

Distilled water in coffee machines

(DaveC of Coffeetime) <http://myweb.tiscali.co.uk/coffeetime/index.htm>

This is a subject that has come up from time to time....I have always been concerned about what's in our drinking water and have personally believed many of the myths about distilled water thrown at me over the years. In fact for many years I wouldn't even drink the bottled stuff having once as a kid tried some demineralised water put through an ion exchange column (I wasn't aware of this and thought it was distilled). The disgusting experience stayed buried deep in my subconscious mind until I was in my late 20s when finally I was persuaded to try distilled water and found, of course, that it tasted great, nothing like what I had been given as a kid.

Tap water and coffee machines are not a great combination and I finally decided to splash out on a cheap distillation system, mainly by way of an experiment. Distilling water is not the cheapest method by far, but I wasn't about to fit a more expensive (and more hassle to fit) Reverse Osmosis system, until I was sure the machine would not object.

At the time of writing RO systems starting from around £90 are available on e-bay, although the quality of the cheapest may not be great. The difficulties of plumbing in wont suit everyone, mainly for reasons of space (the plumbing looks relatively easy).

I have considered using distilled water in coffee machines for some time, but been put off by the many postings on the Internet about how coffee machine auto fill controllers won't work properly with distilled water and that it is acidic by virtue of dissolved carbon dioxide, moving from a ph of 7 to a minimum ph of around 5.8 (this is very weakly acidic indeed). There is additionally the trouble of producing it and the cost, because it is not widely available in supermarkets. A number of events over the years have given me pause for thought. Espresso makers have a lot of little valves, o' rings and small components that move (solenoids etc...). Filtering water helps remove the calcium and magnesium that causes hardness (well just exchanges them for sodium), but there are many other things in our water that they don't effectively remove. These dissolved solids and volatiles manage to coat critical parts of our machines over time, resulting in problems, expensive repairs and the chore of regular descaling.

Some of the areas that problems can arise in are

1. One way valves in the pump line
2. OPV valves
3. Rotary Vane Pumps
4. 3 way solenoid valves
5. Auto fill valves
6. Vacuum breaker valves

The list goes on and all of these things are a real day-ruiner when you just want a cup of coffee. Simple scale faults can trigger much more expensive problems. I balanced the benefits against the very small dis-benefits of using distilled water and on balance the argument is in favour of distilled water.

Some of the arguments against distilled water are:

Arguments against distilled water	Comment
Your auto fill controller won't work	Well it does on Expobar machines and I fully expect it to on others. If it doesn't a few grains (literally) of salt in 3 litres will make it work just fine. It's not enough to hurt you and certainly not enough to taste.
Distilled water is acidic	Yes it can absorb carbon dioxide in an open container, however the rate does depend on the surface area exposed and the length of time. However it will only get to a maximum ph of 5.8 (but probably not as much as that) where a ph of 7 (actually a little less than 7) is neutral. Let's put that into perspective, about as acidic as milk. Certainly not going to do any harm to your coffee machine, especially when you consider your average descaler is a very much stronger acid and regular descaling will have a significantly greater impact due to acidity than use of distilled water. The ph scale is also a logarithmic scale, and there is approximately a 10 fold increase in acidity with each ph unit. So if distilled water is around 6 and descaler is around 1.5, descaler is about 50000 times more acidic!
Distilled water allows bacterial growth	Yes, eventually, but you won't have it around that long and because you won't need any in-line softening filter in your coffee machines water tank....no problem (no breeding ground). Possibly you will need to wash your cold water tank out every 3-4 days....but you should be doing that anyway.
Distilled water is expensive	Well in terms of tap water, yes. But not so much so when balanced against the cost of machine repairs, descaler cost and the time to descale. Plus the cost of water filter cartridges (2 per month to remain effective) and they don't remove that much! Distilled water costs approx 10p per litre. Its still more expensive of course, but without all the problems.
The coffee will taste worse	I'm not sure, possibly, possibly not. Certainly distilled water has a neutral taste, maybe more of the coffee will come out.

Really the most compelling argument is cost. It probably averages out only a maximum of £30 per year more expensive though, even when you factor in the cost of a distillation machine and an estimated 18month -2 year life span. It is of still better to get your hot water from a kettle, if you are using large amounts. It's a more suitable device than a coffee machine for providing large volumes of hot water

So finally I decided to try distilled water and so far I am totally happy with the results. **Ultimately it would be more economical to move to a reverse osmosis system that has a far higher capacity and is much cheaper per litre of water.**