anions							
Chloride	mg/l	125	25	250	100	20.0	IIREC
Nitrate	mg/l	100	3	50	29	71.0	IIREC
Nitrite	mg/l	5	0.5	0.5	2.9	42.0	IIREC
Chlorine							
Combined	mg/l	<0.1	0.1		<0.1		UmLab
Free	mg/l	0.69	0.1	0.3	<0.1		UmLab
Total	mg/l	0.75	0.1	0.3	<0.1		UmLab
Heavy metals							
Lead	µg/l		5	10	<5		GIU
	µg/l	96	5		<5		UmLab
Silver	µg/l	10	5		<5		UmLab
Mercury	µg/l	1	0.1	1	<0.1		UmLab
Copper	µg/l		1	2000	166		GIU
Iron	µg/l		5	200	<5		GIU
Zinc	µg/l		10	500	54.1		GIU
Manganese	µg/l	1000	30	50	<30		IIREC

(1) The taste of MAUNAWAI filtered water was consistently described as very pleasant by testers. It is particularly striking that MAUNAWAI water has a pleasant tea-like taste even when warm and left to stand.

Parameter	Unit	Initial value	LOD	Limit or benchmark	Result	Reduction in %	Testing laboratory
Organic components							
Organic carbon						Total	
(TOC)	mg/l	10.1			1.2	88.1	UmLab
Dissolved (DOC)	mg/l		0.2	2	0.25 – 0.276		
Polycyclic aromatic hydrocarbons (PAH-16)							
Naphthalene	(all µg/l)	0.005	0.02	<0.005			GIU
Acenaphthylene			0.005	0.02	<0.005		GIU
Acenaphthene			0.005	0.02	<0.005		GIU
Fluorene			0.005	0.02	<0.005		GIU
Phenanthrene			0.005	0.02	<0.005		GIU
Pyrene			0.005	0.02	<0.005		GIU
Benzo(a)anthracene			0.005	0.02	<0.005		GIU
Chrysene			0.005	0.02	<0.005		GIU
Benzo(b)fluoranthene			0.005	0.02	<0.005		GIU
Benzo(a)pyrene			0.005	0.02	<0.005		GIU
Dibenz(a,h)anthracene			0.005	0.02	<0.005		GIU
Benzo(g,h,i)perylene			0.005	0.02	<0.005		GIU
Indeno(1,2,3cd)pyrene			0.005	0.02	<0.005		GIU
Total PAHs according to EPA					0.3	0.005	GIU
Trihalomethanes (THM)							
Trichloromethane		84.2			n.m.	UmLab	
Bromodichloromethane		2.8			n.m.		UmLab
Dibromochloromethane		1.2			n.m.		UmLab
Tribromomethane		3.6			n.m.	UmLab	
Total		91.8		50	0.7	99.2	UmLab
Pesticides							
Lindane		10	0.1	0.1	<0.1		UmLab
Atrazine		10	0.05	0.1	<0.05		UmLab
Desethylatrazine		10	0.05	0.1	<0.05		UmLab
Simazine		10	0.05	0.1	<0.05		UmLab
Isoproturon		10	0.05	0.1	<0.05		UmLab
Bentazone		10	0.05	0.1	<0.05		UmLab
Bromacil		10	0.05	0.1	<0.05		UmLab
Hexazinone		10	0.05	0.1	<0.05		UmLab
Mecoprop		10	0.05	0.1	<0.05		UmLab
Propazine		10	0.05	0.1	<0.05		UmLab
Sebutylacin		10	0.05	0.1	<0.05		UmLab
Chlortoluron		10	0.05	0.1	<0.05		UmLab
Dichlorprop		10	0.05	0.1	<0.05		UmLab
Diuron		10	0.05	0.1	<0.05		UmLab
Terbuthylazine		10	0.05	0.1	<0.05		UmLab
Carbofuran		10	0.05	0.1	<0.05		UmLab
Metobromuron		10	0.05	0.1	<0.05		UmLab
Deisopropylatrazine		10	0.05	0.1	<0.05		UmLab
Metazachlor		10	0.05	0.1	<0.05		UmLab
Monuron		10	0.05	0.1	<0.05		UmLab
MCPA		10	0.05	0.1	<0.05		UmLab
Methabenzthiazuron		10	0.05	0.1	<0.05		UmLab
Parathion ethyl		10	0.05	0.1	<0.05		UmLab

2.3 Evaluation

What do the compiled test results mean?

