Industry

Ultrasonic and steam cleaning technology
for industrial parts cleaning in service and workshops

- Up to date ultrasonic and steam jet cleaning technology
- Ultrasonic serial devices and modular ultrasonic cleaning lines
- Thoughtout accessories and suitable ancillaries
- Elma cleaning chemistry - developed for industrial applications
Industrial parts cleaning for workshops and service

During production and further processing of material goods or merchandise in factories and plants, a wide range of cleaning tasks apply. Precision is required here (as well). Only clean parts without residue can be coated, varnished, glued or soldered.

For this reason, professional parts cleaning before further machining or processing as well as final cleaning before delivery is required for the production of high-quality parts and assemblies. Even during component and assembly overhaul, our cleaning units and systems are being used before and after maintenance for quality control and conservation of value of the parts.

Ultrasonic cleaning is a highly innovative and eco-friendly cleaning method replacing various established procedures. This is why Elma ultrasonic and steam cleaning technologies are used in different industrial fields and for different cleaning tasks.

Main focuses of precise and reliable parts cleaning for intermediate cleaning

- after processing
- before coating, honing, lapping, passivation and polishing, etc.

for final cleaning

- before measuring,
- assembly and
- packaging.

Application example - Cleaning of carburetors and other engine parts

Ultrasonic cleaning restores your carburetor to renewed splendor. Combined with the specially developed, alkaline cleaning agent, Elma Tec Clean A5, even stubborn, burnt-in residues as oils, grease or even corrosion residues are removed precisely and gently with simultaneous optical brightening of aluminum and steel parts.

Even stubborn, burnt-in contaminants such as oil, grease or corrosion residues are removed in just few minutes.

The gentle ultrasonic cleaning extends the service life of carburetor and engine parts very much and spare costs can be saved.
Elmasonic S
Reliable ultrasonic technology

Elmasonic S units are available in 17 different sizes and have all technical features that are indispensable for industrial applications.

**37kHz ultrasonic frequency**
Typical industrial cleaning applications are carried out reliably and thoroughly in the powerful units.

**Degas-function for quick degassing**
The special Degas mode allows quick degassing of the cleaning liquid, particularly in freshly mixed ultrasonic baths.

**Sweep-function for sound field distribution**
In Sweep mode the “electronic oscillation” cleans the immersed items independent of the filling level, and the ultrasonic power is the same throughout the tank.

The basis for the optimised ultrasonic performance are the transducer systems. An intelligent generator automatically adjusts itself to the filling level and transmits the required ultrasonic power safely into the liquid.

Elmasonic S ultrasonic units have also
- electronic time and temperature control,
- performance transducer,
- heating safe to run-dry and
- temperature-controlled auto-start function.

Elmasonic S units are thus reliable and cost-saving in daily use.

Elmasonic S 30 H with basket and cover

Here you find more technical details on Elmasonic S devices.
Elmasonic P
Multi-frequency units with strong power and exceptionally silent

The digital display of the Elmasonic P devices are self-explanatory, easy to handle and very user-friendly. All target and actual values are easily identifiable and clearly legible.

One instrument - Two frequencies
Each Elmasonic P has two frequencies integrated which - depending on the task - can be manually changed.

- 37 kHz frequency:
  for coarse cleaning tasks or degassing of new cleaning baths.

- 80 kHz frequency:
  ideal in silent workspaces with extension of the application time at the same time, ideal for the cleaning of inner areas of parts e.g. in capillaries.

