Water vs. Steam

Test analysis comparison of disinfection effectiveness

The load

Glassware (different sizes and formats) contaminated with a soil.

The soil

Egg yolk enrichment: 1ml
Microbiological suspension: 1ml - E. Faecalis (ATCC 29212) - Population: 10^8 cfu
The test soil was dried on the glassware surface overnight at 55 °C (± 1)

The test

The glassware was treated in a **FLW washer-disinfector**.

Two different cycles were performed:
water-disinfection
steam-disinfection.

The washing phase was identical for both cycles.

Glassware positioned inside the FLW washer-disinfector

Cycle 1: washing + water-disinfection

Pre-washing phase at 30° C
Washing + alkaline detergent at 65 °C
Washing + acid detergent at 55 °C
2 Rinses at 30° C (to reach the same water conductivity value of inlet water)
Disinfection phase with water at 95 °C for 20 ’
Drying phase with compressed air and hot air injection in the chamber

Cycle 2: washing + steam-disinfection

Pre-washing phase at 30 °C
Washing + alkaline detergent at 65 °C
Washing + acid detergent at 55 °C
2 Rinses at 30 °C (to reach the same water conductivity value of inlet water)
Disinfection phase with steam injection at 100 °C for 20 ’
Drying phase with compressed air and hot air injection in the chamber

The cycle development activity was conducted by Fedegari. All the microbiological steps were executed by an external certificated laboratory. The lab received the samples treated for analysis and calculated the log reduction obtained.

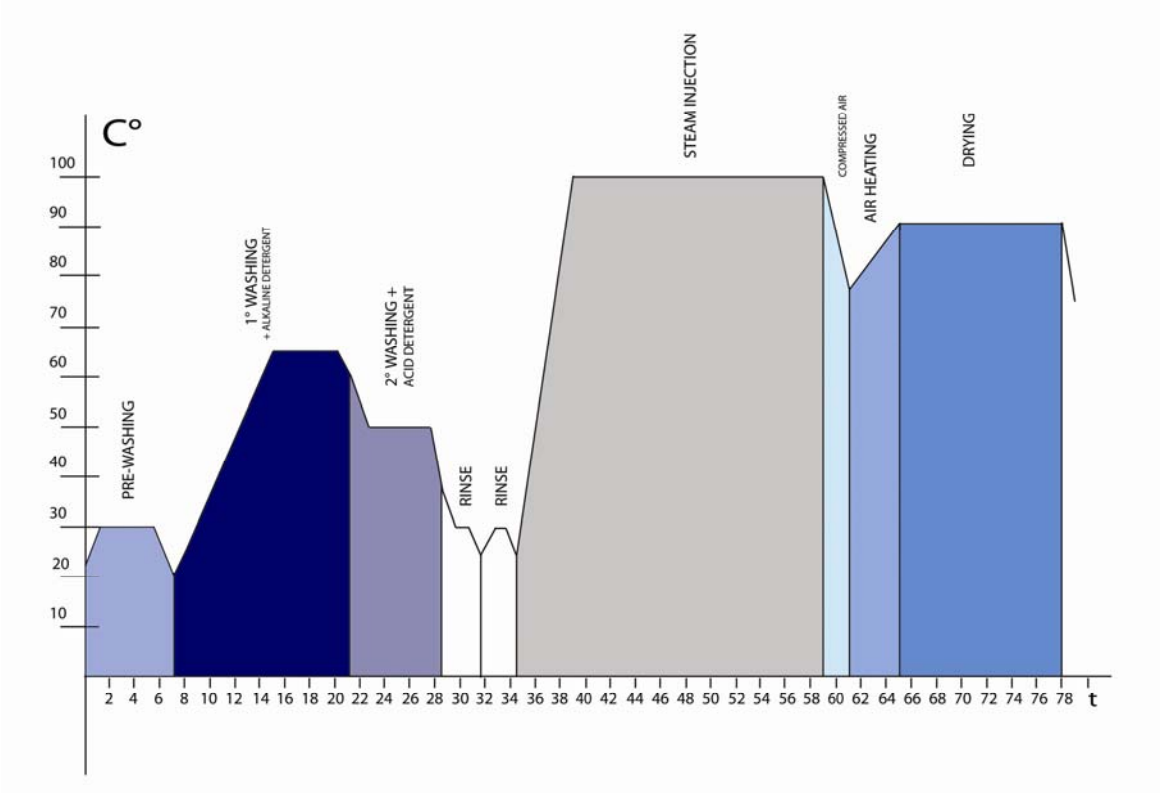
Results

Disinfection treatment	CFU Log reductions (average for 20 samples)
Water	3.9
Steam	**5.5**

Conclusion

Steam has proven to be more suitable for reducing microbial contamination and, thus, highly efficient for disinfection processes. It can be considered the most indicated treatment for obtaining higher log reductions.

Cycle: washing + water-disinfection



Notes:

For heat-sensitive loads a treatment at lower temperatures with water is more indicated.
The population inoculated was much higher than the normal microbial contamination found in the industry. The purpose of the trials was, in fact, creating the worst case scenario for evaluating the disinfection effectiveness.
The disinfection cycles were performed for 20 minutes (a longer time than a standard cycle exposure) for achieving a consistent microbial reduction.