In general, it can be said that the

▸ MAUNAWAI system is very suitable for meeting any requirements regarding drinking water parameters detectable by sense or using physico-chemical analysis.

MAUNAWAI filtered water features all the neutral properties that are desired with regard to colour, opacity, smell and taste. Particularly noteworthy is the fact that the **taste was consistently evaluated as pleasant by the testers – even when the water was warm or left to stand**. Almost no other water treatment process achieves this.

Electrical conductivity increases slightly in comparison with the drinking water used. This can be explained by ion exchange processes. The components removed by the MAUNAWAI system are replaced by highly mobile and therefore more conductive hydrogen and hydroxyl ions. The resulting value is only a fifth of the limit.

The **pH value became slightly more alkaline** compared to the tap water used. Results of around pH 8 were obtained separately by two testing institutes. This is a desirable **counter measure against over-acidification of the body**, which causes us a great deal of trouble.

The **redox potential** was slightly increased compared to the drinking water used for filtering. This indicates successful removal of reducing (principally organic) components.

The removal of **cations** shows that the MAUNAWAI system has excellent capacities for ion exchange. The removal rates of 60 to 70% for calcium and magnesium, which are essential cations, provide a desirable contribution towards **reducing water hardness**. A greater reduction in these elements would not be desirable from a physiological perspective.

For **heavy metals**, which are also present in water in the form of cations, the removal rates achieved are so high that concentrations after MAUNAWAI filtration were **below the limits of detection** (particularly for poisonous or harmful heavy metals), and for the physiological elements copper and zinc were a tenth of the limit. **Chlorine** present in the water is reduced to **below the limit of detection** by the MAUNAWAI system.

A remarkable **removal rate of 70%** is achieved for **nitrate**. Even when the concentration of nitrate and nitrite approaches the limit due to drinking water pollution caused by fertilisation, MAUNAWAI is able to reliably remove these.

MAUNAWAI also achieves extremely satisfactory results with the very comprehensively tested **organic components**. The TOC total parameter indicates a removal rate of approx. 90%.

This figure was significantly exceeded for ecologically or toxicologically significant components. A **99.2% reduction** was achieved for **trihalomethanes**.

All individual components tested in the polycyclic aromatic carbons and pesticides groups were below the limit of detection. Overall, the analysis provides excellent evidence of the MAUNAWAI system's capacity for removing inorganic and organic pollutants of various types.

3. Evaporation images

3.1 Significance of imaging processes

Alongside measurement and weighing, pictorial recording processes are indispensable to science. Photographs generally serve documentary purposes in scientific fields, and special imaging techniques such as x-rays, magnetic resonance spectroscopy or positron emission tomography are a standard part of medical diagnosis. The situation is similar for materials testing. Only in water testing and blood testing (dark field microscopy) are such imaging processes still unrecognised by conventional science.

However, this does not prevent renowned scientists such as Prof. Dr. Kröplin at the University of Stuttgart from using such processes (namely the evaporation image technique developed by Ruth Kübler) to investigate physical and biophysical influences on water. With his crystallisation images and the book "Messages from Water", Dr Masaru Emoto from Japan made many people aware that water has amazing properties about which conventional scientific parameters cannot draw any conclusions. Emoto developed his imaging process after obtaining no response to his strictly scientific magnetic field resonance research on water.

This example clearly shows the advantage of imaging processes, as aptly summarised by the Chinese proverb: "a picture paints a thousand words". Next we will compare a few evaporation images created by Berthold Heusel at Prof. Kröplin's institute.

3.2 Test results

Image series 1 and 2 show the results of two series of tests. In the first series, MAUNAWAI filtered and activated water is contrasted with water samples that were treated in other ways. The second series then contains photographs of tap water from various cities before and after filtering using the MAUNAWAI system.

