

WATER BASICS

WITH BRITA PROFESSIONAL



THINK YOUR WATER

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WATER IS A VITAL RESOURCE

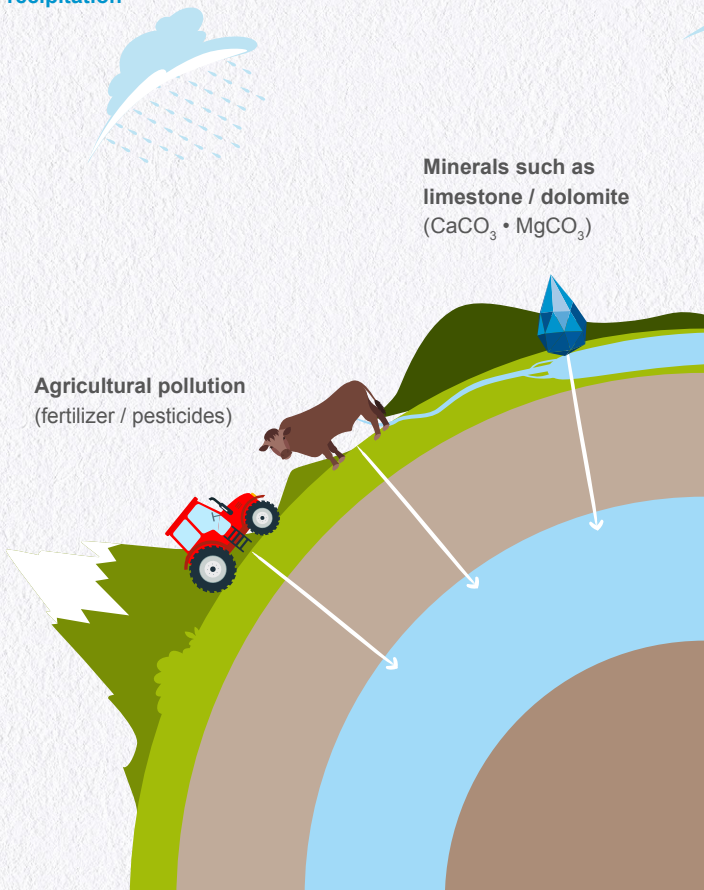


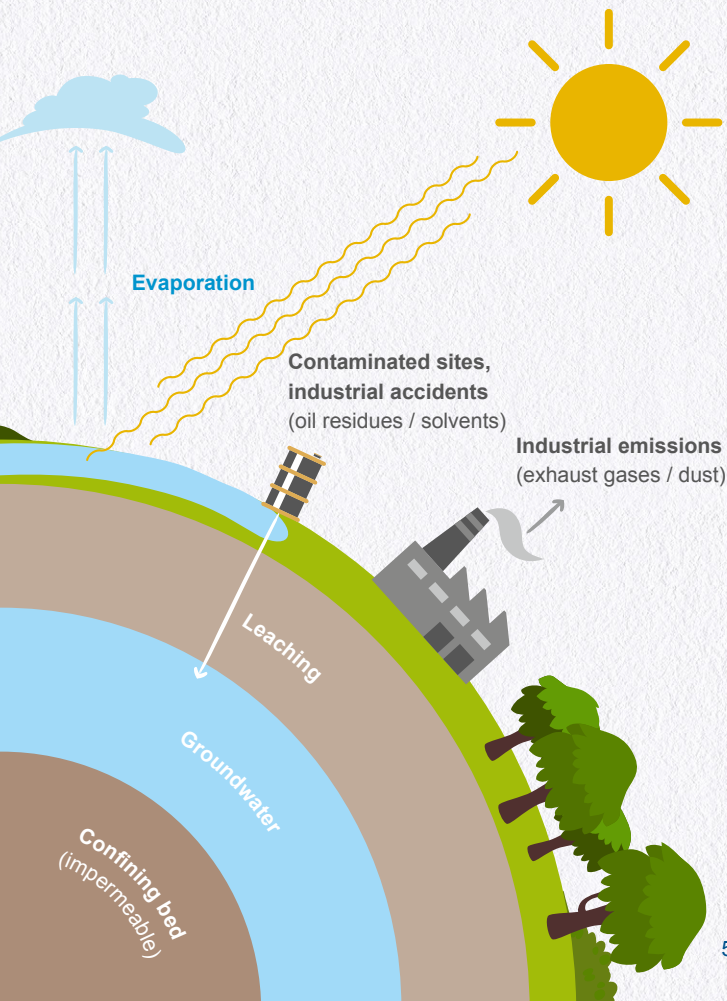
Drinking water is essential – not only to life in general, and as a beverage in its own right, but for making tea or coffee, preparing food, cleaning kitchens and more. In all these scenarios, users want the best possible water for their purposes. After all, proper hydration has a positive impact on health and productivity. Plus, switching from bottled to mains water can help improve businesses' bottom lines. Water is a natural resource of immense value to us all – which is why we at BRITA leave nothing to chance.

