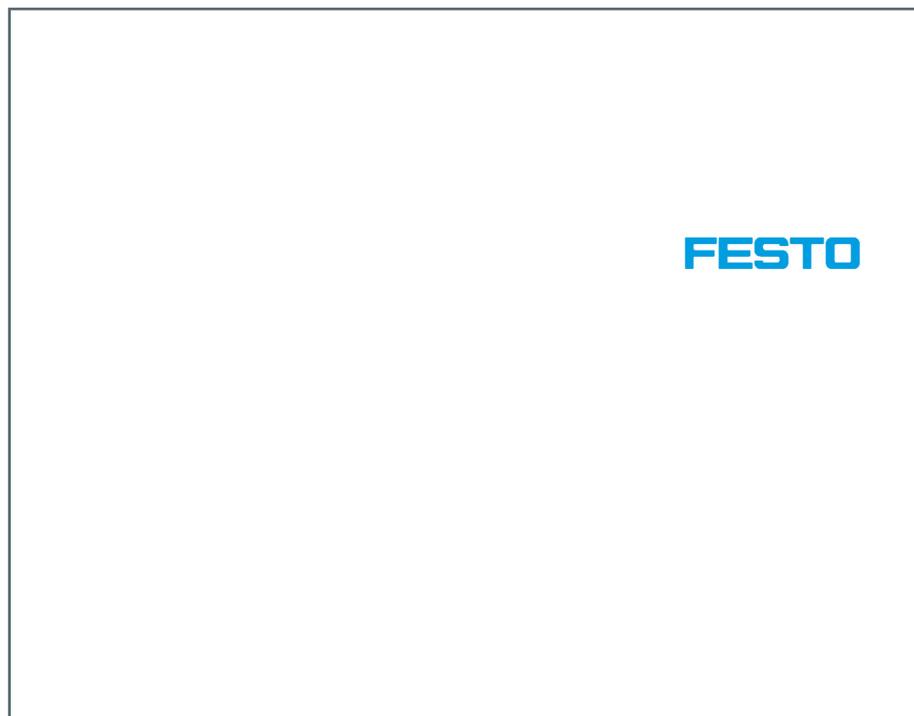


The challenge of cleaning – properly and safely!

FESTO

excerpt from:



Expert knowledge and solutions
for the food and beverage industry



The challenge of cleaning – properly and safely!



The topic of industrial food production is particularly important in industrial food production. Hence it is essential in the area of hygienic food production that every manufacturer take responsibility for its products.

Flawless product safety – especially from a microbiological standpoint – is of the essence in order to protect the consumer. Top priority is accorded to preventing the spread of germs and eliminating foreign particles. Proper cleaning helps to protect your customers and your brand.

Optimum, appropriate cleaning saves time and money.

The primary influencing factors are:

Temperature	Time
Mechanics/force	Concentration

The correct selection of components for safe operation and optimum cleaning:

Only seals and lubricants approved for use (e.g. FDA) with food are to be used for operation in contact with food. Depending on the requirements of the specific application, there is a choice of valve types either for normal cleaning or for applications using intensive foam cleaning.

Intensive cleaning of machine parts can also wash out the lubricating grease and impair the effectiveness of the components. Using unlubricated seals ensures that the washed out machine components still function reliably.

Different types of cleaning agents are used depending on the areas/surfaces to be cleaned. Gel, foam or liquid cleaning agents adhere to surfaces in varying degrees and should thus be applied differently. This results in the different necessary cleaning processes.

The cleaning process

Dry cleaning

Dry cleaning is generally used to remove any loose or easy to remove dirt. Depending on the type of contamination, dry cleaning is usually followed by wet cleaning.

Dry cleaning is restricted to

- Sweeping brushes
- Dry wipes
- Brushes
- Suction

High pressure cleaning

Procedure:

1. Preparation (manually remove coarse contamination)
2. Pre-cleaning with water (with-out/reduced pressure)
3. Main cleaning with cleaning agent
4. Application time (if specified by the cleaning agent)
5. Rinsing with water
6. Visual inspection/test strips

Low-pressure foaming method

Procedure:

1. Preparation (manually remove coarse contamination)
2. Pre-cleaning with water (with-out/reduced pressure)
3. Main cleaning with cleaning agent
4. Application time (if specified by the cleaning agent)
5. Rinsing with water
6. Visual inspection/test strips

Special cleaning processes

In order to clean system parts outside and inside in accordance with the hygiene regulations, additional special methods must be used:

- Flush through
- Spraying
- Filling
- Scraping

Cleaning processes

The above-mentioned cleaning methods can be used for different cleaning processes.

