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The True Costs and Benefits of Water Ionizers

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1 Recently I have been asked to explain the differences between Enagic's water ionizers and others on the market so frequently that I decided to answer on paper so more of you would have access to the research I have done over the course of the past 2 years. Since I joined Enagic in February 2005, I have been asked this question 10 or more times per week. The more ionizing companies that begin distribution in the US, the more information pops up on the internet, and the more internet information that is published the more confusion there seems to be on the subject. This is actually a wonderful phenomenon. The more the concept of ionization becomes a well known process, the easier it is to enter into a discussion about water ionization. It actually paves the way to greater understanding in the general public. This is great news! Each time someone visits a site discussing pH or oxidation or ionization, they receive some level of education in another way to assist them in living a more health conscious lifestyle. These educational "bites" also mean that you have less and less education to do to get your potential customer well informed on these topics. Additionally, anyone who purchases any brand of water ionizer is making a positive impact on the environment. They are removing themselves from the hoards of people overburdening the planet with mountains of plastic bottles. So from an environmental standpoint all ionizers are one step closer to a cleaner planet. However, as a consumer trying to educate themselves in order to make a wise purchase, there are many other things to consider. First and foremost, the machine needs to fit the individual's needs, be built to last, and provide true health benefits. Unfortunately, not all water ionizers are created equal, nor are all manufacturers. Kangen Water Therapies, Copyright © 2007

2 Some companies are simply riding on the coattails of the well respected Japanese companies and either inadvertently or purposefully misleading the general public; while other companies are in this industry to stay. To better explain this, let's use the automobile industry as an analogy. There are many

types of motorized vehicles manufactured and sold with the general purpose of moving people from one place to another. These would include manufacturers of luxury cars, farm trucks, and golf carts. Each of these devices has several things in common:

1. They all have motors
2. They all have wheels
3. They all have seats
4. They all have the capability of moving people from one place to another

So theoretically, each could transport you from LA to New York City, however the experience would be dramatically different. You can imagine that a cross country trip in a golf cart is an attainable trip, but when travelling at the speed of 20 miles per hour it would take a very long time to arrive at your final destination. Additionally, while travelling in your golf cart you would be exposed to so many natural elements that you would arrive at your destination in less than pristine condition. Now an old farm truck would be a big step up in speed and protection from the elements, but the ride would still be a bit bumpy and likely not entirely reliable. However, a cross country trip in a luxury car would be a trip one could look forward to taking. The ride would hold everything you were looking for, speed, safety from the elements, comfort and reliability. This same concept is also true of water ionizers. All ionizers are capable of restructuring water. How much, how efficiently and how effectively the water is changed will be dependent upon 2 things – the *quality and configuration of the electrical components* and the *composition of the filtration media*. These factors encompass 90% of the differences from one manufacturer to another and should be *the deciding factors* in purchasing an ionizer. The additional 10% is simply price. Any prudent, health conscious consumer will consider a water ionizer an investment in long term health. Therefore it would be wise to choose a machine which is capable of producing the best results over the longest period of time. To do less would simply be throwing money away.

However, it has been increasingly difficult for consumers to make that determination due to all of the distributor hype, false information and out and out lies published on the internet. Kangen Water Therapies, Copyright ©2007

3 So it is my goal that this document provides distributors adequate explanations and information to assist true information seekers make informed decisions. Over the past two years I have noted that there seems to be a pattern in the questions that are asked repeatedly. Each time a new or existing ionizing company rolls out a new product there is a flurry of excitement, a resurgence of poorly documented information and a lot of press released on the subject of water ionizers. All of this new energy generally results in at least one