We have developed water dispensers and tried-and-trusted filtration technology to create the perfect solutions for a wide range of professional needs – in offices, hospitals, and other workplaces, for satisfied customers, guests, employees and patients. Discover the many business benefits of our proven approach. It will be worth your while in more ways than one.

THE WATER CYCLE

Precipitation





Evaporation

Contaminated sites,
industrial accidents
(oil residues / solvents)

Industrial emissions
(exhaust gases / dust)

Leaching

Groundwater

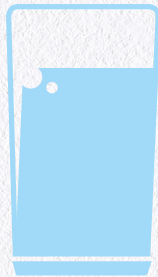
Confining bed
(impermeable)

DRINKING WATER COMPOSITION

Drinking water is one of the most highly controlled foodstuffs in the Western world – and has strict limits on what it can contain.

Water is often called the universal solvent, as it dissolves more substances than any other liquid.

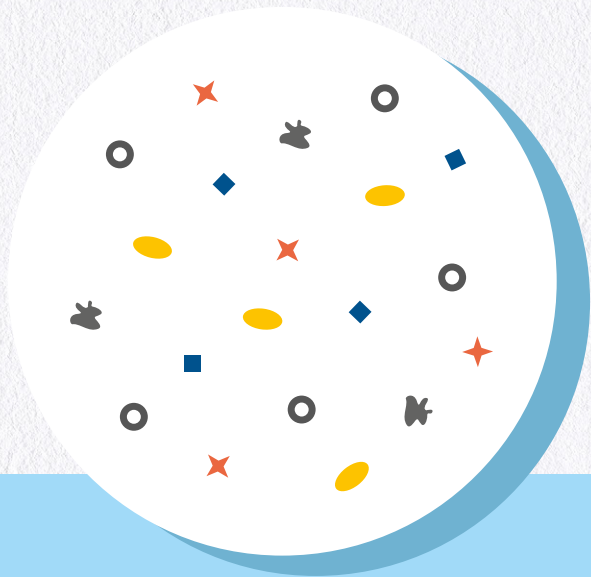
Consequently, water is usually more than simply H₂O – and its contents can vary greatly.



The most important categories are:

| | |
|-----------------------------------------|-------------------------------------------------|
| Substances from the natural environment | (e.g. minerals) |
| Substances from water treatment | (e.g. chlorine) |
| Particles from piping | (e.g. rust, scale) |
| Residues from pollution | (e.g. organic impurities, pesticides, hormones) |
| Microbes | (e.g. Pseudomonas) |

Treatment plants play a crucial role in purifying water and removing undesirable substances to make it safe to drink – a task they perform to consistently excellent standards. However, the resulting potable water can vary in terms of hardness, chlorine levels, aroma, taste, and more.



Total minerals / salinity

- Carbonate hardness or lime
- Permanent hardness or gypsum
- Other minerals (non-hardness)

Undesirable substances

- ★ Odours and off-tastes
e.g. chlorine
- ✖ Coarse and fine particles

To ensure consumers have the best possible water for their specific needs, BRITA offers a broad range of filters to tailor H₂O to their goals and preferences.

PARTICLES

Particles in drinking water typically originate from piping.