→ Please note:

CIP is frequently also called cleaning in process. According to the definition by the EHEDG, however, it is actually cleaning in place, i.e. the parts and components are cleaned in their installed position as opposed to during the actual process.

CIP – Cleaning in Place

An automatic process ensures complete cleaning/disinfection. The system parts and components need not be disassembled for cleaning. This takes place in accordance with a specific procedure that has been stipulated by the manufacturer.

COP (Cleaning Out of Place)

System parts and/or components are disassembled for cleaning. Manual and automatic (e.g. washing machine) cleaning can be used here.

SIP (Sterilisation In Place)

An automatic process sterilises the designated areas completely. The system parts and components need not be disassembled for sterilisation. This takes place in accordance with a specific procedure that has been stipulated by the manufacturer.

SOP (Sterilisation Out of Place)

System parts and/or components are disassembled for sterilisation. Manual and automatic (e.g. washing machine) sterilisation can be used here.

Cleaning and disinfecting agents

The basic characteristics of cleaning agents

From: DIN 10516

There are differences between the various cleaning agents that are suitable for use in the food zone. However, several basic characteristics are imperative in order to ensure the effectiveness of the cleaning agent on a day-to-day basis.

- Quick, complete solubility in water

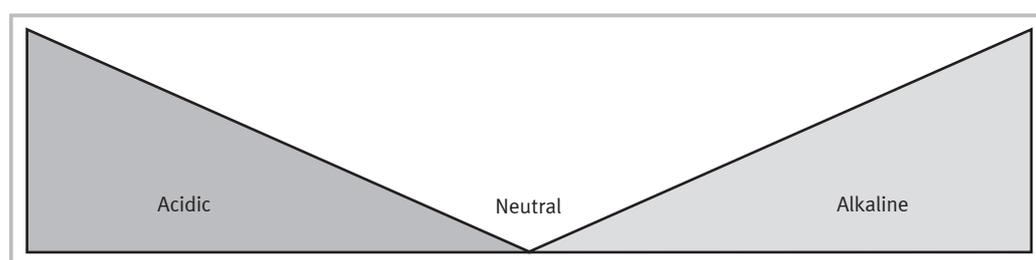
- Equally good wettability of all surface materials to be cleaned
- Fast soaking and removal of food residues or their main ingredients (i.e. fats, proteins, carbohydrates, yeast, fruit flesh, etc.)
- Absence of foaming or antifoaming power
- Compatibility with surfaces to be cleaned without causing corrosion

- Good rinsability
 - Environmental compatibility
 - No risk for personnel
- No single chemical demonstrates all of these characteristics. This means that a combination of chemicals is required within which each substance performs a predefined task as part of a complex cleaning process.

Selecting a cleaning agent

The appropriate cleaning agent is selected based on the type of contamination, the corrosion resistance of the parts and components to be cleaned and the cleaning and/or disinfecting process.

- Acidic cleaning agents
- Neutral cleaning agents
- Alkaline cleaning agents
- Disinfectants



Range of applications for cleaning and disinfecting substances

Lyes	E.g. caustic soda for removing organic substances
Acids	E.g. phosphoric acid, nitric acid for removing inorganic constituents and salts
Surfactants (tensides)	Tensides are used to lower the surface tension of water. They also penetrate and emulsify contaminants (fats, proteins, etc.).
Per compounds	Oxygen-hydrolysing compounds (oxidants) such as hydrogen peroxide and peracetic acid. Fast-acting and very aggressive.
Active chlorine compounds	Oxidants, preferably only to be used at temperatures up to 70 °C (DIN 11 483).
Alcohol compounds	Ideal as a fast-acting disinfectant and surface disinfectant.
Quaternary ammonium compounds (QAC/tensides)	Strong surface activity for good wetting and material compatibility

Evaluation of effectiveness of cleaning and disinfecting substances

	Lyes	Acids	Oxidants	Tensides
Proteins	+++	+	*	+
Grease	+	–	*	+++
Low-molecular carbohydrates	+++	+++	0	0
High-molecular carbohydrates	+	+	++	*
Salts	–	++	0	0

+++ : Very good; ++ : Good; + : Suitable; * : In specific cases; – : Unsuitable; 0 : Not necessary