Image series 1a

Image 1:
Tap water from a household pipe in Vaihingen, Stuttgart

Image 2:
After passing through the MAUNAWAI filter system – the structure is uniform, the crystal forms organic and harmonious, the image differentiated in colour and orderly.

Image series 1b

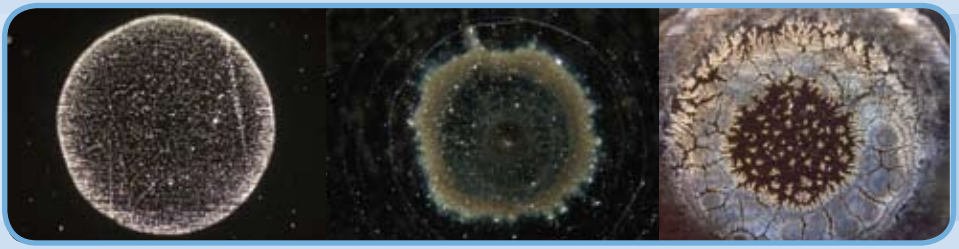


Image 1:
water treated by reverse osmosis

Image 2:
distilled water

Image 3:
Zamzam Well in Mecca

Image series 2a: water from Budapest

Image 1:
water from Budapest (Hungary)
before filtering

Image 2:
various water droplets after
filtering with the MAUNAWAI
water system

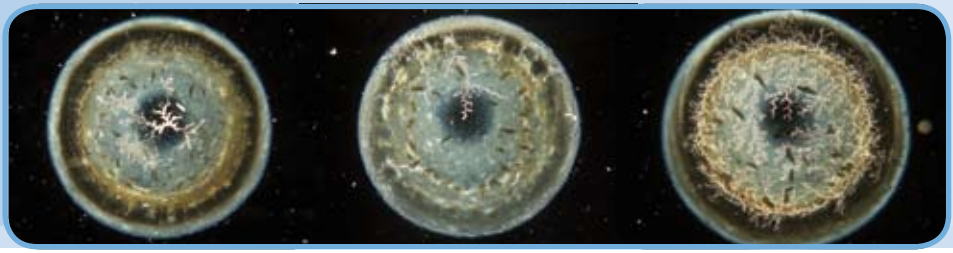


Image series 2b: water from Pécs

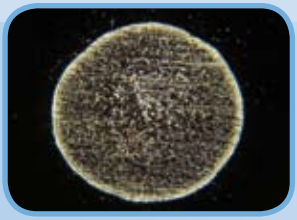


Image 1:
water from Pécs
before filtering

Image 2:
various water droplets after
filtering with the MAUNAWAI
water system

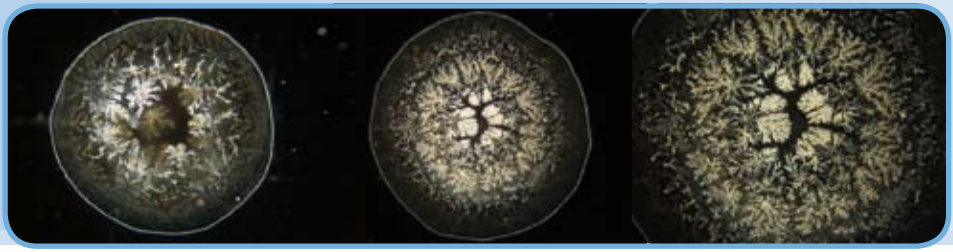


Image series 2c: water from Stuttgart

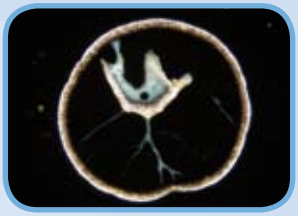
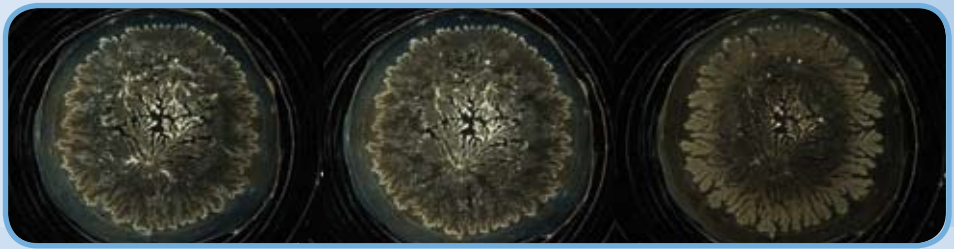