Over time, rust and limescale are deposited in pipes in the water supply network. A water hammer (pressure surge) can dislodge these materials. They may then build up downstream in mains-fed equipment, such as coffee machines, causing faults.

The majority of these particles are barely discernible with the naked eye, and range in size from 1 μm to 200 μm .

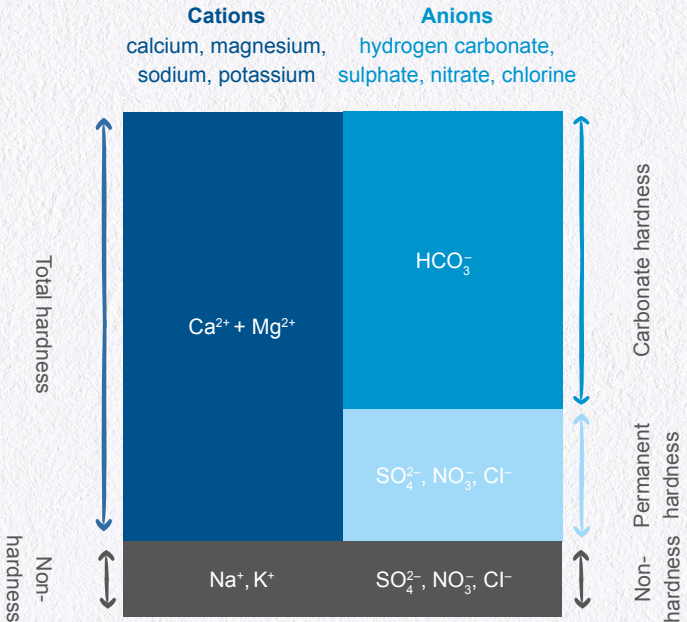


For comparison:

A strand of a northern European's hair has a diameter of approx. 50 μm .

MINERALS IN WATER

Minerals are naturally occurring chemical compounds, and consist of cations (positively charged ions) and anions (negatively charged ions). The most important are:



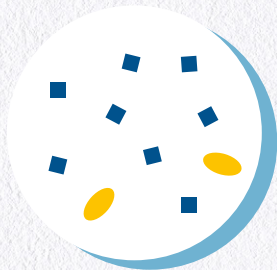
WATER HARDNESS

Total hardness is the sum of carbonate hardness and permanent hardness.

Carbonate hardness as a proportion of total hardness can range between

25 - 90%.

Because the total and types of hardness can vary widely, water filters have to be able to meet diverse requirements – and provide the right water treatment for regional conditions.



Scale water:

carbonate hardness higher than permanent hardness

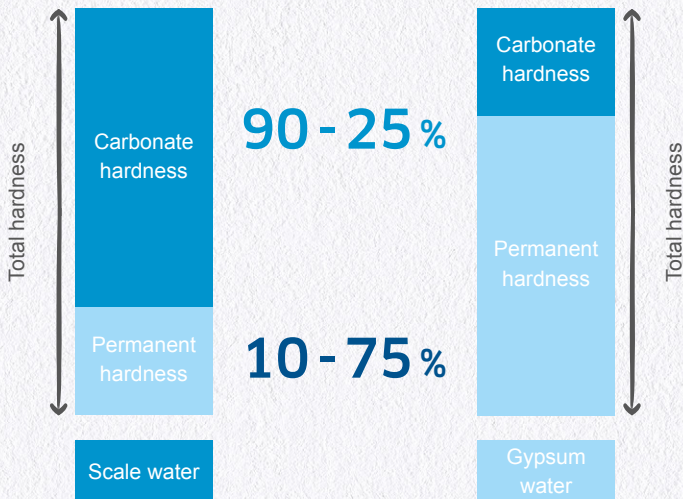


Gypsum water:

permanent hardness higher than carbonate hardness

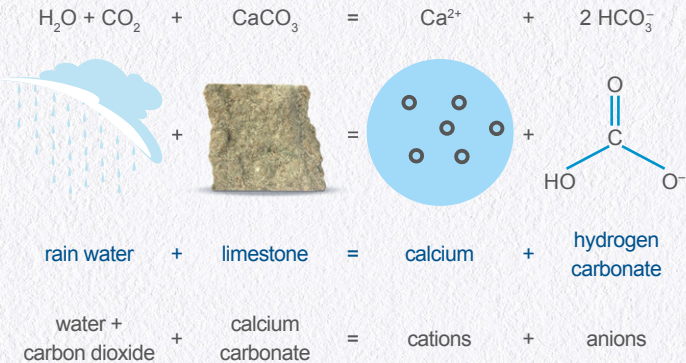
THE RATIO OF CARBONATE TO PERMANENT HARDNESS

The ratio of the two types of hardness depends on the soil conditions near the original water source – as compounds leach into the water supply and affect its composition.



HOW DOES SCALE ARRIVE IN WATER?

- 1 Rain water absorbs carbon dioxide from the atmosphere as it falls to the ground.
- 2 Rain water becomes slightly acidic (carbonic acid).
- 3 Rain water seeps into soil that contains limestone (scale).
- 4 The solid limestone (scale) dissolves and forms calcium and hydrogen carbonate ions.
- 5 The water is now hard, as it contains a high volume of dissolved ions.
- 6 Solid limestone (scale) has become carbonate hardness in water.
- 7 Water has now reached the lime-carbonic acid equilibrium.





HOW DOES SCALE DEVELOP?

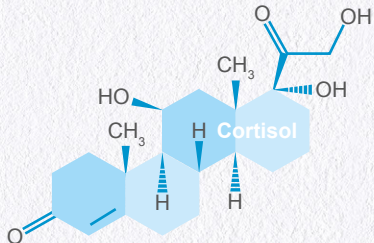
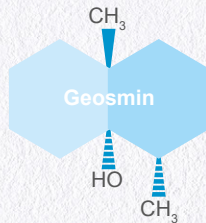
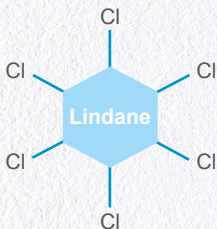
- 1 Water is heated.
- 2 Hydrogen carbonate decomposes into carbonate and carbon dioxide.
- 3 Carbon dioxide gas is released; pH rises, meaning the water becomes more alkaline.
- 4 The lime-carbonic acid equilibrium is disrupted.
- 5 Calcium combines with carbonate and forms limescale.
- 6 Carbonate hardness in water has returned to solid calcium carbonate.

ORGANIC MATTER

Organic matter in drinking water is highly controlled. There are very strict thresholds for many of these substances, for example pesticides. Some are easily detected by the human senses of smell and taste, even in the minutest of quantities – such as the musty, earthy aroma and flavour of geosmin, associated with the smell of rain.

Some examples:

- Residues from pharmaceuticals, pesticides, solvents, industrial products such as paints
- Natural substances, such as residues from algae and bacteria
- Particles



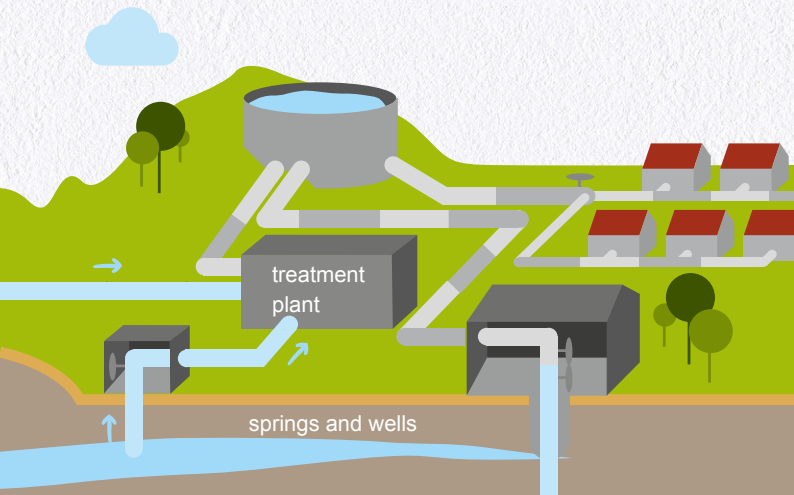
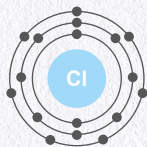
SUBSTANCES FOR TREATMENT