new distributor who is on a mission. Unfortunately, the newest “expert” generally has little or no real background to truly understand the chemistry, physics and pathophysiology necessary to separate fact from fiction. When that happens some new article is posted on a website that causes a stir. Newcomers to Enagic who are not accustomed to these attacks begin to get questions from potential customers and are unsure how to answer them. I will attempt to remember all of the questions since early 2005 and answer them to my fullest ability in this document. The two most frequently asked questions these days revolve around a **paid advertisement** that a Jupiter distributor posted in early 2007. It poses itself as an article debunking the myths and facts around Kangen Water™. In actuality it is strictly an advertisement used by both Jupiter distributors and Life Ionizer distributors. It is NOT an article written to lay out facts and myths – it IS a sales promotion piece. I am going to begin with that sales promotion piece. In the following paragraphs the sales promotion article will appear in red while my response will appear in black. Interspersed in the discussion I will include information on various other water ionizing units as they relate to a particular topic. This article is written with the intention to address some of what is been said on other websites and in public meetings, so that customers wanting the best value for their money, are able to make an informed opinion about “Kangen water” without the hype. This article is nothing but “hype”. The authors and Jupiter distributors who sponsor this article actually pay a monthly fee to the search engines to have it appear in the colored box at the top of the page. Those spots are reserved for advertisers. From my vantage point very little of what has been written is based on scientific fact or truth. **Myth 1:** Kangen water is different from alkaline, ionized water. Kangen Water Therapies, Copyright ©2007

4 **Fact:** The Enagic water ionizer contains a filter and ionizing chamber just like all other water ionizers. Just to kick this discussion off, Kangen Water™ is a trademark owned by Enagic. It is Enagic’s trademarked name for ionized, alkaline water with a high –ORP or antioxidant potential. Enagic’s water filters and plates are actually quite different from those used by all other water ionizing manufacturers. These differences, which will be discussed in detail, do make a dramatic difference in the quality of the water that is produced. Let’s begin by discussing the ionizing plates which make up the chambers. Electronically restructured, ionized water is produced when water passes over electrically charged metal plates (a more complete explanation follows on the next page). It is an irrefutable law of electricity, chemistry and physics that the higher the electrical voltage a plate can sustain and the longer period of time water stays in contact with this voltage, the more complete the ionization process. So in terms of ionization “bigger really is better.” Enagic’s LevLuk series utilizes 4 ¾ X 7 inch titanium plates that are heavily coated with platinum. Unlike any other ionizing units available at this time, Enagic’s LevLuk SD501 uses 7 of these plates. Other water ionizers use much smaller and fewer plates (Fig. 1a & b, 2). Kangen Water Therapies, Copyright ©2007

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Figure 1 – SD501 Compared to Others Figure 2 – Inside Jupiter’s Unit – Note the Size of the Ionizing Chamber Since both of these metals are quite expensive, it is the plates that dictate the price of the machines. (A few months ago I actually weighed the plates on a postal scale and Enagic’s SD501 plates weighed 2.75 pounds.) At this time platinum costs \$1250/oz and titanium costs have dramatically increased in the past 2 years with food grade titanium selling above \$400/lb and medical grade above \$1400/lb.
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Last year the Jupiter Company ran a campaign that announced that “Bigger isn’t Better!” This was a part of an advertising campaign to inform people that they had developed a technique utilizing mesh, rather than solid, ionizing plates to increase surface area without increasing plate size (Fig. 3). *Figure 3 – Jupiter’s Mesh Plates* This sounds reasonable to people who are not well informed on the subject of ionization. And it is a wonderful way for the manufacturer to *save a lot of money in production*. However, it has some very serious flaws. A thorough explanation will take several paragraphs. Just so you won’t get lost this text the explanation of ionization will appear in blue. As most of you already know, ionization happens when water, HOH, dissociates into H⁺ and OH⁻. The most efficient and effective way to accomplish this utilizes electricity. When electricity passes through water this dissociation happens quickly. The greater the electrical charge and the longer the water is exposed to this electrical charge, the more complete the ionization. That is why water ionizing units use metal plates. Metal plates conduct electricity, and that electrical charge is what causes the dissociation of the water molecules. This brings up several points to consider:

1. Some metals are better electrical conductors than others. For instance, some manufacturers use aluminum, stainless steel, copper, white gold or metallic alloys. The most reputable companies use titanium and platinum.
2. During the electrolysis process these metals give up varying amounts of their metal into the water.
3. Titanium is chosen because it is a very dense metal. This makes it a good conductor of electricity over a very long period of time. Additionally, its density keeps it from readily breaking down in water. That is one of the reasons it is the preferred metal used in medical grade screws and pins to hold bones together. However when it does break down, it is considered toxic to the body.
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4. Platinum is chosen because, unlike titanium, in minute amounts it is actually a trace mineral that has many health benefits.

