WHITEPAPER

WALTHER TROWAL

CUTLERY CLEANING

Cleaning of cutlery – at a fraction of the current costs

Absolutely clean, polished to a high gloss and germ-free – that is how the cutlery should be, when it is presented to the guests.

The airplane that has just landed, the truck of an event caterer returning from a large happening, or the cutlery container arriving after lunch was served in a hospital: These events have one thing in common, namely that large quantities of soiled cutlery must be quickly cleaned so that it can be used again. This task can be perfectly handled with the BRA equipment – the cutlery cleaning systems from Walther Trowal. They clean the cutlery fully automatically. Several thousand pieces are leaving the machine absolutely clean, dry and free of water spots and germs.

“Trowalizing” – functional principle

The basis for this astonishing cutlery cleaning system is the “trowalizing” process. Walther Trowal, for more than 90 years specialized in the field of surface refinement, initially developed this technology for surface grinding and polishing of precision components made from metal. The “trowalizing” method applies a high gloss polish to high-end automotive wheels, turbine blades and even orthopedic implants such as artificial knees and hips.

The cleaning effect on the cutlery is generated in the vibrating processing bowl. This induces an intensive, yet gentle, rubbing effect between the processing media and the cutlery pieces. The process is supported by the injection of special detergents.

Trowal cutlery cleaning machine

A completely different cutlery cleaning system:

Perfect results with minimal utilization of valuable resources

To date, the cleaning of soiled cutlery, especially in case of dried-on food residues, was rather difficult and costly requiring a lot of time and personnel for pre-sorting, pre-rinsing or time-consuming soaking, polishing and drying. Frequently, the cutlery had to be transported from one location to another. Because the finished cutlery pieces were seldom completely dry and free of spots, there were additional expenses for quality control and rework.

Difficult-to-handle lime or corrosion spots also had to be removed. To produce completely clean cutlery multiple rinse stages were required, consuming large amounts of hot water. Moreover, the energy consumption for the drying process with hot air was very high. All this was extremely costly, especially when thousands of single cutlery pieces had to be handled per hour.

With its BRA cutlery cleaning systems Walther Trowal took a completely different, more cost-efficient approach. The Trowal equipment uses fewer chemicals and less water with a significantly lower temperature. But it achieves perfect cleaning results in shorter cycle times.

