

Conveyor Belting Cleaning Recommendations

How to clean belts?

We recommend that you keep your belts' adhesive qualities intact by cleaning and conditioning belts when necessary.

A clean belt will properly offer the friction qualities it should.

Cleaning Agents

- **Soap and water:** For all belt types; Nylon belts should be dried after washing
- **Alcohol:** Spot cleaning on all belts
- **Alkalis** (low concentration): Not for use on EPDM rubber
- **Ammonia:** Not for use on NBR, EPDM or Silicone
- **Borax:** Good for all belting
- **Chlorine:** Do not use
- **Kerosene:** Not for use on PVC or EPDM covers
- **Live Steam:** Not for use on Nylon belts
- **Household cleaners:** Many are useful, check formulation and perform a spot test
- **Quaternary Ammonia:** Useful for cleaning/sanitizing food conveyor belts

Please note: Combinations of agents may cause unpredictable damage.

Practice – Cleaning and Disinfecting

Hygienic design of machinery, equipment and conveyor belts is the basis for safe food production. However, in the food industry this is not sufficient by itself. Manufacturers can only ensure that their products are reliably protected against pollution and contamination by regular and proper cleaning. Successful cleaning requires that the four main factors in the cleaning process are combined correctly:

- Mechanical/kinetic energy (cleaning method)
- Chemical energy (cleaning and disinfecting agent)
- Temperature
- Time

Cleaning methods in the food industry

A number of different cleaning methods are available in practice depending upon industrial sector, degree of contamination and level of equipment. Table below shows a survey of frequently used methods and average cleaning temperatures:

Method	COP * cleaning/disinfecting		CIP * cleaning/disinfecting
	Manual	Semi-automatic	Fully automatic
	<ul style="list-style-type: none"> · sweeping · scraping · brushing · scrubbing · rinsing (hose) · wiping · vacuuming · dipping 	<ul style="list-style-type: none"> · vacuuming · spraying · brushing + spraying · dry vacuuming · rinsing, spraying · lathering, spraying 	<ul style="list-style-type: none"> · treatment in washing, rinsing and ultrasound machines · CIP (tanks, containers, pipes, etc.)
Temperature	up to 40 ° C/104 ° F	up to 60 ° C/140 ° F	up to 80 ° C/176 ° F

* CIP (Cleaning in Place), cleaning sealed systems

* COP (Cleaning on Place), surface cleaning (walls/ceilings/floors/conveyor belts/machinery, etc.)

When using the individual methods, please note the following points:

- The use of brushes and cloths involves considerable hygiene risk (cross-contamination).
- Subsequent spraying with or dipping in disinfectant is recommended.
- The success of manual cleaning largely depends upon the subjective capabilities and care of the staff.
- Unlike CIP cleaning, in COP cleaning, cleaning equipment should be made available and the solutions manually prepared.

One method frequently used in practice to clean conveyor belts, especially in meat and fish processing, is foam cleaning or TFC cleaning (TFC = optimised foam cleaning).

Practice – Cleaning and Disinfection

Cleaning agents

In the food industry, cleaning agents are selected on the basis of the type of soiling, corrosion resistance, parts or components being cleaned and the cleaning or disinfecting method. They may possess the following basic qualities:

- Completely and rapidly water soluble
- Wet all surfaces and materials to be cleaned well (not always necessary)
- Soak quickly and remove food residues (e.g. fats, proteins, carbohydrates, yeast, fruit pulp, etc.)
- Surface/material compatible
- Rinse off well

One single chemical does not usually possess all the qualities required. Consequently, in practice, combinations are used resulting in the following typical cleaning agents:

- Acid cleaners
- Neutral cleaners
- Alkaline cleaning agents
- Disinfectants

Examples of typical cleaning and disinfecting substances:

Acid cleaning agents	<ul style="list-style-type: none"> · Inorganic acids, e.g. phosphoric acid, nitric acid · Organic acids, e.g. acetic acid, citric acid · Solvents · Surfactants · Inhibitors
Neutral cleaning agents	<ul style="list-style-type: none"> · Phosphates · Surfactants · Peroxides · Complexing agents · Solvents
Alkaline cleaning agents	<ul style="list-style-type: none"> · Surfactants · Caustic soda solution/potash lye · Soda · Hypochlorites · Complexing agents
Disinfectants	<ul style="list-style-type: none"> · Peroxides · Peracetic acid · Quarternary ammonium compounds (QAV) · Hypochlorites · Aldehydes · Biguanides · Amphoterics · Alcohol · Chlorinedioxide ClO₂

Disinfectants reach a very wide range of microorganisms, resistances of microbes do not occur. However, depending on the active matter some disinfectants do not kill specific germs (e. g. most of the surfactant

based disinfectants avoid mould formation but are not suitable to kill high quantities of present mould). A change of the disinfectant makes sense if a micro species from an exterior source, which could not successfully be killed by the present disinfectant, enters the production plant. Frequently alkaline cleaning is used in the food processing environment because most of the present deposits are based on organic material. A sporadic acid cleaning is recommended to remove inorganic stains (e. g. water hardness deposits). However, areas being cleaned should always be rinsed thoroughly with water in between. (Example W-A-W-S-W-D-W). (W = rinsing with water; A = alkaline cleaning; S = acid cleaning; D = disinfecting)

Practice - Cleaning and Disinfection

Action of cleaning agents and disinfectants

Agent	Action
Alkalis	Remove organic substances such as carbohydrates, fat and protein deposits.
Acids	Remove inorganic constituents (salts, calcium, lime-scale, beer stone, tartar, milk stone deposits).
Surface-active substances (surfactants)	Relieve surface tension of water. Penetrate and emulsify contaminants (e.g. fats, proteins, etc.)
Neutral cleaners	All-purpose cleaners with good cleaning action can be used on virtually any material (good fat and protein solvency).
Per compounds peracetic acid)	Oxygen-releasing compounds (oxidants) which act quickly. (Hydrogen peroxide) Suitable for chlorine-free disinfecting.
Active chlorine preparations	Primary potent disinfectants as well as for bleaching
Chlorinated alkaline compounds	Used to remove tenacious organic deposits such as protein- or carbohydrate-layer as well as bleaching.
Alcohol preparations	Fast-acting spray and surface disinfectants (destroying bacteria and other microorganisms) are particularly suitable for surfaces susceptible to corrosion because they dry quickly.