5. The more heavily coated the plates, the longer it will take to break down the platinum and expose the titanium. (Of course the heavier the coating, the greater the manufacturing costs.)

These points are very important factors. Jupiter's mesh plates are made from titanium coated with platinum. While this mesh will conduct electricity, there are 3 distinct drawbacks to using wire mesh:

1. Wire mesh cannot conduct as high an electrical voltage as a solid piece of metal.
2. The higher the voltage passing through these mesh wires, the faster the metal degradation.
3. This results in a machine that has a shorter useful life.

In other words, each time electricity passes through these wires that create the mesh, more platinum is breaking down into the water. While that, in itself is not harmful to the body, it means that the titanium will be exposed sooner – and that *is* harmful to the body. That is the very reason that bigger, more dense titanium plates with a thick platinum coating offer a more effective *long term* solution. These plates will consistently produce a more complete ionization process and will last much longer. Unlike any other company, Enagic offers a 5 year warranty because their units are made to last. Gold Fox Company utilizes white gold rather than platinum. From the standpoint of durability, white gold is a much softer metal than platinum. Therefore as electricity flows through the plates the gold will rapidly break down exposing the titanium plates in a relatively short period of time. As pointed out in the paragraphs above, the coating medium provides a buffer to keep the titanium from coming into direct contact with the water. The faster that buffer breaks down, the sooner the machine becomes a health liability. Some Chinese and Korean ionizers have used stainless steel and aluminum in their ionizers. Utilizing these inferior and much less expensive metals in the ionization process would create water that is actually hazardous to health. Kangen Water Therapies, Copyright ©2007

8 As I stated earlier, the most reputable manufacturers of water ionizing units all use titanium plates coated with platinum. The following is an excerpt from an official LifeIonizer website: This continuous flow model is designed for countertop applications and is constructed with two built in pre-filters that total 12 stages of filtration.

Highest pH of any Ionizer

Highest ORP - Anti-Oxidant level of any Ionizer

Twin Filters

Five (5) Year Warranty Produce strong anti-oxidant water typically exceeding -850 mV

Platinum coated titanium electrolysis plates

Device has been designed and built with 12 steps of purification. (Patent obtained)

Functions are activated or utilized easily by one-touch controls.

At this point I will address only the topics of pH and ORP. They boast producing water that is the highest of any ionizer, but their range is pH 3.5-10. That statement is inherently flawed. If the highest pH it produces is pH 10.0 then the lowest pH it can produce is pH 4. Remember pH is measured on a scale of 0-14. This is a very simple mathematical exercise; add the pH number from the acid hose to the pH number of the alkaline hose and the total will always be 14. This is just a function of physics and chemistry. While official test data on the ORP readings is not yet available, field testing in the Bay Area revealed low positive ORP numbers when tested side by side with Enagic's SD501 which achieved high negative numbers. This is in direct opposition to the statement above which claims the "highest ORP - Anti-Oxidant level of any Ionizer. Advertising and marketing hype is one thing but misrepresentation of the facts to create a better market niche lacks integrity in the marketplace. The next topic of discussion is filtration. While platinum coated titanium plates are unarguably the industry standard, differences in filtration styles and mediums have been used in an attempt to distinguish the companies from one another. This is one of the areas where manufacturers have made some wild claims about their filters. Filtration is a VERY IMPORTANT topic. The main job of any filtration medium should be to remove unwanted, potentially harmful debris and chemicals from the water without removing the minerals necessary for ionization. Kangen Water Therapies, Copyright ©2007

9 Enagic's filters accomplish this by using 3 components (Fig. 4, 5):

1. Calcium Sulfite (CaSO_3) used for its biocidal or disinfecting properties a
2. Antibacterial granular activated carbon
3. Mechanical filter that filters to 5 microns

Fig. 4 - Enagic Filter Fig. 5 - Enagic Filter Dismantled When dismantled there were only 3 components, those listed above, nothing more, nothing less. In the photo above the calcium sulfite and all of the granular activated carbon had been removed, leaving only the mechanical filter. I have researched the official Jupiter website and spoken to several Jupiter distributors to get full disclosure on the contents of their newest filtration media. Below you will see a diagram from the official website. As you can see, Jupiter's filters use varying amounts of Coral Calcium, Tourmaline, activated granular carbon and 4 layers of fiber filters in the .1M filter. In the .01M filter as much as ¼ of the activated carbon has been replaced by an ultra fine filter (Fig. 6). Kangen Water Therapies, Copyright ©2007