Functions of the Elmasonic P Line

- **Normal-Mode** for all cleaning applications
- **Pulse-function:**
  activable extra power of about 20% through increased ultrasonic peak
- **Sweep-function** for an even distribution of the ultrasonic power throughout the unit
- **Degas-function** for the quick degassing of new cleaning baths

- **Individual power regulation**
  for sensitive surfaces the ultrasonic power can be individually reduced

Additional functions

- **Pause-function** for interrupting a current application
- **Temperature-controlled auto-start**
  starts the ultrasound automatically when the set temperature is reached

Here you find more technical details on Elmasonic P devices.
Elmasonic xtra TT
Robust tabletop ultrasonic devices for heavy-duty applications

Elmasonic xtra TT tabletop ultrasonic devices are designed for use in production environments, workshops and servicing. Features like the permanently integrated Sweep-function, the switchable Dynamic-function or the individually settable limit temperature with LED warning indicator make the cleaning of parts in day to day work much easier.

All functions and cleaning parameters like time and heating preselection and ultrasonic frequency are arranged user-friendly on the control panel on the front of the device where users can set and monitor them at a glance. With their ultrasonic performance of 35 kHz, Elmasonic xtra TT devices are rated for continuous heavy-duty operation. The tanks are made of special stainless steel, which makes them robust with a long service life. If they are used in single-shift operation, they are guaranteed for three years.

Robust tank made of special stainless steel with fill level marking and sloping trough base to drain the device more easily

Clearly arranged control panel that is protected from spraying water with
- Individual time and temperature regulation
- Tried and tested Sweep function
- Start/stop and Dynamic-function
- Settable limit temperature with LED warning indicator

Quick and easy draining of the contaminated cleaning liquid via the ball valve drain

Functions of Elmasonic xtra TT ultrasonic devices:
- Permanently integrated Sweep-function for uniform distribution of the ultrasonic effect in the entire ultrasonic bath.
- Switchable Dynamic-function increases the peak ultrasonic performance. This improves the effectivity of cleaning and makes it possible to remove even the most stubborn contaminants.
- Individually settable limit temperature with LED warning indicator on reaching the temperature. Sensitive parts like jewellery or plastic parts are handled gently.
- Clearly arranged, control unit that is protected from spraying water.
- Temperature-controlled Auto-Start function: the ultrasound starts automatically when the preselected temperature is reached.
- User safety with safety shutdown
Elmasonic TI-H
Ultrasonic devices for different applications

Elmasonic TI-H ultrasonic devices with multi-frequency can also be used in an industrial laboratory. The tanks are also made of cavitation-resistant steel and thus very durable even under rough conditions.

Due to the multi-frequency power various applications and cleaning tasks can be performed.

Elmasonic TI-H units are equipped with

- **Sweep-function**
  for an even sound field distribution
- **Degas-function**
  for quick and easy degassing
- **adjustable ultrasonic power**
- **Long service life** and extended warranty period of 3 years on the tank due to the special cavitation proof stainless steel
- **Timer**
  ultrasonic operation can be set between 0-15 min

**Interchangeable multi-frequencies** - MF2 and MF3 version -

- **25/45 kHz** - MF2-version:
  - 25 kHz:
    for coarse cleaning and removal of lapping or polishing media
  - 45 kHz:
    for fine cleaning and removal of oils and fats; ideally for hard surfaces like metal and glass

- **35/130 kHz** - MF3-version:
  - 35 kHz:
    for the removal of oil and grease from hard surfaces such as metal and glass
  - 130 kHz:
    for the cleaning of sensitive surfaces
Elmadry TD
Efficient drying of cleaned parts for best cleaning results

Elmadry TD (available in 3 unit sizes) are fitted with cold and hot air blower (70 °C), so even sensitive parts can also be dried gently. In cold air operation, the parts to be dried can also be cooled quickly.

- Multiple machine loading with baskets
- The hot air function is activated while the cover is on. The cover reduces also energy consumption.
- The cover has ventilation slots, ensuring that the moist air is conducted to the outside.
- The dust filter on the underside is replaceable and prevents re-soiling of the cleaned parts by the dust in the room air.
- Very user-safe thanks to the safety shutdown upon reaching the limit temperature.