Image 1:
water from Stuttgart
before filtering

Image 2:
various water droplets after
filtering with the MAUNAWAI
water system



3.3 Evaluation

To be able to evaluate evaporation images of this type, a few rules of thumb must first be embraced. The image left on a slide by water droplets as they evaporate is comparable to a sort of stamp impression that provides information about a wide variety of subtle influences on water structure. Filters, water movements, magnetic fields, influences from the biological environment etc. Every drop image is unique, but with repetition under the same conditions, a particular basic pattern nonetheless emerges. This allows conclusions to be drawn regarding the purity of the water or regarding dissolved salt content, the originality and the vitality of the water.

Mineral-rich water, particularly "hard" water, display a very dense structure in the image. Thick white edges indicate a concentration of salts. The structure of the water itself is weak in this case (e.g. in samples of tap water after household filtration or without further treatment).

Less densely detailed or evenly spread structures at the same proportion of mineral (salt) components indicate that the water itself has a stronger structuring power here. This observation is usually accompanied by several regularly arranged ring formations.

The evaporation images of MAUNAWAI filtered water show both these concentric ring formations and also crystal-like structures that are reminiscent of ice crystals. According to B. Heusel, the structure is "uniform, the crystal forms

organic and harmonious, the image differentiated in colour and orderly". It can be concluded from these images that MAUNAWAI water has a high degree of order. According to the latest knowledge, this high degree of order (coherence) is the key to the vitality and vitalising effect of water.

More about this is revealed by the following test results.

4. Investigation of water resonances

4.1 Explanation of the method

It is only in the last 20 to 30 years that water research has shed light on what determines the **biological quality of water**, which we can determine by our sense of taste but not by traditional analytical methods. This quality is essentially related to the ability of water to store information. "**Water memory**" has long been scientific fact rather than speculation. Liquid crystalline (i.e. with a **crystal-like arrangement**) **combinations of water molecules**, which make up around 30% of liquid water at room temperature, form the basis for this. These shapes are very durable, and not only have particular geometrical structures, but also store electromagnetic signals.

These signals are stored **magnetically**, and can be **read** using a process developed by the IIREC for measurement with a magnetic field antenna. When a water sample is exposed to a magnetic signal stored in it, it begins to resonate, allowing a resonance signal to be measured as electrical voltage. When these signals are applied to the relevant frequency (between 0 and 100 Hertz), a spectrum is produced. A **spectrum** of this sort can provide a great deal of information about how "good" a water sample actually is in a biological sense. The benchmark for this quality is natural water, e.g. fresh spring water, or the highly structured water in our bodies, in each of our cells.

