

## PiMag® water systems tests

The quality of the water that we put into our bodies is extremely important. Doesn't it make sense to replenish all of our body's vital organs, bones and tissues with the best water we can?



Nikken's PiMag® water systems were developed to create mineral rich water from the already safe drinking water from your tap. Nikken are aware that water quality differs between countries, regions and even cities and towns. Water that arrives to your home has normally been treated by the local water authorities. This treatment tends to include adding chemicals such as chlorine to the water to help kill bacteria, but this can obviously make the water both taste bad and smell.

Recently, Nikken arranged for the water systems to be tested in laboratory conditions at a site in the UK that provides the South East of England with their water. This laboratory is based at a reservoir and is testing water quality on an hourly basis.

Results in the two tests have shown that the smaller PiMag® water system removes high percentages of contaminants along with adding minerals to the water. The 3-stage filtration of the PiMag® Maxi has shown further improvements in contaminant reduction and mineral addition proving that the larger capacity of the PiMag® Maxi can perform extra reductions in areas that have high levels of contaminants such as metals.

### 30-day filter trial tests

Our first project was a 30-day filter test on both the PiMag® water system and the PiMag® Maxi.

In conjunction with our laboratory we set up a filter test that consisted of three systems, the PiMag® water system, the PiMag® Maxi with sponge filter and the PiMag® Maxi with ceramic filter.

Each machine had six liters of municipally treated tap water filtered through each day for 30 days and on set days. Samples of the water were taken and measured against the municipally treated water to provide an average percentage reduction/increase comparison between the two.

Depending on the quality of water these results may differ slightly across Europe.

### Nikken water systems: 30-day filter test results

Name of contaminant	PiMag® water system 1335 % difference from tap	PiMag® Maxi 1360 standard filter % difference from tap	PiMag® Maxi Ceramic filter % difference from t
Aluminium	0%	-38%	-56%
Calcium	+2%	+6%	+6%
Chlorine	-59%	-58%	-59%
Fluoride	0%	0%	0%
Iron	-10%	-14%	-99%
Magnesium	+3%	+2%	+5%
Nitrate	-18%	-70%	-70%

Nitrite	0%	0%	0%
Phosphorus	-3%	-20%	-12%
Potassium	-1%	-5%	-3%
Silica	+11%	+29%	+42%
Sodium	-3%	-5%	-4%
Zinc	0%	0%	0%

All the results in the 30-day trial are taken from already safe drinking water.

## Conclusions

The results have shown that both systems have increased the Calcium and Magnesium minerals by small percentages. Calcium helps in regulating nerve transmission, blood coagulation, and muscle contraction. Studies have shown that Magnesium in drinking water protects people with diabetes mellitus, and lowers the risk of heart disease, particularly in females.

Results show a substantial increase in Silica, between 11-42%. There have been many scientific studies on the benefits of Silica in drinking water. Many results, although not conclusive, have shown that an increase of Silica can be associated with a reduced risk of dementia.

Our water systems increased the pH value of the water to between 7.5 and 8 (weak alkaline) by reintroducing minerals that promote ionisation and oxygenation, helping the body maintain its active equilibrium. Alkaline (Ionized) water passes through body tissue more efficiently than conventional water, therefore it hydrates us

more effectively. Alkaline water combats the acid condition caused by our modern diet to help maintain a healthy, disease-fighting system.

The water hardness increases slightly in both systems using all filter variants. Hard water is not a health risk. Hard water means it is high in dissolved Calcium and Magnesium minerals. The National Research Council (National Academy of Sciences) states that hard drinking water generally contributes a small amount toward total Calcium and Magnesium human dietary needs.

In chemical terms, Fluorides are salts of Hydrofluoric acid. They occur naturally in rocks, (drinking) water, air, in flora and in fauna. Our saliva contains Fluoride ions that promote bone growth. Our systems had no effect on the low levels of Fluoride found in the UK water sample.