Accessories for Elmasonic devices and for residual dirt analysis in workshop and service

A wide range of thoughtout accessories for Elmasonic S units supports working in the lab and facilitates many laboratory applications.

The range includes, amongst others, a practical cover which not only reduces the noise level, but also serves as a drip tray for wet baskets. Furthermore there are different holders and bins, e.g. for Erlenmeyer flasks or test tubes.

There are also suitable baskets for different ultrasonic units

- in different dimensions and
- with different mesh size:
  - 7x1 mm, 9x1 mm or 16x1,2 mm

The different baskets can be loaded with 1.0 - 30.0 kg.

For the residual dirt analysis the particles must be removed from the test item before the actual analysis is carried out. After removal, the dirt particles are filtered and analysed.

The right ultrasonic units with thoughtout accessories are crucial for a successful analysis. Ultrasound with its pre-defined parameters is a suitable and cost-saving method for this.

Specifically the Elmasonic S 120 (H) ultrasonic device is suitable for residual dirt analyses. Covers with holes and plastic tubs, developed for residual dirt analyses in the Elmasonic S 120 (H), facilitate the work.

To prevent a recontamination, two glass beakers are inserted in the stainless-steel or PP-cover with holes. The ultrasound is transmitted through the liquid in the tank.
Elmasonic xtra ST  
Powerful ultrasonic single-tank devices

With 8 different tank sizes, the Elmasonic xtra ST series has been designed for heavy-duty applications in production, workshops and service. The stainless steel casing and the durable transducer tank are built for permanent operation. Thus Elma gives a 3-years warranty on the resistant, special stainless steel tank provided the unit is used properly and one-shift operated.

With the large number of features, the units can be easily and efficiently operated. All units are mounted on rollers and can easily be shifted to various workplaces in production or workshop. The up front arranged operating panel allows the quick and easy setting of all relevant parameters such as cleaning time, heating temperature or frequency.

Advantages of Elmasonic xtra ST series

- **Multi-frequency at 25/45 kHz**: individually settable frequencies depending on the cleaning job.
- **25 kHz for rough part cleaning** and removing stubborn contaminants like lapping and polishing paste, for example.
- **45 kHz for cleaning sensitive parts** and surfaces from contaminants like oils, drilling emulsions and greases. Also ideal for hard metal and glass surfaces in industrial and artisan environments as well as jewellery manufactures.
- **Sweep-function** for optimum sound field distribution and cleaning performance in the entire ultrasonic bath.
- Switchable **Pulse-function** increases the peak ultrasonic performance output. This uprating makes it possible to remove even the most stubborn contaminants.
- **Dynamic-function**: The Sweep- and Pulse-functions run alternately on an automatic basis. The ultrasonic performance is temporarily increased by up to 20%. At the same time, the even ultrasonic sound field distribution in the ultrasonic bath enhances the cleaning effect.
- **Short heating times due to the high heating capacity with temperature regulation (30 - 80°C)**
- **High user safety** with automatic safety shutdown
- **Easy to service** due to quick changing of the generator and operator control unit. This means that the devices are ready for use again very quickly and are highly available for users.

Elmasonic xtra ST 600H with hinged cover

Here you find more information on Elmasonic xtra ST devices.
Elmasonic xtra basic 1900S
Cleaning filters with ultrasound

A high-performance ultrasonic cleaning system not only reduces your spare part costs but also ensures that your filters are cleaned quickly and thoroughly. Filter cleaning covers a vast range of applications:

- electrostatic filters
- grease filters
- hydraulic filters
- air filters
- fuel filters, ...

while contributing greatly to environmental protection through reusing your filters.

Over time, traditional filter cleaning reduces separation efficiency. But state-of-the-art ultrasonic cleaning in combination with the Elma cleaning solution provides gentle, fast and highly effective cleaning and regeneration of filters.