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Fig. 6 – Crosssection Images of Jupiter’s Filter Diagrams Since this subject of the filters is quite extensive, the major points will appear in black, while the research in will appear in blue to help you make it through these topics more easily. **Coral Calcium:** In the past, Jupiter called the coral calcium Biostone. Recently this has been revised and is now referred to in their literature by its actual name, coral calcium. Some of you may be unaware of the fact that in order for minerals to be bio-available the human body they must come from a **plant source**. Coral is not a plant, it is an animal. So, much like calcium from bovine sources, it is not bio-available to be used by our bodies. So what becomes of that excess calcium in our bodies – it creates stones like kidney stones and gallstones; it produces calcium deposits that can become bone spurs or joint deposits that create painful joints. It can cause hypercalcemia which can lead to a whole host of horrible symptoms including death. Kangen Water Therapies, Copyright ©2007

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On a less dramatic note, I have yet to find *tap* water in the US that doesn’t already have too much calcium. This excess calcium creates lime deposits on our plumbing fixtures and can quickly coat our ionizing plates. This coating diminishes the flow of electricity through the plates, resulting in incomplete ionization of the water. When tap water is not completely ionized, many of the pollutants present in the water are not separated out and end up in the drinking water. **Tourmaline:** One of the items they report is that tourmaline produces an electrical charge emitted into the water as far infrared energy. After a solid week of researching tourmaline I have discovered many disturbing facts about this gem stone. The list is quite extensive, so I am going to print it in blue again so that you don’t get lost.

1. Some tourmalines can produce an electrical charge, called pyroelectricity, when the stones are heated. Under these circumstances the stones yield a positively charged end and a negatively charged end.

This is a definite problem since the water passing through the units is cold rather than hot.

2. The other way to produce an electrical charge is to apply pressure to a tourmaline crystal in the specific direction of the vertical crystal axis. The stones in their official rendition of the filter are rounded pebbles. They do not appear to be laid in a specific direction to expose the vertical axis. Additionally, there is no pressure applied.

3. Tourmaline is comprised of many minerals which dissociate in water. Below is a partial list of minerals as well as a few of their potential toxic side effects:

- a. Sodium – hypertension

- b. Calcium – kidney & gallstones, bone spurs
 - c. Lithium – hallucinations
 - d. Iron – heart disease, especially in men and post-menopausal women
 - e. Aluminum – linked to Alzheimer’s (upon autopsy Alzheimer’s patients had 4 times the accumulation of aluminum than considered normal)
 - f. Silicone – excessive bruising, stomach irritation, rashes
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12 g. Boron – interferes with normal estrogen and testosterone hormone production & hair loss

Micron Filter: At .01 micron filtration, too few minerals present for complete ionization. Electrolysis requires adequate minerals. Too many or too few minerals impede complete ionization. Once water begins to lack mineral content, it becomes more acidic and more oxidizing. It will then lock on to any minerals it can. It is reasonable to assume that this filtration process would encourage the transfer of minerals from the coral calcium and the tourmaline into this filtered water. If these minerals could be utilized by the human body, this would be a great big plus factor. However, since they are not bio-available to humans and can cause tremendous health risks, this is not a desirable feature. **12 Stage Filtration:** LifeIonizer, a Korean manufacturer, equips their units with 2 separate filters. Each is billed as a 6-Stage filter. The official product specifications for the filters are as follows: **Specially devised, high quality 6 Stage filter:** Life Ionizers have the most comprehensive pre-filters available on the market today. Each unit has two built in filters totaling 12 stages of filtration/treatment. **Stage 1** Pre Filter Relatively large contaminants such as sand, dirt, residue are removed prevents Special Block Carbon Filter from being contaminated **Stage 2** Special block carbon filter Removes unpleasant tastes and odors, residual chlorine, environmental hormones which easily dissolves into water and trihalomethanes **Stage 3** Poly-Ethylene Filter Removes microscopic and contaminated substances that could not be removed from the previous filtering process **Stage 4** Active Carbon Filter Removes chlorine, deposits formed and floating in water, trihalomethanes (mixture of organics with chlorines), residual chlorine, and volatile organically combined substances. Kangen Water Therapies, Copyright ©2007