Certain substances are deliberately added to treat water – for example:

- Substances to eliminate clouding (turbidity), e.g. iron or manganese
- Chlorine for disinfection

A small quantity of chlorine is added to disinfect tap water; chlorination is essential, as it kills potential pathogens. However, chlorine, combined with organic residues, can give water an unpleasant odour and unpalatable taste.

chloramines (formed from chlorine and certain compounds) –
characteristic swimming-pool smell



WHAT HAPPENS IF YOU USE THE WRONG WATER

Scale and gypsum deposits



Scale and gypsum deposits due to high carbonate or permanent hardness in the water.

Disadvantages:

- increased equipment downtime
- higher energy and maintenance costs
- spots and smears on cutlery, crockery and glasses

Why filter? → Prevent deposits

Equipment downtime



Equipment downtime caused by a high amount of particles in the water.

Disadvantages:

- solenoid valves do not close properly
- higher maintenance costs
- dissatisfied customers

Why filter? → Protect high-quality machines and reduce costs

Unpleasant
aroma



Undesirable properties in terms of minerals, pH value, appearance and more – but these can be improved by targeted treatment and filtering of water.

Unwanted elements (e.g. chlorine) can cause water to acquire an unpleasant aroma and taste.

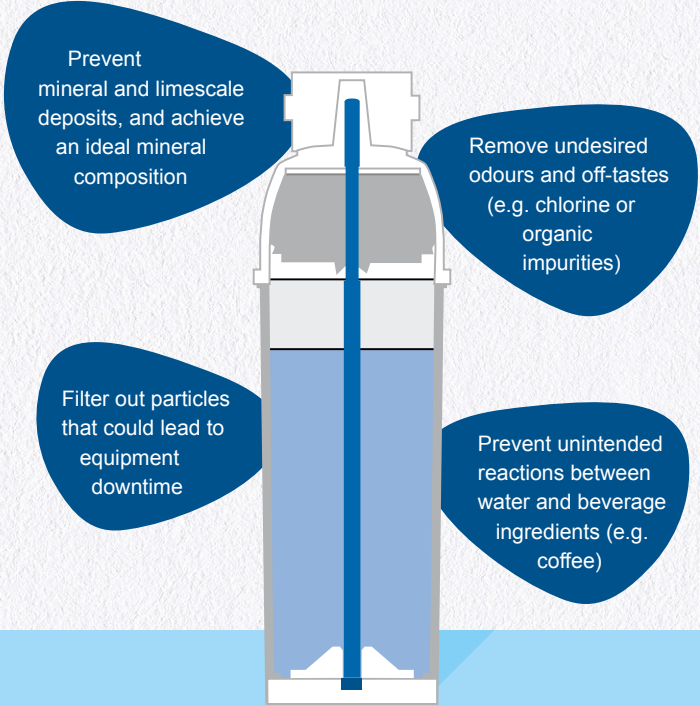
Disadvantages:

- negative impact on taste and aroma
- beverages do not look appealing
- dissatisfied customers

Why filter? → Achieve an ideal composition of minerals and trap undesirable substances

THE AIM OF WATER FILTRATION





FILTER MEDIA - BRITA®

Ion exchanger

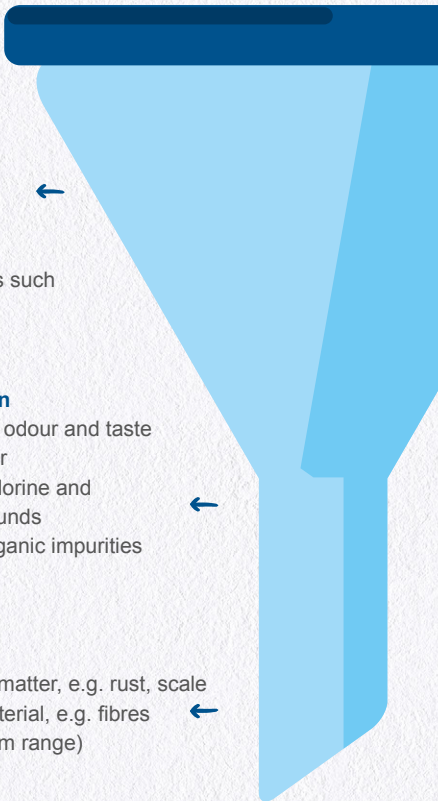
- Decarbonisation – removes carbonate hardness
- Softening – removes total hardness
- Full demineralisation – removes all minerals
- Reduction in volume of metals such as lead, copper, zinc, iron