Ultrasonic filter cleaning has the following advantages:

- Time-Saving
- Cost Reduction
- Extension of filter life

Recommended process steps

- Pre-cleaning
- Cleaning in the ultrasonic bath with Elma Tec Clean A5
- Rinsing
- Drying
- Final inspection

Additional benefits

- Reduced spare part costs
- No loss in separation efficiency of the filters
- Filters can be cleaned multiple times
- Low-cost, efficient filter cartridge regeneration using a purpose-designed device
- Great flexibility and response options through multifrequency and Pulse-mode
- Lateral ultrasound prevents cavitation damage on the tank floor
- Long operating and service life of the tank
Elmasonic X-tra line Flex 1 and 2
Manual ultrasonic cleaning lines

- 5 tank sizes available
- **Multi-frequency** for coarse and fine cleaning
- **Pulse-function** to intensify the ultrasonic power
- **Sweep-function** for the optimized and even sound field distribution
- **Degas-function** for the quick degassing of new cleaning baths
- Extensive range of ancillary components (filter pump aggregate, oil separator, pure water units, hand shower device, etc.)
- Complete **module for pre-cleaning and follow-up rinsing** before and after the intensive ultrasonic cleaning – perfectly for workshops and decentralizes workstations.
- Can be operated with tap water or DI-water
- No dilution of the cleaning bath due to **separate rinsing water discharge**
- Optionally available on support frame or with **oscillation** for supporting the ultrasonic cleaning bath
- X-tra line Flex 1 and 2 modules are optionally available with Elmasonic X-tra LSM units for solvent-based cleaning processes

The easily pluggable rinsing station allows pre-cleaning by hand shower, subsequent ultrasonic fine cleaning and follow-up rinsing.

Here you find more technical details on Elmasonic X-tra line Flex 1 devices.
Elmasonic XL and Elmasonic X-tra LSM
Ultrasonic devices for special cleaning applications

Elmasonic XL
- 3 tank sizes available (140 - 300 litres)
- **Multi-frequency** with 25/45 kHz for coarse and fine cleaning
- Ideally for the removal of polishing pastes, particles, oil and grease
- High ultrasonic power with **bottom-mounted ultrasound** or optionally with **side-mounted ultrasound on 2 or 3 sides**
- „Controlled cavitation field“ With side-mounted ultrasound on 2 sides, the cavitation fields can be controlled to optimize the sound field distribution.
- Clearly arranged operation display and very easy handling
- All units are equipped with oil-overflow basin to allow the connection of an oil separator
- **Optionally available oscillation device for the cleaning basket** for rinsing off contaminations in the ultrasonic bath
- Optionally available hinged flip-top noise protection cover

Elmasonic X-tra LSM
- Save cleaning with flammable and aqueous liquids
- 2 unit sizes with 28 and 60 litres
- **Multi-frequency** with 25/45 kHz
- Built-in explosion protection against the forming of explosive atmospheres (**primary explosion protection**)
- TÜV certificate (TÜV = German technical surveillance) for the use of solvents with ignition point above 55 °C
- Permanent operation possible due to cooling device ensuring a constant operating temperature
- Within threshold limit values due to optional edge suction device
- Elmasonic X-tra LSM devices are also as Flex 1 or Flex 2 modules available
**Accessories and ancillary equipment**
for Elmasonic stand-alone units and modules

### Baskets and trays

- Standardised baskets and tray available, depending on cleaning tasks and requirements.

### Drying devices

- Hot air dryer with or without HEPA-filters
- Digital display of set and actual temperature
- Very safe due to integrated limit temperature monitor
- Extremely short drying period

### Bath care systems

- Filter-pump aggregates for skimming on the surface or at the bottom

### Advantages of bath care systems

- Dirt particle separator
  - for a prolonged service period of cleaning baths
- Increased ultrasonic cleaning power
- Stable bath quality
- Cost reduction due to reduced waste water quantities and low energy consumption
- Suitable for various media
Elmasteam 8 and Elmasteam 45
Cleaning, rinsing and drying - all with only one device!