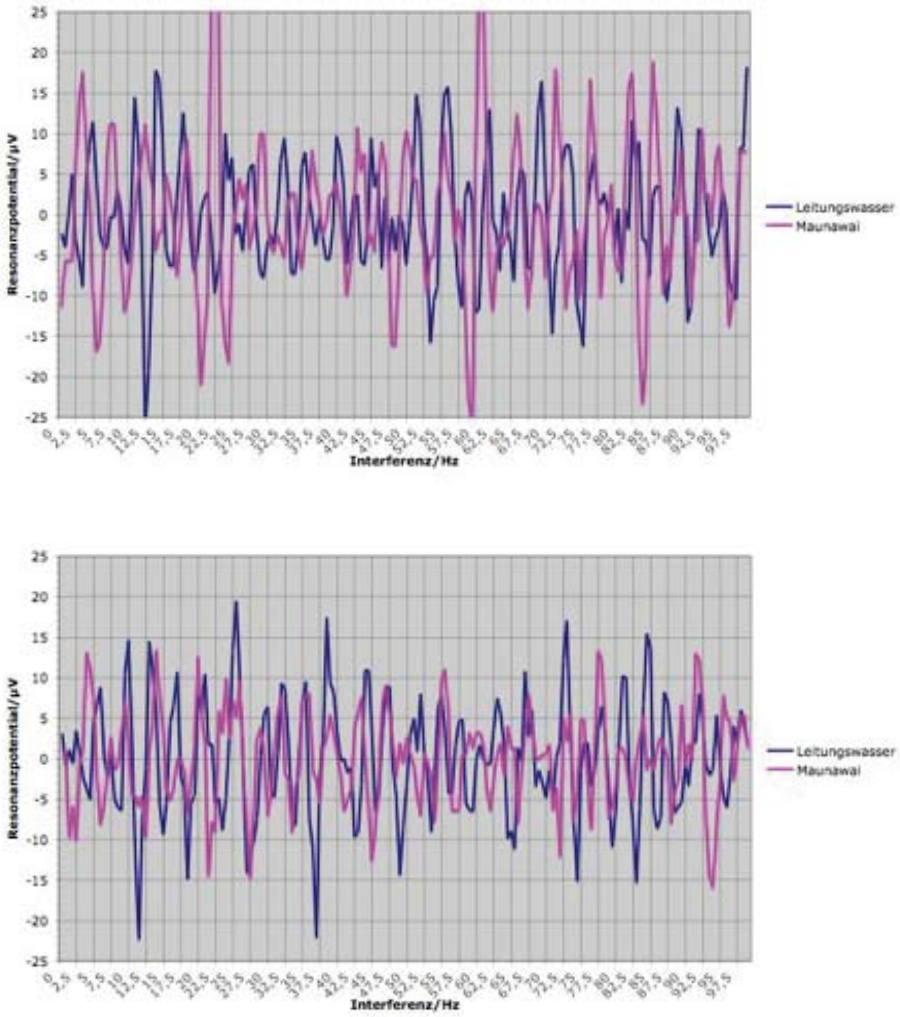
4.2 Test results

"Phase coherence spectra" of this kind were recorded for tap water before and after filtering through the MAUNAWAI system. Measurements where the magnetic stimulus had "left (–) and right (+) circular polarisation" were distinguished according to rotational direction. There are therefore two measurements for each sample, with the results (spectra) graphically superimposed for comparative purposes.

These spectral representations are shown in figures 1 and 2. The relevant frequency can be read on the x axis. It is generated as "interference" and is therefore labelled as such in the graphs. Resonance signals are recognisable as spikes above or below the overlaid curves.
They are applied as electrical voltage (resonance potential) in microvolts (µV, millionths of a volt).
Even non-experts in the field of spectroscopy can identify the points on the graphs where the superimposed curves representing MAUNAWAI filtered water and the tap water used for comparison are identical or similar, and where they differ significantly.

Some signals are extremely prominent in MAUNAWAI water but were not present in tap water, while some are only pronounced in tap water and not after filtering with the MAUNAWAI system.

This alone indicates that water is considerably different after passing through MAUNAWAI filter layers than before.



Figures: 1 and 2
Spectral representations of the electromagnetic signals in tap water and in MAUNAWAI filtered water in both rotational directions of the magnetic stimulus

4.3 Evaluation

Particularly striking in the spectra of MAUNAWAI filtered samples with (+) circularly polarised stimulus are the signals at 22.5 Hz and at 61.0 Hz, which were not previously present. Both signify extremely biologically important functions.

German bioresonance pioneer Dipl.-Ing. Paul Schmidt has already associated signals at the frequency of 22.5 Hz with cell renewal, cell membranes and – with the wrong polarity – with cancer. The British electrophysicist Prof. Dr. Cyril W. Smith determined that water resonance at 22.6 Hz is associated with polygonal geometry in water. Thanks to one of the winners of the 2003 Nobel Prize for Chemistry (Peter Agre), we know that the transportation of water molecules through cell membranes is an electromagnetic process. Moreover, it is now known from cell research that the cell membrane (and not only the cell nucleus!) is extremely important in controlling what happens in the cell. In summary, these findings mean that a positive resonance signal at 22.5 Hz in the water signifies that the water has a biologically regenerative effect, optimum cell mobility, and facilitates order (coherence) in cells. The fact that the MAUNAWAI filtration process makes this **vital frequency** so pronounced is evidence of an **essential vitalisation process.**

▸ MAUNAWAI filtration provides water with **properties similar to those of cell water.**

At 61.0 Hz, the other resonance signal in the water which is made strongly pronounced by MAUNAWAI filtration is **in the biological resonance range of the ear** (our sensory organ for longitudinal or scalar waves, e.g. sound waves) and various **intestinal segments.** Considering the proverb "death begins in the intestines", there can be no doubt about their significance to health.