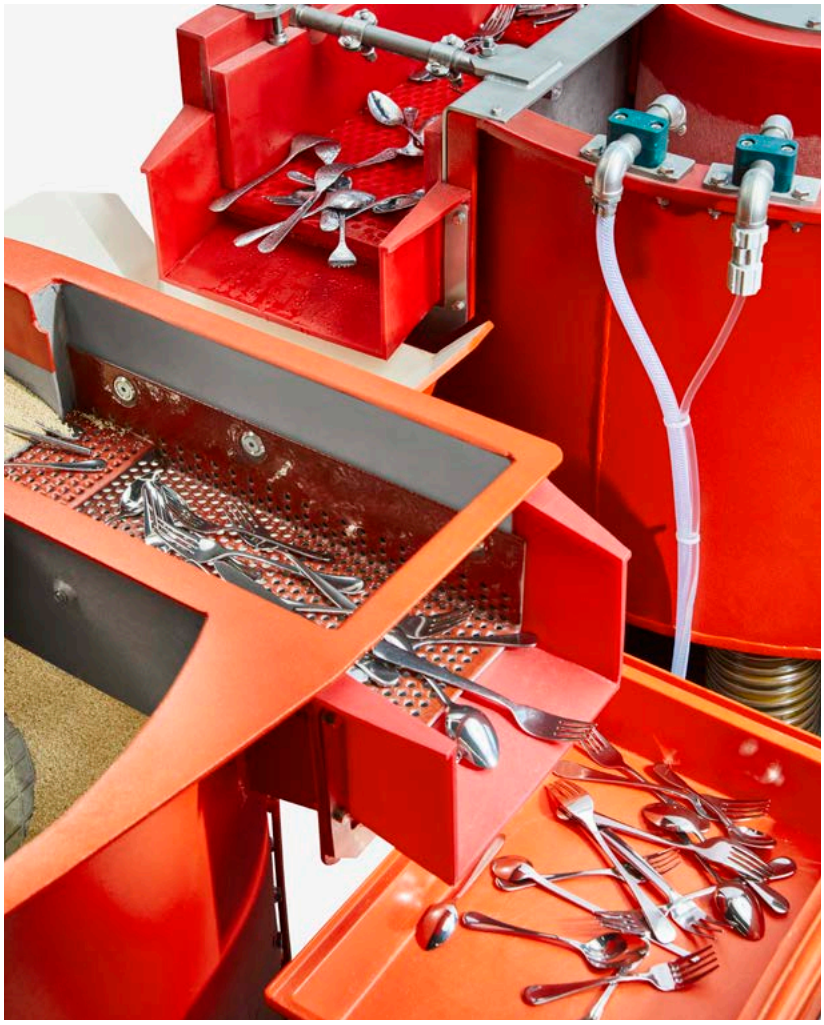
The innovative solution

Shiny results with the HDS technology

The “Sinner” circular diagram describes four key parameters that determine the success of a cutlery cleaning operation (page 10), namely chemical cleaning agents, mechanical action, temperature and processing time.

The success of the cleaning operation depends to a large extent on the interaction of these four parameters. But the sum of all parameters always amounts to 100%. For example, if no warm water is available, the parameters time and mechanical movement become more important. This means that the rinsing phase lasts longer, and the pressure of the processing medium must be increased. If a cutlery piece is exposed to the processing medium for a shorter time period, more detergent and a higher temperature are required. There is a practically infinite number of possible combinations.

Transfer of the cutlery pieces from the processing bowl into the drier.



Typical applications

The HDS technology stands for cleaning cutlery at extremely low costs, minimal expenses for labor and sparkling clean results. Walther Trowal offers the cutlery cleaning systems in three sizes as model BRA 900, BRA 1200 and BRA 2500. Depending on the machine size, a volume of 1,250 to 5,000 cutlery pieces can be handled per hour.

More than 200 machines are currently in operation at airline caterers, event agencies and hospitals.

Airline caterers

When an airplane lands at its destination after a long trip, many hours have passed since the first meal was served. During this time gravy and food residue are usually baked onto the cutlery pieces.

For example, at the airport in Zurich the company Gate Gourmet works for more than 50 airlines. There a Walther Trowal BRA 2500 cutlery cleaning machine, handled by one operator, cleans, polishes and dries up to 70,000 thousand cutlery pieces per day. With this system Gate Gourmet was able to cut the costs for cutlery cleaning by two thirds. Similar results are achieved with the same equipment at Toronto airport. The EverGreen Skycatering company at Taipei airport has achieved a significant cost reduction and could drastically lower the reject rate.

Non-Food-Caterer

The same positive results are reported by the general manager of the non-food caterer PERFECT Event Organizing Service: „On Monday morning, after a busy event weekend, we receive thousands of soiled cutlery pieces that must be ready for the next happening. Since we have been processing our soiled cutlery in the cutlery cleaning machine, they are sparkling clean in a very short time…. and at the same time we save a lot of money. This applies not only to the operating costs, but the number of cutlery pieces in circulation could also be significantly reduced." The budget of the catering companies is also improved in other ways: They need less cutlery! And the gentle cleaning process extends the usable life of the cutlery pieces severalfold so that fewer replacements must be purchased.

Hospitals

In hospitals the BRA systems produce not only sparkling clean cutlery pieces, but the drying temperature of up to 70 °C makes the cutlery germ-free. The cleaned and dried cutlery significantly exceeds the hygienic requirements for industrial cutlery cleaning per DIN standard 10510:2008-06.

Particularly after the experience with the 2020 pandemic the demands for cleanliness and sterility of cutlery have become significantly stricter. At the same time, during a period of stricter environmental requirements the volume of garbage must be decreased. This means that fewer one-way cutlery pieces made from plastic, wood and bamboo can be used. For this reason significantly more stainless steel cutlery is being utilized.

The BRA system resolves both problems. On the one hand, in compliance with the strictest hygiene demands, the cutlery leaves the machine absolutely clean and germ-free. On the other hand, the cutlery pieces are not thrown away but remain in circulation. This represents a prime example for sustainability!

Proof for this claim is the hospital in Graubünden/Chur, Switzerland, which since 2020 has been using a Trowal BRA 900 with great success.

Economic considerations

The costs for mechanical motion are lower than those for heating energy.

With the "HDS technology" (hydromechanical three-stage process) we lower the share of the expensive parameters chemical cleaning agents, temperature and labor in favor of the intensive but gentle rubbing action between cutlery pieces and processing medium consisting of polishing media and process water.

Our experience proofs convincingly that "Trowalizing" quickly pays for itself. The cleaning equipment is frequently amortized within just a few months. This is mainly due to the fact that the usage of electricity, water and detergent is reduced by up to 70%.