13 **Stage 5** CaSO₃ H₂O Adds alkaline minerals **Stage 6** Silver-Added Active Carbon Preserves the beneficial alkaline minerals and removes unpleasant taste and odor from water. As mentioned earlier, field testing 2 different LifeIonizer units produced very dismal ORP results – these readings were actually positive numbers – I was compelled by curiosity to determine what could create such appalling readings. A filter set was purchased and dismantled to verify all 6 of the separate filtration medium specified on the website in an attempt to rule out the filtration as the source of the problem. If it was just the filter, the problem could be easily solved by making a few minor adjustments. The two filters were carefully sawn in half to reveal the contents in as undisturbed a fashion as possible. Much to our surprise

there were only 2 things to be found in those filters – granulated carbon and a poly-ethylene filter. There was no block carbon, no CaSO₃ (Calcium Sulfite), and no pre-filter to be found. (Fig.7) This was true of both filters. *Figure 7 – LifeIonizer Filter Cross Section Cut – Resting on its Granulated Carbon* Kangen Water Therapies, Copyright ©2007

14 UV Light: Akai, another Japanese manufacturer, has the most unique approach to killing microbes present in the water. Akai utilizes a UV light to destroy undesirable microbes. While complete ionization should kill any microbial content in the water, Akai took an extra step to be certain. The remainder of their filtration utilizes activated granular carbon as well as a mechanical filter. **Myth 2:** Kangen water is better than alkaline, ionized water **Fact:** There are 2 ways the quality of Kangen or alkaline water are measured – by how acid or alkaline the water becomes (pH) and by how much ionization occurs (ORP). As I pointed out in the previous “myth” point, Kangen Water™ is Enagic’s brand of alkaline, ionized water with a high –ORP. The very measurements that are mentioned, pH and ORP, are what sets Enagic’s units apart from all of the competitors that I have tested to date. Enagic’s units produce a stable and consistently higher pH and –ORP than other units. Each time I have tested the water from my SD501 in my kitchen, the pH holds at 9.75 for 21 days in a closed container out of excessive heat; and the ORP tests consistently at -925mV and holds at -900mV for up to 56 hours if stored in a dark glass bottle with a tight fitting lid on my countertop. Because all water sources are different, your results may vary. Over the past 2 years I have regularly called various Jupiter dealers to obtain information. I am always honest and tell them that I am doing research on water ionizers and I want to know anything that they can tell me about their machines. I was proudly sent to this site recently by a distributor. They consider this unit to be roughly equivalent in their line to our DX or DXII units. At the time this test was performed, Jupiter was claiming that they could achieve a -800mV ORP from the Melody. But when I pressed the salesman, I was told that the normal readings were about -175mV. Kangen Water Therapies, Copyright ©2007

15 Tests performed in my own kitchen, using the same tap that is used to produce my Kangen Water™, showed that the Jupiter Melody consistently produced water which tested at only a -120mV ORP with a pH of 9.6. Another factor is that the ORP dropped at an alarming rate when stored in a dark glass bottle with the same parameters utilized with the Kangen Water™. After only 2 hours the ORP had dropped to -20mV. These tests indicate the lack of stability in the water which would generally be attributed to incomplete ionization, a direct result of inadequate ionizing plates. The following chart was copied from a *Jupiter website* with test results: The following analyses were performed by certified laboratories on water from a Jupiter Mavello ionizer, a model similar to the new Jupiter Melody.

Oxidation-Reduction Potential and pH:

Ionized Level	O.R.P.	pH
Tap Water	+ 10mV	7.0

Level 1 alkaline	-165mV	8.7
Level 2 alkaline	-185mV	9.7
Level 3 alkaline	-215mV	10.3
Level 4 alkaline	-248mV	10.8
Purified Water	-20mV	7.2
Super Oxide (Acid)	+65mV	4.5
BEST O.R.P.	-90mV to -250mV	

Thank You!

If health is your passion then you will love Kangen Water™
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