Large quantities of oil, lubricants, polishing pastes and swarf occur frequently in industry and in workshops due to the processing with machinery. In order to clean the workpieces effectively, pre-cleaning with steam is recommended. During the cleaning process with steam, no chemical cleaning agents are used. Thus the contaminations accrue as undiluted and concentrated as possible and less disposal costs occur. In order to clean the workpieces effectively, pre-cleaning and cleaning with Elmasteam 45 basic or Elmasteam 8 basic steam jet cleaners is recommended.

- 4 or 8 bar steam pressure
- Ideally for pre-cleaning, rinsing and cleaning of workpieces and construction components
- Cleaning of sensible surfaces
- Cleaning of soft and sticky contaminations, oil, polishing pastes, residual glue, etc.

Elmasteam 8 basic with fixed nozzle and hand piece

- High heating power
- Interchangable between steam and compressed air (if compressed air function is integrated)
- Optional pump for continuous operation without interruptions
- Rinsing with steam for stainless surfaces
- Cost-efficient due to multiple applications
- Adjustable pressure modes "soft" and "strong"
- Individual regulation of moisture in the steam (wet or dry steam)
- Optional with Brita water filtering cartridge to reduce maintenance efforts and extent service intervals

Elmasteam 45 basic and basic HP

Application examples before and after cleaning

<table>
<thead>
<tr>
<th>STL components</th>
<th>Flange</th>
<th>Gear drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of wax</td>
<td>Removal of grease and silicone</td>
<td>Removal of oil and swarf</td>
</tr>
</tbody>
</table>

With the Elmasteam steam jet cleaners, industrial contaminations such as pickling agents, adhesive wax and other residues can also be gently removed.
The foil test
Quick and easy check of ultrasonic power

The so-called foil test is a common and very inexpensive way to verify and display the ultrasonic or cavitation performance and distribution in the ultrasonic bath is. For the foil test, a thin aluminum foil is placed for a pre-defined period of time into the ultrasonic bath.

Depending on the degree of cavitation, the foil will be visibly perforated/destroyed. This image of the perforated foil is the basis for the evaluation of the ultrasonic power and distribution in the cleaning bath. The foil test should be conducted at regular intervals (depending on the operating time). In order to compare the test results over a longer period of time, the foil test always has to be conducted under the same conditions.

Important parameters for reproducibility are:

- Position of the aluminum foil in the ultrasonic bath
- Properties of the aluminum foil (size, thickness, surface)
- Liquid level and temperature of the ultrasonic bath
- Degassing of liquid in the ultrasonic bath before testing
- Irradiation time
- Concentration and type of added concentrate

How to realise the foil test:

- Fill the ultrasonic bath with water and a suitable tensidic concentrate (1:100 / concentrate:water).
- Degas the liquid for some minutes, depending on the volume of the bath, to reach the optimal ultrasonic power.
- Wrap a wire frame with aluminum household foil and place it into the cleaning bath. Depending on the bath size the frame may be poking out of the tank.
- Switch on the ultrasound and irradiate the foil at least for one minute until a visible perforation or holes occur.
- Switch off the ultrasonic unit, take the aluminum foil out and let it dry.

To compare the test results for ultrasonic power over a certain period of time, the irridiated foils should be labeled (number and type of ultrasonic unit, date of the test, etc.) and archived. For further use of the ultrasonic device, the tank must be thoroughly cleaned and residual foil particles removed after the test.

Validation of the foil test results

Perforation / ratholing with Normal and Pulse mode

Perforation / ratholing with Sweep mode
## Advantages of Elma Tec Clean chemistry

- Powerful cleaning concentrates from acidic to alkaline,
- Suitable for various cleaning tasks,
- Easily to dispose and **eco-friendly** as well as
- **Gentle** for most materials.

