

Water Filters Tipsheet 50p



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Are they a necessity or a luxury? It all depends on your situation – to find out what's best for you, read on...

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On the mains?

Mains drinking water quality in the UK is excellent, and if you are on the mains then the overwhelming likelihood is that your tap water is fit to drink. If you're worried about imbibing toxins then don't be; you would do better to concentrate your efforts not on extra filters but on avoiding unnecessary cosmetic, cleaning, and decorating products and breathing traffic fumes.

Mains water will have undergone an extensive range of treatment processes before it gets to your taps. EC and UK legislation sets out acceptable levels for contaminants such as aluminium, lead, nitrates, pesticides and disease causing organisms, which your water supplier will adhere to. That said, mains water may contain low levels of certain impurities that you consider unacceptable. If, for example, you would like to have water that doesn't taste of chlorine there are things you can do to improve matters – e.g. before investing in a filter try leaving water overnight in a covered jug in the fridge and any nasty niff of chlorine will disappear.

Private supply?

Of course, if yours is a private supply then you need to go back to basics and first find out what impurities – organic or inorganic – are in the raw water (just because it doesn't make you ill immediately, doesn't mean it isn't capable of doing you long term harm). It is worth remembering, however, that not all your water will need to be of drinking water quality, water for flushing toilets, the washing machine, and watering the garden need not be as clean.

Bearing these different situations in mind, here's a little bit more about what the problems are and what there is to be done about them.

Raw water impurities

Water supplies can be contaminated with a variety of substances from agri-chemicals to minerals and heavy metals, from naturally occurring bacteria to plant and animal remains. The range of contaminants can be split into two groups, organic and inorganic.

Not all impurities affect human health in the same way. Impurities of most immediate importance are biological (organic), not chemical (inorganic). Micro-biological contaminants can make you ill or even kill you in a very short period of time, whereas chemical contaminants impact on health generally in the long term. So make sure your water is biologically safe before worrying about chemicals. When it comes to chemicals in water, don't necessarily be alarmed, not all chemicals are



A range of filters are available (a) standard housing unit (b) cutaway version of a combined ceramic and carbon filter: the outer (white) region is ceramic and removes solids whilst the carbon core removes metals, pesticides etc. by adsorption (c) string filter (d) ceramic filter (e) carbon filter.

equally bad, and some are positively good for you when present in the right concentrations. The things to be concerned about are listed in the regulations. Be especially aware of carcinogens (like Benzene, and some pesticides) that have no safe intake level. It's worth remembering that chemical contaminants tend to make water unpalatable at concentrations that are deleterious to health.

Organic

Raw water is likely to contain substances such as microbes, plants and animals before it is treated. Some of these will be pathogens – that is, they are harmful to human health. Though bacterial growth is inhibited by the addition of chlorine, not all pathogens are killed and additional treatment may be required to prevent harm from parasites such as *Cryptosporidium* cysts (found on some farmland), *Giardia lamblia*, and viruses.

Other organic contaminants may not be so injurious to health, but will be aesthetically unpleasant: microscopic solids of plant and animal origin suspended in the water can cause coloration or taste/odour problems. On private supplies, if your water is otherwise unpolluted a simple sand filter may be sufficient to make the water safe to drink, though in the majority of cases it is recommended that you take the precaution of disinfecting the water after it has been filtered (typically using a UV filter, or by adding chlorine).

Inorganic

About 60 per cent of UK homes have hard water supplies, which is water containing a high level of calcium and magnesium compounds.

What filter(s) do I need...?

1. On a mains supply, don't bother on health grounds, only for taste and appearance. For private supplies, find out what your contaminants are by getting your water tested by your local Environmental Health Officer. You may need several tests throughout the year to get an accurate picture of biological contamination because it can vary from month to month.
2. Starting a treatment system from scratch? – consult 'The Water Book' by Judith Thornton (CAT Publications). Already got a fairly satisfactory system? – use the chart overleaf and the information provided by a water test to choose the most appropriate form of water treatment.
3. Contact a relevant professional and install your treatment system.

This will cause limescale when the water is heated, furring your kettle element and central heating pipes. This problem can be ameliorated by fitting a water softener. Soft water saves wear and tear on boilers, radiators and pipes, can help with skin problems such as eczema, and means that you will need to use less soap and detergent. There are many different types of softener available ranging in price from £50-400 at the time of writing. They generally work by running water through a vessel containing salt, where the sodium in the salt replaces the calcium and magnesium in the water. On the negative side, artificially softened water contains a lot of sodium which is linked to cardiovascular disease. If you install a water softener on your mains you must have a dedicated un-softened drinking water supply.