Activated carbon

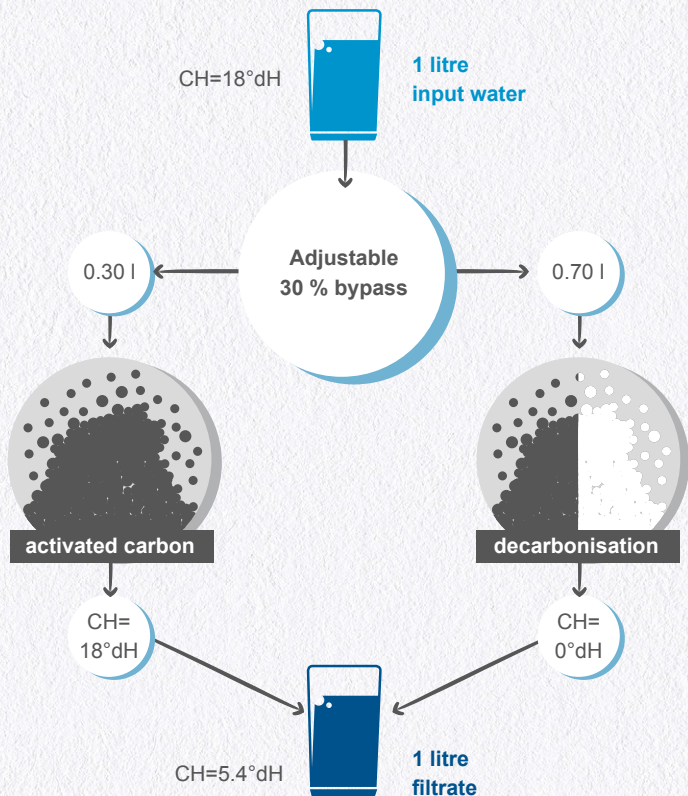
- Improvement in odour and taste of drinking water
- Reduction in chlorine and chlorine compounds
- Reduction in organic impurities
- Decolourisation

Particle filter

- Removal of particulate matter, e.g. rust, scale
- Removal of organic material, e.g. fibres
- Removal of particles (μm range)



WATER BYPASS

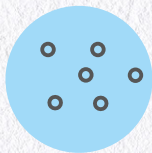


SENSORY ASPECTS



Water is essential to life,
and can stir deep emotions.
It also has an unexpectedly
nuanced and broad range of tastes.

Water is an excellent solvent for a wide variety of substances. As a result, it can contain diverse minerals and other materials that influence sensory aspects, such as taste and aroma:



Minerals
e.g. calcium,
magnesium and
sodium



**Water treatment
substances**
e.g. chlorine,
chloramines and
by-products of
disinfection



Organic compounds
e.g. methylisoborneol,
geosmin and
trichloroanisole

WHY ARE WE
USED TO
THE TASTE OF
CHLORINE
IN OUR
WATER?



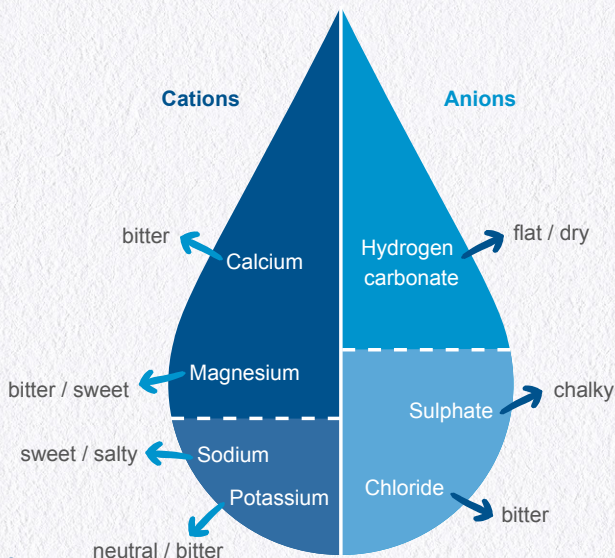
THINK YOUR WATER.