The table below contains a summary of the efficiency of cleaning agent components with different types of soiling.

Contamination	Cleaning agent base		Other components	
	alkalis	acids	oxidants	surfactants
Protein and protein deposits	very good	good	in special cases	suitable
Oils and Fats	suitable	not suitable	in special cases	very good
Low-molecular carbohydrates	very good	very good	not necessary	not necessary
High-molecular carbohydrates	suitable	not necessary	good	in special cases
Salts and minerals	not suitable	very good	not necessary	not necessary

Practice - Cleaning Conveyor Belts - Examples

Cleaning conveyor belts - examples

The following two cleaning methods are used in most areas of the food industry to clean machinery and conveyor belts. Certain parameters may vary depending upon industrial sector, severity of contamination and the material of the surface being cleaned.

- Cleaning temperature
- Contact time
- Cleaning agent
- Mechanical forces
- Disinfecting

General recommendation for cleaning conveyor belts

We recommend the following steps for cleaning conveyor belts:

- 1. Preparation** - switch off electric etc.
- 2. Gross solid removal**
- 3. Pre-rinsing**

With pre-rinsing, coarse dirt is rinsed off or detached with warm water (up to 60° C) at low (max. 25 bar) pressure (high pressure causes increased aerosol formation -> recontamination, moreover, material exposed to high pressure is subject to excessive stress).

- 4. Cleaning**

At the actual main cleaning stage, stubborn dirt on the belt (e.g. oils and fats) is dissolved with the aid of chemical cleaning agents. Cleaning agents are generally applied as foam. In practice, however, under certain circumstances the belt is also scrubbed manually.

- 5. Rinsing off**

In this stage, dirt previously detached or dissolved is rinsed off the belt with the aid of warm water (up to 60 ° C/140 ° F) and low pressure.

It is particularly important not to set the water pressure too high so that when rinsing off the conveyor belt neighbouring machinery, plant components, walls or floors are not contaminated again by splashes of material which has just been washed off (cross contamination).

- 6. Check cleaning result**

Check all critical areas, e. g. visually or by ATP-measurement. Re-clean if necessary.

- 7. Disinfecting**

Disinfection is recommended in all hygiene relevant areas of a food processing plant such as production equipment, conveyor belts, packaging machines, facilities, floors, walls and all areas identified within the existing HACCP-system. It should always be taken into consideration that also surfaces without direct food contact could cause hygiene risks in regard to cross- contamination. Moreover, the conveyor belt must not be affected by cleaning agents and disinfectants.

Therefore, note should be taken of the chemical resistance of the plastic, the directions for use and the dosage instructions of the chemicals used.

- 8. Final rinsing off with POTABLE water**

After cleaning, and if required, the conveyor belt is rinsed off with potable water using low pressure. (All residues from cleaning agents or disinfectants should be removed from the belt before it is used again.)

- 9. Check**

Disinfection result is checked using the appropriate method for the particular industrial sector (e. g. microbiological method: swab, contact plate).

Cleaning

It is important that all parts of the installation that come into contact with the belt are kept as clean as possible.

Oil, grease, moisture, rust, dirt, traces of conveyed products, etc. on pulleys, rollers, slider bed and other

parts of the installation in contact with the belt may cause operational and belt performance problems and will

certainly shorten belt service life.

The importance of belt cleanliness with regard to drive, proper tracking response and belt life cannot be overemphasized. Dirt on the conveying side of the belt may also lead to process breakdowns. Obviously hygiene is of particular significance in the food sector where a number of special cleaning measures must be

implemented.

Listed below a few general points on the cleaning of synthetic conveyor belts:

- Cleaning should, wherever and whenever possible, be carried out when the installation is at rest (safety aspect)
- In the case of light dirt deposits (dust, etc.), clean with a soft cloth; dry or moistened with cold or warm water
- Oily, greasy soiling can be removed with hot water and a general, non-abrasive household detergent (low foaming types can aid the rinsing process)
- Spot cleaning can be performed via a damp rag application of a suitable solvent (see table)
- Heavy soiling can be removed by scrubbing with hot soapy water or washing with a mild solvent (see table)

Maintenance and Cleaning

- **Unsuitable** solvents are:
 - Aromatic compounds (benzene, toluene, xylene)
 - Chlorinated hydrocarbons (trichloroethylene, tetrachloroethylene, tetrachlorohydrogen)
 - Ketones (acetone, methylethyl ketone)
- When working with flammable and/or noxious chemicals, it is vital for you to observe all applicable safety precautions (refer to the corresponding safety data sheets for the chemicals to be employed).
- When cleaning with hot water or steam, take care not to exceed the maximum permitted temperature for the belt
Caution: Inappropriate cleaning with high-pressure cleaning apparatus may damage the belt
- The belt should be dried after being cleaned with water
- Do not immerse belts in water or other fluids for long periods. This can result in irreversible dimensional changes (shrinkage), camber, color changes, degradation of the materials, layer separation or premature splice failure, etc.
- Where brushes are used for cleaning, use only those with soft bristles