As the Nikken PiMag® water system and the PiMag® Maxi reduce chlorine, providing better tasting water, there is an element of increased bacteria growth. To combat this, the silver activated carbon releases a small amount of silver into the system. Silver has been used in many water filtration systems and has been shown to have an anti-bacterial effect limiting the amount of bacteria growth.

### **Contaminates spiked tests**

Our second testing project was to see which contaminants our water systems would filter under a spiked test environment. Both systems were fitted with the sponge filter and, using a measured spiked sample of the contaminant, we filtered this through the water systems and re-measured after the filter cycle to provide a

comparison between the two samples.

Our results show that you can expect a further reduction on the already safe treated water by the following percentages.

## Metals

Metals including Arsenic, Cadmium, Chromium, Lead, Copper and Nickel are all regularly tested for by water companies and filtered through their systems to make sure that they do not exceed the regulation PCV (Prescribed Concentration or Value).

### Nikken water system percentage reduction on contaminants

Name of contaminant	PiMag® water system 1335	PiMag® Maxi 1360
Arsenic	51%	68%
Cadmium	86%	99%
Chromium	87%	94%
Lead	65%	93%
Copper	79%	85%
Nickel	65%	90%

Contaminant group	Substances tested	PiMag® Water System 1335	PiMag® Maxi 1360
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Metaldehyde (pesticide)	1	76%	99%
Organophosorus (pesticides)	5	85-98%	95-98%
Chlorphenoxyacetic (herbicides)	17	62-97%	96-99%
Urea herbicides	9	88-98%	95-98%
Organochlorine (insecticides)	12	78-100%	78-100%
Triazines (herbicides)	8	73-92%	93-97%
Chlormequat (plant growth regulator)	1	95%	97%
Trihalomethanes (THM;s)/Solvents	7	94-98%	98-99%
Polycyclic Aromatic Hydrocarbon (PAH)	6	68-97%	68-97%

Nikken has no information on water quality in your area. The substances removed or reduced by this device are not necessarily in your water.

### **Pesticides/Herbicides/Insecticides/Fungicides**

Pesticides, Herbicides, Insecticides and Fungicides are all used in various forms to control weeds, pests and diseases in crops (including grassland). High levels of rainfall increase the risk of these products contaminating water.

Nikken has tested over 60 Pesticides, Herbicides, Insecticides and Fungicides and the consolidated results are shown here.

## **Conclusions**

Where herbicide, pesticide and insecticide residuals are present in a treated water supply, both PiMag® units are effective in significantly reducing the level of contamination. The PiMag® Maxi, with its additional filtration levels, is particularly effective. Both systems will create cleaner water for your enjoyment and safety.

## **Comparisons**

### **Brita**

Information supplied on the Brita website was evaluated.

The Brita system does not filter Fluoride, Phosphates or Nitrates. Both the Nikken systems show reductions in Phosphates and Nitrates.

The Brita system reduces Calcium and Magnesium providing a slightly acidic pH.

Nikken systems increase Calcium and Magnesium providing a slightly alkaline pH.

Brita do not state reduction percentages on Aluminium, Chlorine or Copper.

Nikken have provided reduction percentages for all three substances.

There is no listing of pesticides or percentage reductions on the Brita site.

Our information lists the groups and percentage reductions of tested substances.

It is difficult to compare Nikken and Brita systems directly. However, from the above results both Nikken water systems perform to extremely high standards and are effective in significantly improving the quality of standard tap water.

### **Interesting water fact**

#### **Did you know?**

A recent calculation revealed that it takes 1.5 million barrels of oil to produce the plastic for a year's supply of plastic water bottles in the US. Based on a usage of two litres per day, Nikken sells enough PiMag® and PiMag® Maxi water systems EACH YEAR to replace 16-20 million bottles of water. Nikken has sold these products for many years, so the cumulative positive impact on the environment is substantial.