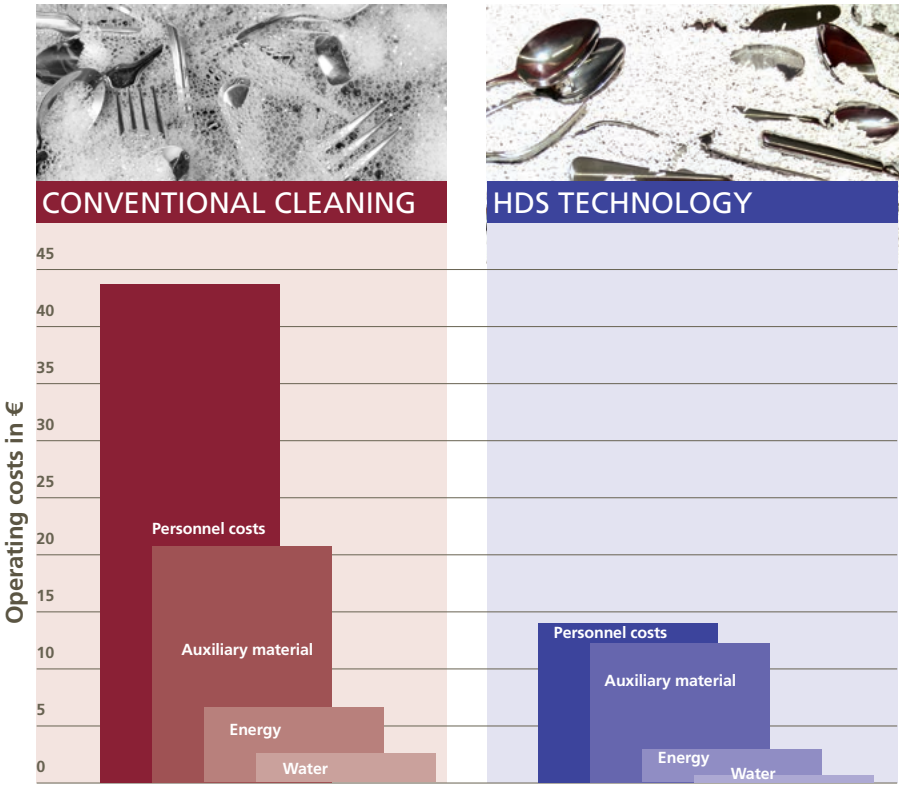
Moreover, with the Trowal cutlery cleaning machine the labor costs can be drastically reduced. One user reports that his labor costs are 20% lower. And the amount of rework is practically zero. With the previous cutlery cleaning system about 50 to 100 kg of cutlery had to be cleaned a second time. With the BRA system the amount of rework is less than 500 g.

Altogether the BRA system lowers the costs for cutlery cleaning by about 30%.

THE RESULT:

The consumption of detergent and water is significantly lower. The same applies to the costs for energy, for the rinse water must not be heated. During the cleaning cycle electrical energy is only needed to power a vibratory motor.

Operating costs for 2,500 cutlery sets



THE HDS TECHNOLOGY – HOW IT WORKS

A cutlery cleaning system consists of a cleaning/rinse machine and a drier. The cleaned cutlery pieces are automatically transferred from the cleaning/rinse unit to the drier. All the operator has to do – before the polished and dried cutlery pieces are removed – is to optically monitor the process and activate a separation flap.

The soiled pieces – cutlery but also ladles and serving tongs – are randomly placed into the vibrating processing bowl containing porcelain polishing media that was specifically developed for cutlery cleaning. The porcelain media pieces are a bit smaller than rice grains. Because of this small size the media reaches all surface areas of the cutlery pieces, even tight corners. At the same time the media does not lodge between the tines of forks.

The entire operation, surface cleaning, rinsing and spot-free drying , takes place fully automatically. Time-consuming and labor-intensive pre-soaking or pre-cleaning, as well as costly post-polishing are no longer necessary.

Even difficult-to-remove food residues and flash rust are consistently removed by the BRA system. The HDS technology also removes oxide from silver cutlery so that elaborate manual polishing of the silver is no longer necessary. At the same time the metal is protected against short-term oxidation and discoloration.

The rinse phase of the cutlery cleaning process

THE RESULT:
Shiny cutlery produces happy customers.

Perfect results

Cleaning and rinsing phase – intensive but gentle

The spiral motion in the vibrating processing bowl causes the cutlery pieces and polishing media to continuously rub against each other, thus producing the desired cleaning effect. The cleaning time and vibratory intensity are variable and can be individually adjusted to the amount of food residues on the cutlery pieces. This ensures that the cutlery is perfectly clean and slightly polished. Even food residues baked into the cutlery surface and flash rust are consistently removed in one single cleaning cycle. Pre-soaking and pre-cleaning are a thing of the past!