4.4 Impact of "electrosmog"

The fact that **electromagnetic signals can be imprinted in water** also presents a considerable **risk to water quality**. Natural or technical waves with the "wrong polarity" (e.g. geopathic zones or radio waves) can have a serious negative impact on the quality of water (visible e.g. through contamination or algae growth).

This raises the question of **how resistant MAUNAWAI filtered water** is to harmful electromagnetic fields. Does it retain its unique biological quality under the influence of "electrosmog", or can it be made resistant enough that it is able to do so?

Generally, it can be said that water with a very well-formed structure is also fairly stable against electromagnetic interference. In tests using the evaporation image method (section 3) it was found, for instance, that MAUNAWAI filtered water also showed a good drop structure

under the influence of mobile phone radiation, with only the outer edge becoming thicker.

In many households, offices, etc. there are now considerably more dangerous influences on water. Cordless telephones (DECT standard) for example contain a very small radio transmitter in the base (often incorrectly believed to be only a charging stand). As with mobile phones, the radiation emitted is microwave radiation, but the transmission strength of a DECT base is considerably higher than that of a mobile phone. In addition to this, older cordless telephones emit radiation at all times, and not only when calls are made or received. Other signal sources such as Bluetooth or W-LAN often emit lower levels of radiation, but use the same frequency as a microwave oven, namely a water resonance frequency at 2.45 GHz (Gigahertz).

To investigate whether water filtered through a MAUNAWAI device can withstand such "strong" electromagnetic stress, or be protected against it, two samples of MAUNAWAI filtered water were exposed to radiation from a DECT base. One was also fitted with one of the latest safety devices (OPET brand). This is a small plate constructed of two different materials sandwiched together. A strong regulating field is created at the boundary between the outer metal and the inner mineral.

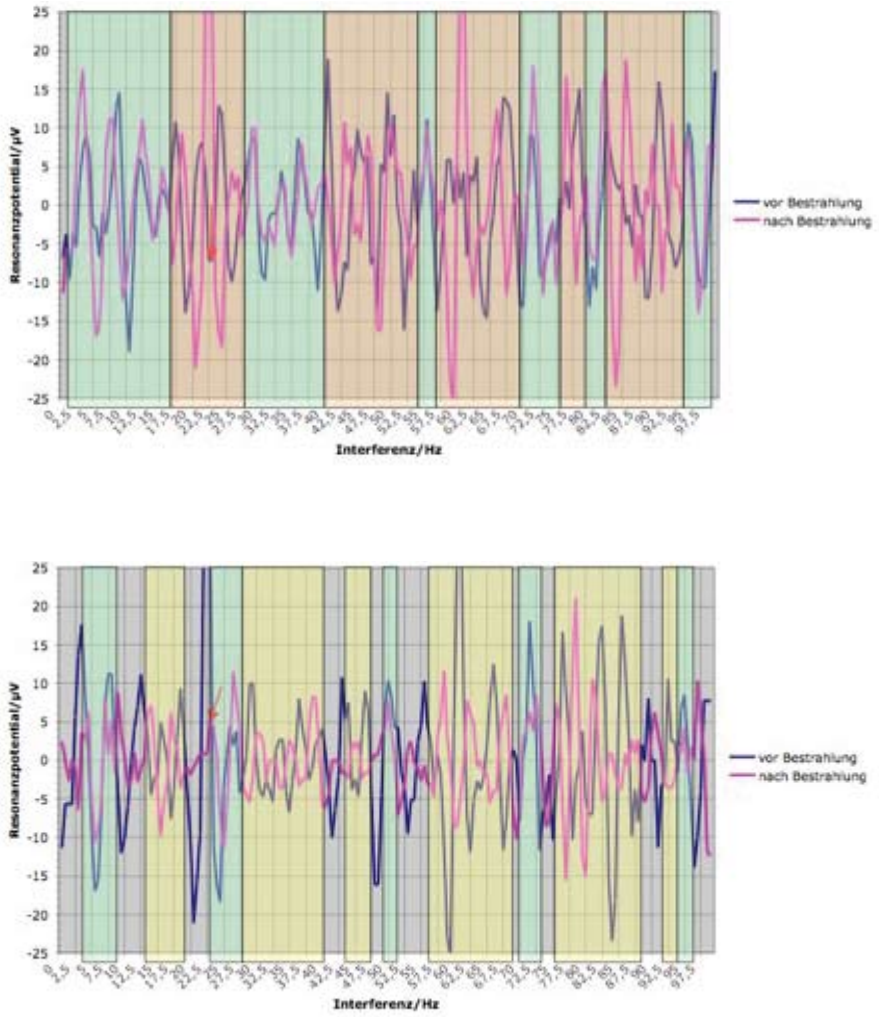
Figures 3 and 4 show the spectra of MAUNAWAI filtered and DECT exposed water in comparison with unexposed water. In one case, the exposed water had OPET protection while in the other it did not.