Potentially much more harmful are chemicals such as pesticides and nitrates from agricultural run-off. Despite the fact that water treatment plants eliminate a lot of chemicals, low levels may remain in tap water. It is also worth bearing in mind that new agri-chemicals and industrial pollutants are being released all the time which may not yet be tested for or treated. However, this type of pollution is a bigger potential problem for private water supplies, rather than mains water.

The treatment of mains water may in itself mean that tap water contains inorganic chemicals introduced as part of the treatment process. Chlorine, for example, is routinely added to eradicate harmful bacteria, but may also adversely affect the taste and smell of drinking water. Aluminium, which has been linked with Alzheimer's disease, is commonly used for the removal of solid particles from water (although you are far more likely to pick up aluminium from drinking tea than tap water). In the past, water pipes were commonly made of lead – a substance which may end up in your drinking water, particularly if your water is soft. Lead is thought to affect brain development and hence

you should check your pipes and get professional advice if they prove to be lead (pre-1960 buildings).

What filters do and how...

There are two opportunities for water treatment, either at the 'point of entry' or 'point of use'. Point of entry treatment systems treat water at or near to source. The treatment you choose will depend on the nature of your raw water. Point of use treatment systems are generally supplied off the shelf and generate small quantities of drinking quality water nearer the 'tap end' of the water supply system. Types range from the simple jug filter containing activated carbon to ceramic particulate filters and reverse osmosis units. Many filters use a standard filter housing unit that fits under the kitchen sink, and these are modular, allowing you simply to add other filters in series if required. Other filters combine several cleaning elements in one cartridge, for example ceramic filters may be impregnated with silver to kill bacteria. Check the table for a detailed breakdown of the filters that are available to deal with different impurities.

Further information

www.who.int/en – extensive information on water quality.

www.detox.co.uk – for Reverse Osmosis systems

www.britishwater.co.uk – for a series of factsheets

www.wras.co.uk – for a list of approved plumbers.

www.dwi.gov.uk – FAQs and UK drinking water quality data.

CAT also has a range of publications available on water saving and treatment. See www.cat.org.uk/catpubs for more details.

	KEY:						Principal aim of treatment	Secondary benefit
	Ceramic Filter	Activated Carbon	Sediment Filter	Dealk Resin	Ultra Violet	Reverse Osmosis	Water Softener	
Particles	■	■	■	■	■	■	■	
Aluminium	■	■	■	■	■	■	■	
Copper	■	■	■	■	■	■	■	
Lead	■	■	■	■	■	■	■	
Arsenic	■	■	■	■	■	■	■	
Hardness	■	■	■	■	■	■	■	
Nitrate	■	■	■	■	■	■	■	
Chlorine	■	■	■	■	■	■	■	
Pesticides	■	■	■	■	■	■	■	
Taste/Odour	■	■	■	■	■	■	■	
Bacteria	■	■	■	■	■	■	■	
Viruses	■	■	■	■	■	■	■	
Pros	Bacteria removal, cheap, cleanable. Fits in a standard cartridge filter.	Removes synthetic chemicals. Reduces false taste/odour. Fits in a standard cartridge filter or jug filter.	Good pre-treatment before other filters. Fits in a standard cartridge filter.	Removes poisonous heavy metals. Fits in a standard cartridge filter.	Kills bacteria and viruses. High filtration capacity.	Removes virtually all dissolved solids. Useful for specialist purpose water (e.g. photographic processing).	Prevents limescale. Improves detergent and soap efficiency. Low running costs.	
Cons	In our experience not 100% reliable against bacteria.	Ineffective against pathogens, requires frequent replacement. Stored water can become re-infected with bacteria.	Ongoing maintenance or frequent replacement required.	Water may need pre-treatment. Periodic replacement.	Constant electricity supply needed. Water may need pre-treatment. Doesn't remove pathogenic cysts. Requires periodic maintenance and replacement bulbs.	Not for drinking water; it removes minerals essential to health and wastes 30% of water. Expensive to run, energy intensive.	Elevates sodium levels so need an un-softened supply to drink. Not suitable for bottle fed babies. Sodium not good for garden irrigation.	