The detergent Trowaclean BRS 20 was specifically developed for use with tap water. The costs for heating the water are eliminated.

After the cleaning cycle the cutlery pieces are separated from the porcelain media, rinsed with clear water and discharged from the processing bowl. The cutlery is now perfectly clean and sanitized.

Drying operation – spot- and germ-free results

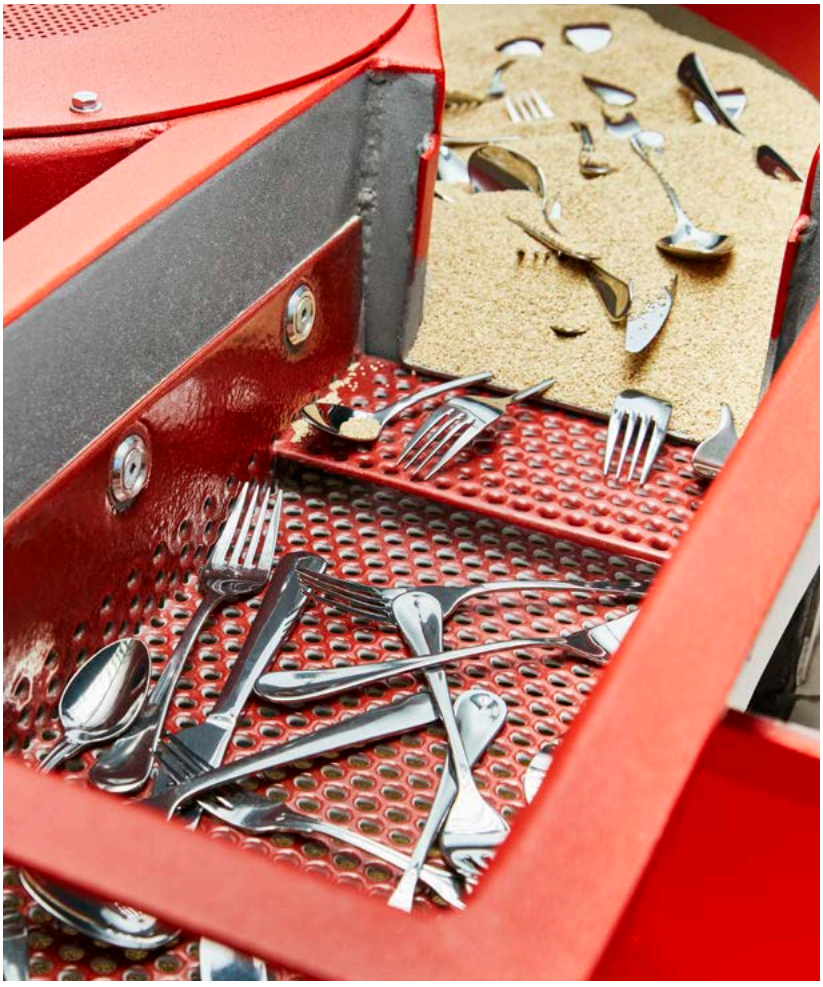
The cleaned cutlery pieces are directly transferred from the processing bowl into the downstream drier. The special drying media GTM-300 is heated to a temperature of over 65 °C and is, thus, free of germs. The drying operation is extremely gentle and produces absolutely spot-free surfaces. The drying media completely absorbs the residual water. And because of the high temperature the water evaporates quickly. The drying media generates very little dust

and is pre-treated for sterilization (DIN EN 1174, laboratory number 23036M068).

Because the granules have a precisely defined size, no drying media gets lodged between the tines of forks. The vibrating media also produces a light polishing effect.

The dried cutlery is free of spots and shiny, Therefore, it requires no additional polishing operation. The cutlery pieces are discharged from the drier with a chute and gently slide into baskets or a conveyor belt for sorting.

The driers are an integral part of the BRA systems. But they can also be operated as stand-alone units. In this case the wet cutlery pieces are directly dumped from the dishwasher baskets into the drier. They must not be placed individually into the drier as required in conventional drying systems.



The cutlery drying phase

Sanitary conditions – germ-free cutlery

The food residues carried into the machine with the cutlery pieces are pulverized by the porcelain media and, together with the detergent and water, completely discharged from the machine as an emulsion. After the cleaning process the cutlery is free of germs and has a shiny surface. It can be immediately re-used without requiring any additional post-treatment.

