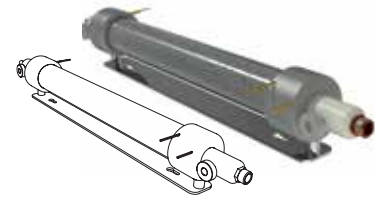


THE ZEOMINERAL AQUA WATER FILTER IS A SIMPLE AND EFFICIENT DEVICE WITH A CLEAR TECHNOLOGY; IT DOES NOT INTERFERE WITH THE CHARACTER OF WATER. THE WATER – AFTER FILTERING – WILL TASTE THE SAME IT HAD TASTED BEFORE BECOMING CONTAMINATED. THE FILTER HAS FIVE EXCELLENT QUALITIES THAT MAKE IT DIFFERENT FROM OTHER FILTERS:

- **It eliminates pollutants in a selective way, retaining the valuable components of water: minerals.**
- **it is economical to operate**
- **it is productive, in relation to its size, its water output is considerable**
- **its installation is the best and quickest compared to any other solutions**
- **there is a wide variety of combinable filtering materials to perform specific water filtering tasks.**



## 1. WATER POLLUTANTS

Although many kinds of materials and influences can ruin our drinking water, the main cause is still humankind by their extracting and cleaning water. At the first hearing, it may sound slightly peculiar, so let's see what we are talking about. There are four main water handling problems:

### THE FIRST PROBLEM IS STERILIZATION WITH CHLORINE.

All over the world the most wide-spread water cleaning technology is based on sterilizing with chlorine. This step cannot be skipped, as without chlorine, the contamination of drinking water networks could cause unpredictable sanitary problems. Chlorine chemically reacts with each and every oxidizable organic and inorganic substance. These chemical reactions successfully remove and eliminate certain pollutants, however, as a result of these reactions, by-products are made, which appear in the water. These by-products are called chlorine derivatives. These derivatives are extremely harmful, as in nature it is uncommon for chlorine gas to chemically react with water. There are a plethora of chlorine derivatives, which are more or less present in tap water. Difficult, special and expensive analytical procedures are needed to trace them, and what is more, no standard covers these pollutants when describing 'quality parameters'. (That does not change the fact that they are pollutants, too.) **The ZM AQUA water-filter is a 'hardware', which is able to filter a wide variety of these chlorine derivatives if using an appropriate combination of filtering substance. The main quality problems of tap water may be eliminated this way.**

### THE SECOND PROBLEM IS SILVERING.

All over the world it is widespread to use hydrogen peroxide combined with silver ions to preserve water. Such a solution is added to PET-bottled still mineral water to inhibit the spread of bacteria causing opacity and flocculation. Silver is an excellent anti-bacterial, anti-alga, and anti-plankton substance, especially mixed with hydrogen peroxide. As the result of the reaction, such OH radicals are formed that have the strongest known oxidizing effect in the world (much stronger than chlorine or ozone!). These radicals kill every living organism. The problem is that they also destroy the flora of the human body. OH radicals oxidize all organic substances they get in touch with, making a plethora of harmful and unknown by-products (it is not characteristic that natural water reacts with free OH radicals). Taking 'anti-oxidant' pills has no use as they lose their beneficial effect, as they are bound. Silver never empties from the human body where it is deposited, it causes further damage. This is called the oligodynamic effect. ([https://en.wikipedia.org/wiki/Oligodynamic\\_effect](https://en.wikipedia.org/wiki/Oligodynamic_effect)) Every form of technology has its advantages and disadvantages. Silver – applied externally – is an excellent antiseptic, but internal deposits are a forever embedded cytotoxine. It causes harm and mutation by altering the metabolism of cells. Heavy metals have the same oligodynamic characteristic feature; this is why they have to be filtered from water. **The ZM AQUA water-filter is also capable of filtering heavy metals with the appropriate filter.**

### THE THIRD PROBLEM IS WATER EXTRACTION AND WATER MINING.

Under natural conditions – before the emerging of humans – the upper 100 metres of the earth's crust did not have as many holes as a sieve. Only in Hungary, there are millions of wells. As a result, the layers of the stratum have been mixed, letting oxygen-rich rainwater penetrate more deeply into the layers, oxidizing the originally reductive, sulphurous minerals. As soon as the sulfidic mineral ore started to oxidize, metal ions bound with sulphur started to appear in water: iron, manganese, arsenic, antimony, lead, mercury and other heavy metals. Organic breakdown products from the surface (humic acid from the decomposition of straw, dung water from animal farms, ammonia, etc.) have an open road into the deeper layers of water. These water pollutants appear in well-water simultaneously. The pumping of wells has an adverse effect, as increased water extraction results in still greater combining and dissolution. (It is not natural for a spring to have a water output of several thousand litres an hour.) What is more, water treatment technologies based on 'traditional' sterilizing with chlorine and sand filtration are not capable of handling these pollutants – neither in a chemical nor in a mechanical way. Filtering heavy metals requires special filtering substances and processes. It seems to be too late to lament on this but we can do something about it. **With the help of ZM AQUA filtering materials, the pollutants of well-water may be bound. A combination of filtering substances is advisable to use because it is the only way to ensure the selective removal of a wide variety of harmful substances.**

