

LIMESCALE IN DIM SUM STEAMERS

PROBLEM

- Most of England receives moderate to hard water (>8°Clark or >110ppm mg/L) that contains dissolved minerals.
- When this water is heated the minerals precipitate out and form layers of pink or yellowish white chalk rock and limestone on hot surfaces, called *limescale*.
- This rock layer reduces water flow in pipes and stops heat transfer in boiler tanks and heat exchangers.
- An unprotected and untreated dim sum steamer can fail in less than 1 year. Limescale causes overheating and material stresses that create leaks. The leaking heat exchanger is not repairable so expensive and lengthy heat exchanger replacement is needed.

POSSIBLE SOLUTIONS

- Drain water from the steamer whilst still warm after cooking, then refill with cold water. This will *slow* build-up but not stop it.
- Monthly descaling with a low pH chemical descaling agent will remove *some* build-up but it is often impractical to access the tank and physically scrape.
- Water “softened” via calcium treatment/filtration to fully prevent limescale; salt softening is not allowed because the water must be drinkable. Steamers use far more water than a vending/coffee machine or water heater so the treatment must be high capacity and regularly maintained to be effective.

COMPARISON

The below example is for London where water hardness is typically over 20°Clarke or 280 ppm mg/L and the steamer operates for 5 hours on 6 days each week, consuming 2400L water per month (20L/hr).

	No water softening	Daily draining and monthly chemical descale		Softened water (Brita Purity Steam 1200)	Reverse osmosis filtration (leased RO200)
Treatment capacity	n/a			6000 L @ 20°Clarke	250000 L or 32 L/hr
Space requirement	n/a			Ø300xH550. 24 kg.	W415xD200xH760 <i>plus</i> 40L storage tank Ø375xH490
Initial setup cost	0			£800 starter kit and meter	£150 pipework
Cost per month	0	£30 chemical descaler	£65 - £130	£60 filter (£120 filter lasts 2 mth)	£50 lease (3 year lease & service contract)
Staff time per month	0	6 hrs		¼ hr to replace filter (½ hr every 2 months)	0 (service by engineer annually)
Steamer life estimated	1½ years	3 years		5 years	7 years
Steamer replace price	£6000 (or £1670 for tank)	£6000		£6000	£6000
Average annual cost incl. purchase over above lifespan (excl gas, water & staff)	£4000	£2360		£2080	£1500
Important points	Steamer performance degrades rapidly, gas consumption increases.	Relies on staff remembering to drain tank each shift. Need to handle acidic descaling chemical.		Relies on staff changing filter every 2 months. Filter is heavy and can be messy to change.	Lots of space needed and electricity supply. Pump could fail. Water tastes unpleasant to drink.

FAR EAST STEAMER TANK REPLACEMENT

- Thanks to careful design of our CEST steamer Far East are able to offer tank replacement on all Far East steamers built since 2015.
- Other brands of dim sum steamer are frequently replaced entirely when the tank leaks because multi-tubular heat exchangers are not repairable; an expensive replacement must be bought and fitted, often requiring cutting the steamer apart and welding back together after! This is very expensive and can take days, often exceeding the value of the steamer, resulting in replacing the appliance.

PHOTOS