The reproduced spectra relate to measurements where the direction of magnetic rotation was to the right (+), as the unexposed MAUNAWAI sample shows particularly strong biologically relevant signals with this type of "circular polarisation" (see section 4.3).

The ranges highlighted in green in **figure 3** (next page, top) show that, across substantial ranges, this does not change when MAUNAWAI filtered water is exposed to radiation, proving that the water is remarkably resistant. In the ranges marked in orange, however, the shape of the spectral curve changed significantly – hardly surprising when massively bombarded by intense pulses of DECT microwave radiation. The red arrow shows that the unique 22.5 Hz signal in MAUNAWAI filtered water lies in one of these altered ranges; it has been weakened and the polarity reversed.

In **figure 4** (bottom) (exposure with OPET protection), as well as unchanged ranges marked in green, ranges marked in yellow can be predominantly seen. This means that a natural swing process took place in these ranges, as can generally be observed in water samples. Here, the positive 22.5 Hz signal was preserved, on the edge of a "green" frequency range with unchanged oscillation!

Thus the **MAUNAWAI sample with OPET protection** demonstrated a particularly effective way of **preserving the natural oscillation of the water with no detrimental effect** from pulsed microwave radiation on the **unique biological quality** created by the MAUNAWAI process.



Figures: 3 and 4
Spectra of MAUNAWAI water before and after DECT exposure;
a) without OPET protection during exposure (top), b) with OPET protection during exposure (bottom).

Highlighting: green = no change through exposure; yellow = reversal of the signal sign, but a mirror image of the spectral curve; orange = altered curve shape.

5. Overall assessment

These measurements, analyses and tests of the MAUNAWAI filter system offer a well-rounded overview of the excellent properties of this water treatment technology:

- **effective removal of inorganic and organic pollutants** (particularly impressively proven for heavy metals, polycyclic aromatic hydrocarbons, pesticides...)

effective regeneration of the structural water quality discernible in the evaporation image when this has been negatively affected by contamination or traditional filtration,

- **excellent cell mobility or similarity to cell water**, proven by a positive resonance signal at 22.5 Hz; the extent to which this is pronounced is a unique characteristic of the MAUNAWAI system;

- **good resistance against the detrimental effects of electromagnetic interference** (**"electrosmog"**), which is also maintained in the event of intense exposure to pulsed microwaves **through the use of a simple protective measure** (the regulating boundary effect offered by the latest protection).

▸▸ Overall, the **MAUNAWAI Water System** can be certified from a biophysical perspective as having **an excellent capacity for purifying, structurally activating and vitalising water**. The results prove that water filtered by MAUNAWAI comes astonishingly close to the ideal of similarity to cell water.

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Electromagnetic Compatibility
on a biophysical basis

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Electromagnetic Compatibility
on a biophysical basis
Engineering office specialising
in environmental technology

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