WITH BRITA PROFESSIONAL FILTER SOLUTIONS.

WATER AND COFFEE

The water used in coffee is important – it is, after all, the main ingredient. With this in mind, the Specialty Coffee Association of Europe (SCAE) has prepared a special chart that raises awareness of water as a decisive variable in coffee quality. Anyone who would like to learn more about their Measure-Aim-Treat approach, and how to apply it to brew better coffee, should contact their local BRITA representative.

The taste of water is significantly influenced by the volume and types of dissolved minerals:



WATER AND COFFEE

The taste of water and its impact on coffee

Dissolved minerals can have a significant impact on a coffee's flavour profile, as they affect way the water extracts coffee from grounds. In addition, some minerals interact with components in coffee. Hydrogen carbonate, for example, reacts with coffee acids and, in certain quantities, can lead to a “flat”, unbalanced flavour.

Moreover, substances introduced during water treatment can cause unpalatable chlorine, corky or musty tastes. Some entrained materials can even influence how coffee smells – altering its aroma profile.

Plus, organic contaminants in water can often lend an off-flavour to coffee. In particular, water with these types of solutes can produce coffee with a distinctive earthy or musty taste (geosmin).



BENEFITS OF A MAINS-FED WATER DISPENSER



Drinking water:

Potable water is one of the most highly controlled foodstuffs in the Western world. Excellent-quality H₂O is readily available from every tap – in whatever quantity desired, and at a highly attractive price. BRITA Ionox's mains-fed dispensers provide users with their very own supply of great-tasting water.



Cost-effective and long-lasting:

Mains-fed water dispensers save money compared to single-use bottled H₂O. Water from the tap is inexpensive; consequently, a dispenser typically pays for itself after just one year.



Eco-friendly:

Water dispensers connected to the mains cut out the CO₂ emissions, time and hassle associated with transporting, purchasing and storing bottled water. Moreover, they preserve precious resources, as, for example, no PET bottles have to be manufactured.



Healthy:

Simply put – drinking water is healthy. And just having a readily available supply of clean, delicious water encourages better hydration habits.

FILTER COMPONENTS



ion exchanger

[ˈɪən ɛkˈstʃeɪndʒə]

The ion exchange resin is made from a certified food grade material and, as its name suggests, selectively removes certain ions, such as calcium, from water.

These substances are then dissolved again and removed when the BRITA ion exchanger is recharged.

activated carbon

[ˈæktə,veɪtəd ˈkɑ:b(ə)n]

Activated carbon is a naturally occurring material. It has a high degree of microporosity and a huge internal surface area. As a consequence, activated carbon is able to efficiently absorb a broad spectrum of substances.

The pore size of activated carbon is generally larger than 0.2 µm, and its internal surface area can exceed 1000 m²/g (equivalent to four tennis courts).

The activated carbon used by BRITA is made from coconut shells.

particle filter

[ˈpɑ:tɪk(ə)l ˈfɪltə]

Particle filters typically remove particles from drinking water through mechanical, rather than chemical, means.

- Particulate matter is trapped on the surface of the filter
- Particulate matter is trapped within the filter fleece

SUMMARY

Water is more than simply H₂O. Depending on its original source and how it was treated, water can vary widely in its composition of dissolved minerals and hardness. BRITA filters help ensure consistently high-quality water – improving its taste as well as ensuring it has the ideal properties for its end use.

Goals of water filtration



Achieve the ideal mineral composition



Remove chlorine and particles



Reduce carbonate hardness



Lower maintenance and energy costs



Minimise machine downtime

YOUR SOURCE OF BETTER WATER.

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