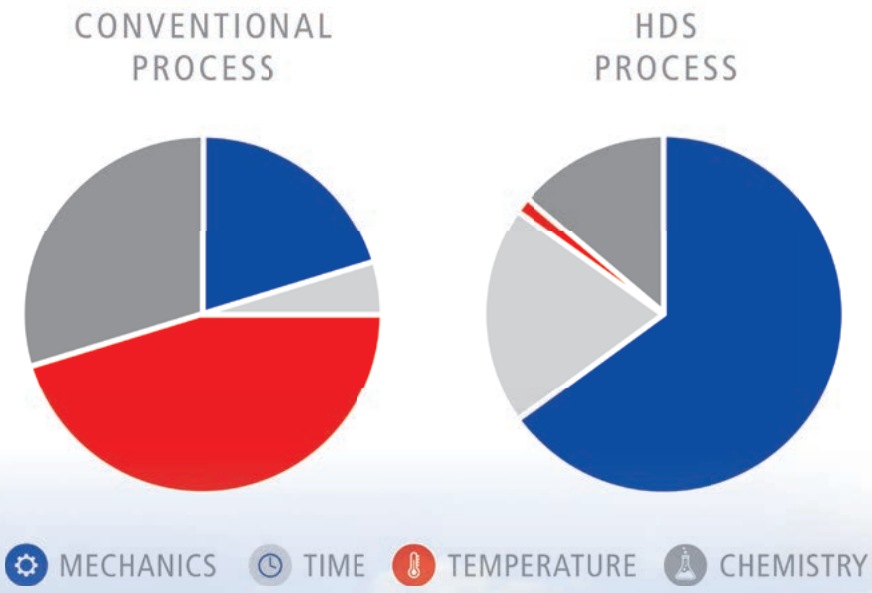
For the drying process the maizorb drying medium, already delivered germ-free, is heated to at least 65 °C . This kills any germs carried into the drier as confirmed in a technical expertise by the hygiene institute GfPS in Aachen, Germany.

Forks polished and unpolished

Silver knifes polished and unpolished

Trowalizing – good for the environment and the wallet!

The “trowalizing” technology also protects the environment: The vibratory process reduces the consumption of detergent and water. In addition, the rinsing operation takes place at ambient temperature. And the drying media consists of maizorb, a material that grows naturally.



The basis – The “Sinner” circular diagram

Herbert Sinner (1900 - 1988), the former manager of the detergent application technology department at Henkel developed a detailed definition of the cleaning mechanism: The “Sinner” circular diagram, named after him, describes the parameters that determine the effect of a cleaning process.

The ”Sinner” circular diagram lists four parameters that determine the success of cutlery cleaning operations:

- **CHEMICALS**
  The amount of used detergents
- **MECHANICAL MOVEMENT**
  The intensity of the physical contact between the cutlery pieces and the porcelain media/process water
- **TEMPERATURE**
  The energy required to heat the process water
- **TIME**
  The duration of the cleaning cycle

„For environmental reasons the use of one-way plastic cutlery is decreasing in favor of stainless steel cutlery.”

Markus van den Hoogen

Application engineer for cutlery cleaning at Walther TrowaL

These four parameters of the circular diagram are interdependent. Even though their relative importance can vary, their combined input always amounts to 100%. A well-known example is the “ECO” mode in dishwashers and washing machines that compensates for a lower water temperature with longer cycle times. In the BRA cutlery cleaning systems the desired savings in” chemicals” and “temperature” are offset by the intensive, yet gentle, physical contact between the cutlery pieces and the porcelain media. This means that the circular segments “temperature”, “chemicals” and “time” become smaller and the segment for “mechanical movement” is increasing substantially.

Processing material for cutlery cleaning

About Walther Trowal

Surface refinement technologies from the inventor of the "Trowalizing" process.

Since 1931 Walther Trowal has developed and supplied solutions for the surface refinement of a wide range of products. Based on the mass finishing technology, generally known as "trowalizing" – derived from the term "Trommel Walther" – the company has continuously expanded its portfolio. Today Walther Trowal offers a wide range of mass finishing, shot blasting and coating solutions for components made from metal and other materials.

The cutlery cleaning systems are based on the mass finishing technology. Cutlery must also have a perfectly clean, shiny surface! And this must be achieved for large volumes of cutlery pieces in the shortest possible cycle time.

Walther Trowal offers complete finishing solutions, which can be seamlessly integrated into the interlinked manufacturing systems of the customers. The solutions include the adaptation of the process technology to the customers' work pieces and the perfect matching of equipment and consumables. Walther Trowal is one of the few suppliers who develop and produce their equipment and consumables, such as ceramic & plastic media and compounds, in-house.

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