<table>
<thead>
<tr>
<th>Contamination</th>
<th>Surfaces</th>
<th>pH-value</th>
<th>Dosage proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light oil, grease, fluxing agents, dust and finger prints.</td>
<td>Substrates in the electronics (PCB) and optics industries (glasses, fine optics), electro-mechanical components. For the overhaul cleaning of plastics.</td>
<td>−10</td>
<td>3 - 10 %</td>
</tr>
<tr>
<td>Polishing, lapping and grinding residues, grease and oil.</td>
<td>Nonferrous metals, precious metals, brass, nickel, titanium. Check Zn and Al for resistance before use. Non-ferrous and precious metals are brightened up.</td>
<td>−10</td>
<td>5 - 10 %</td>
</tr>
<tr>
<td>Grinding and polishing residues, punching oil, drawing grease, soot, tinder, high-performance cooling lubricants.</td>
<td>Stainless steel, steel and other iron materials, titanium and precious metals, gray cast iron. Check nonferrous heavy metals, brass, glass and quartz for resistance before use. Not suitable for Al and light metals.</td>
<td>−12</td>
<td>3 - 8 %</td>
</tr>
<tr>
<td>Oil, grease, soot, coking, forge, dust and finger prints, polishing and lapping agents.</td>
<td>Stainless steel, steel, iron, gray cast iron, aluminium and light metals, brass, nonferrous heavy metals, precious metals, nickel, zinc, plastics, ceramics, glass, quartz, rubber.</td>
<td>−12</td>
<td>2 - 5 % Ultrasonic: 5 % without ultrasonic: 10 %</td>
</tr>
<tr>
<td>Forged and resinified oil and grease, lacquer and paint remnants, wax, grinding and polishing media.</td>
<td>Stainless steel, steel, iron, gray cast iron, Al- and light metals, nickel, stainless metals and Zn. Alkali-proof surfaces.</td>
<td>−12.5</td>
<td>3 - 5 %</td>
</tr>
<tr>
<td>Oil, grease, grinding, lapping and polishing media, dust, sweat and finger prints.</td>
<td>All metals, plastics, ceramics, glass, rubber. Check Mg for resistance before use.</td>
<td>−7</td>
<td>5 % Ultrasonic: 5 % without ultrasonic: 10 %</td>
</tr>
<tr>
<td>Rust, lime, oxide films (e.g. verdigris), grease and oils.</td>
<td>Nonferrous metals, stainless steel, Al and light metals, brass, steel, plastics, glass. For the passivation of surfaces of stainless and chromium-containing steels.</td>
<td>−3</td>
<td>1 - 5 %</td>
</tr>
<tr>
<td>Mineral contaminations such as lime, rust and other oxides; films that can be removed with corrosives, mineral grease, oil, polishing and lapping agents.</td>
<td>Stainless steel, steel, brass, nickel, nonferrous and precious metals, glass, ceramics and acid-resistant plastics. Not suitable for Al and light metals.</td>
<td>−1</td>
<td>1 - 5 %</td>
</tr>
</tbody>
</table>
Thoughout equipment for industrial parts cleaning are pre-requisit for perfect cleaning results. With the extensive product range, Elma is offering sophisticated solutions for cleaning workpieces and components.

With our core competencies ultrasonic and steam cleaning technologies and our process laboratory with its own cleaning agent development behind us, we provide competent and reliable advice and tailor-cut cleaning solutions for our customers for even the most difficult cleaning tasks.

We provide top quality in all manufacturing stages from design an development to service and after-sales-service.

Our process laboratory develops our own, for industrial applications optimized, cleaning agents which are produced in our plant.

A worldwide network of partners and distributors ensures high availability of devices and equipment with short response times.

Years of experience, innovative research and development as well as our industry-specific know-how make us the partner of choice for you. We consider trust and reliability to be the foundation of a sustainable partnership.

By providing you with Elma products and services, we want to contribute to your success as reliable, competent partner!