### THE FOURTH PROBLEM IS SEWAGE TREATMENT.

Most cleaning processes of communal, urban and industrial waste water work on the basis of 'biological water treatment'. This method is none other than bacteria devouring organic substances found in waste water. Bacteria have half a day to do this. The things they succeed to degrade are taken up by their systems and the leftover (here lies the problem!) reverts back to rivers where water treatment facilities release treated water. Bacteria are of course 'picky', so they usually devour the substances they can easily digest. Substances that are poisonous or unknown to them are left until last or they do not even try to degrade them. Therefore, these 'bad-tasting' molecules will teem in rivers: medicinal residue, organic complexes containing heavy metals, artificial, and unusual molecules. The traditional water supply of cities and towns is carried out by extracting

and filtering the mass of water moving in riverbeds. These filtering systems, based on filtration and sterilizing with chlorine cannot get rid of special pollutants, so the residue that escaped water treatment facilities have free passage to the drinking water network. **The filtering substances of the ZM AQUA water filtering device are capable of extracting organic residue by absorption. Of course, you need to use a combination of filtering substances to have an optimal result.**

## 2. ECONOMY

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The materials making up the ZM AQUA water filtering device (PVC-U, silicone, Teflon, stainless steel) are indifferent to corrosion. The case of the filtering device is everlasting; it will not be damaged by years of active use. Once it is put into operation, only filtering substances have to be replaced from time to time. Thanks to its long lifetime, amortization costs are minimal. There is a wide variety of filtering substance combinations, tailored to suit any tasks or personal uses. **The consumption of water filtering substances is 0.5-1 g/l, depending on the impurity of the water. In terms of money it means 3-6 HuF/l, or 1-2 eurocents/l. Considering the demand for drinking and cooking water for a family of four people, which is 5-10 l/day, the annual cost of filtering substances is no more than HuF 15,000-20,000 or €50-70.**

## 3. WATER OUTPUT

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The maximum conveyance speed of the ZM AQUA is 5l/min. However, **for a full absorption the recommended filtering speed is 0.5-1 l/min.** A quicker outflow may lead to the deterioration of the water quality. (The ideal speed is to be able to count to ten until an average glass is filled.)

## 4. CHANGING FILTERS, DISASSEMBLING AND ASSEMBLING

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**The components of ZM AQUA join to each other with the so called DUXAL technology.** This patented fibre-bonding process is a unique Hungarian invention, used exclusively in the ZM AQUA water filtering device. This bonding technology ensures a faster replacement of the filtering substances compared to any other devices. No tools are needed. Loosening and refastening the bindings takes only pulling out and putting back a fibre. Emptying the filtering substances can be handled by opening a tap. The fresh filtering substances are sold packed in filters. **One load of filter requires two filters.** These two can be the same or different types. Combining two filters makes it possible to use a wide variety of filtering procedures. In case of complex water pollution, **the ZM AQUA filters can be bridged. To attain a higher water output, more filters may be joined in parallel with the help of the above mentioned DUXAL technology.**

## 5. FILTERING SUBSTANCES

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The filters contain filtering substances developed for unique tasks, made of minerals and their combinations. Minerals are mainly volcanic zeolites and other rocks from Tokaj-Hegyalja, Hungary. They were specifically modified to be able to bind individual pollutants. You can use the following replacement filters for the ZM AQUA water filtering device:

- **KLINOMANGANESE-0.5-1.2 mm**  
Catalytic oxidising, binds iron-manganese (capable of binding ammonia and organic substances to a lesser degree).
- **KLINOMANGANESE-0.2-0.5 mm**  
Catalytic oxidising, binds iron-manganese (capable of binding ammonia and organic substances to a lesser degree).
- **KLINOMANGANESE-AS**  
Binds arsenic (iron, ammonia).
- **GRANOFILTER-NaFe**  
Ammonia (iron, arsenic, polaric-organic pollutants).
- **GRANOFILTER-MHZ-T-0.5-1.2 mm**  
General filtering material with activated zeolite, binds colours, odours, colloids (iron, manganese).
- **GRANOFILTER-MHZ-T-0.2-0.5 mm**  
General filtering material with activated zeolite, binds colours, odours, colloids (iron, manganese).
- **STANDARD KMZAC** (basic filtering material)  
Antibacterial filtering material composite with 4 components, binds chlorine, iron derivatives, and chemical residues.
- **FED**  
For the mineralization and alkalisation of 'empty' water.
- **ACTIVATED CARBON**  
Absorbent, binds organic apolaric pollutants, colours, and odours.
- **GRANOSILVER**  
Absorbs viruses, bacteria, contains insoluble silver.

These eight different filtering substances (or their combination) are capable of handling 99% of water filtering, cleaning, and water quality improving problems.

The spent filtering substances do not harm the environment; they originally come from the earth's crust. After use they return to the place of their origin. They may be deposited into solid communal waste bins, may be mixed with humus.

WATER PURIFICATION IS A HIGHLY RESPONSIBLE ACTIVITY. ESPECIALLY IN CASE OF FILTERING WELL-WATER, A PROFESSIONAL OPINION IS NEEDED FROM AN EXPERT WITH A THOROUGH KNOWLEDGE OF CHEMISTRY, WATER CHEMISTRY, AND WATER ENGINEERING. IN CASE THE COMPONENTS OF WATER ARE COMPLEX, A TEST FILTERING MUST BE DONE AND CONSEQUENTLY, A WATER ANALYSIS MUST BE PERFORMED.

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*The laboratory of GEOPRODUCT Ltd provides free technical advice to all interested; contact:  
tibor@geoproduct.hu; +36 30 278 04 26*