

Cleaning methods, standards and HACCP

Controlling food safety hazards

Cleaning is the removal of unwanted matter. However in the food industry, cleaning is closely linked to sanitation as the same equipment needs to perform both tasks. We will discuss cleaning options in a separate info sheet. Now we would like to discuss the topic of sanitation and applicable standards.

One of the biggest misconceptions is that all too often, HACCP is referred to as a standard of cleaning. It is not.

HACCP is a systematic approach to the identification, evaluation, and control of food safety hazards.

It requires a...

- Plan which is a document based on HACCP principles
- System which is an implementation of a plan
- Team which is a group of people responsible for compliance



A very good reference point for food related principles is the WHO (world health organisation) collection of codes, guidelines and standards:

Codex Alimentarius.

In Codex's list of standards, you will see that HACCP is not mentioned as a standard. So how some people can say they conform to the HACCP standard is a mystery.

Codex Alimentarius has the following texts:

- Codex STAN followed by a number – this is a standard
- Codex GL followed by a number – this is a guideline
- Codex RCP followed by a number – this is a recommended code of practice

The HACCP plan can state methods and standards to which the cleaning and sanitation must comply or implements must comply.

There are a number of sanitising standards but often depend on industry and interpretation. Some include:

- DIN 10510:2013-10
- NSF-3-2012
- Food Standard AUSNZ 3.2.3
- AS/NZS-4187
- There are some industry based ones.
- CODEX Alimentarius that gives some international food standards and their CAC/GL21-1997 gives an idea on principles and guidelines

First and foremost dishwashing machines should clean and sanitize to an acceptable HACCP compliant level. The issue of a 82oC final rinse temperature is based on the measured temperature being 180oF (or 82oC) in the final rinse manifold as per NSF (National Sanitation Foundation) guidelines.

The actual temperature outside the manifold is not specified however, 70oC is generally accepted as the minimum temperature for sanitation. The final rinse alone will not achieve this, nor will it alone achieve the sanitation of items passing through.

In certain cases, one could add a chemical sanitizer to the final rinse which will allow for a drop in temperature.

Leaving cleaning aside for now, there are three main methods of mechanical dishwashing sanitation used in the world:

1. Chemical machines (often cold(er) water and sanitising chemicals only)
2. Hi-temp (very hot water and cleaning chemicals)
3. Contact Time (hot-water and cleaning chemicals)



The first system is mainly used in the U.S.A. for hospitality dishwashing and worldwide in industrial washing in areas where hot water is either not available or desirable (farms, fisheries etc). An inexpensive, yet unpleasant method, is to use strong chlorine bleaches, however, more and more QUATS (quaternary ammonium compounds) are being used. There are many varieties of quats available to suit individual sanitation requirements. Bleaches will quickly evaporate while quats have a better and longer sanitation efficacy.

QUATS are good for sanitation but not the best for cleaning that requires a high alkaline detergent.

The Hi-Temp technology, which is and has been the mainstay in U.S.A. and, sometimes Canada, runs on a continuous FLOOD of super-hot water and chemicals.

The USA refers to the regulations as set by the National Sanitation Foundation (NSF) in that vegetive pathogens are destroyed by long exposure to a temperature of 143oF (62oC). Using this as a base a dish exposed to 143oF for 1 second equals 1 Heat Unit Equivalent (HUE). At a temperature of 165oF (74oC) the HUE sum will be 346.8. Based on this, NSF have compiled a table with HUE's at different temperatures. It has been determined that a cumulative HUE of 3,600 is deemed to have sanitised the dishes.

To be able to transfer the calories required to obtain a high temperature requires a lot of water and energy. The final rinse on a machine uses hot, potable water – an expensive commodity.

That is the reason why Hi-temp machines need to flood the crockery, thus consuming more than 3 times of the amount of the water, and at least 4 times the amount of energy compared to a Contact Time method.



Last but not least, there is the Contact Time technology, which is the method used by most of the world. The Contact Time technology does not rely on chemicals only, nor on extreme

temperatures, but is a balance between the two, to achieve the best result with the lowest running costs and environmental impact. Final rinse water is not used for heat transfer alone, but to remove residual chemical and assist drying without negatively influencing the machine's operating temperature.



A detergent (chemical) is activated between 50° to 70°C during a longer wash process and at 85°C temperature in the boiler, items are rinsed to be perfectly sanitized (refer German DIN 10510). The rinse temperature alone DOES NOT sanitize the items. The idea of the contact time method final rinse is to remove residual chemicals from the items as these could have negative effects on both humans and environments. The chemical used is mostly an alkali based on sodium hypochlorite.

Contact Time method also allows for better activation of chemicals which means a wider variety of food produce can be cleaned.

Unfortunately there is confusion in the market due to the fact that although Australia has AS-4674 which refers to fitout of food premises. Item 4.1.6 refers to dishwasher/glasswasher sanitising

temperatures. The clause is ambiguous as it does not give any indication of time or temperature other than the combination shall be sufficient to sanitise the utensils. A reference is made to AS-2945 which is a standard for medical washer/disinfectors and the time/temperature relationship given relates to disinfection and not sanitising. In fact these given time/temperature ratios are not achievable in a standard commercial dishwasher.