



Ultrasonics.Steam.Ultraclean.



Laboratory

Solutions for the laboratory – designed for professionals

Ultrasonic technology for the analytical, pharmaceutical and industrial laboratory

- Sieve Cleaning
- Sample Preparation
- Quick Degassing

Equipment designed for laboratory applications

As specialist for ultrasonic technology Elma works in close cooperation with their customers to develop new solutions for laboratory applications, such as analysing, sample processing and cleaning of laboratory instruments.

Thus our ultrasonic units are optimized for the use in laboratories and are indispensable both for research and for the practical use in the lab to find solutions for challenging tasks and to get reproducible test results. Furthermore Elmasonic units perform also specialized cleaning tasks, e.g. sieve cleaning. Therefore the product range encloses various different types of ultrasonic cleaners and each product series consists of units of different sizes.

Practical and thoughtout accessories facilitate the handling and meet the requirements of the everyday work in a lab.

The cleaning of laboratory glassware and laboratory instruments is a crucial task in any lab. Elma offers a special program of chemical cleaners which can be used both in ultrasonic units and in laboratory rinsing automats.

Working with Elmasonic ultrasonic units combined with Elma Lab Clean chemicals guarantees a highly efficient and environment-friendly results.

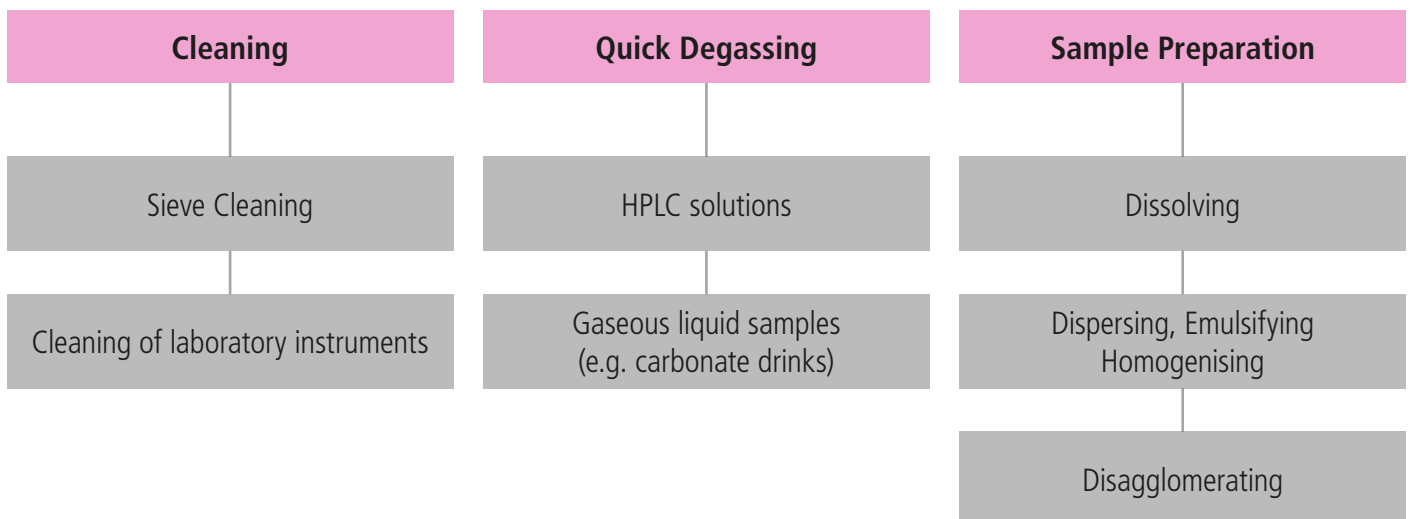


Elmasonic ultrasonic units with suitable accessories



Elma Lab Clean series

Applications in the laboratory



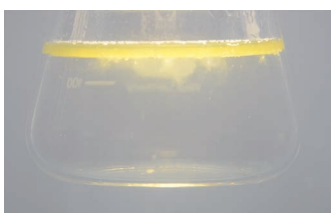


Cleaning

of laboratory glassware or laboratory instruments even in joints of articulated components and in hollow bodies. The cleaning of analytical sieves is quite a special application. Cleaning with an Elmasonic ultrasonic unit and in combination with Elma Lab Clean chemicals is at the same time highly effective, gentle and environment-friendly.

Degassing

for the reliable removal of gas from samples (e. g. for the removal of carbon dioxide) or for the degassing of HPLC solvents.

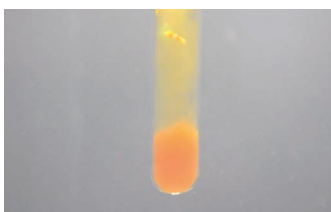


Emulsifying

of two liquids that are not ordinarily mixable, e. g. oil in water.

Dispersing

of substances that are not ordinarily mixable; generally solid substances in liquid, e. g. pigments in water.



Dissolving and homogenising

of hardly soluble substances for analytical purposes or for the production of analytical substances.



More information about applications with ultrasound.



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Elmasonic S

Reliable ultrasonic devices for cleaning, degassing and dissolving



Elmasonic S series

Technical Data

	S 10 / H	S 15 / H	S 30 / H	S 40 / H	S 60 / H	S 70 / H	S 80 / H
Tank working volume (l)	0.7	1.2	1.9	3.2	4.3	5.2	7.3
Volume max. (l)	0.8	1.75	2.75	4.25	5.75	6.9	9.4
Unit ext. dimensions W/D/H (mm)	206 / 116 / 178	175 / 180 / 212	300 / 179 / 214	300 / 179 / 264	365 / 186 / 264	568 / 179 / 214	568 / 179 / 264
Tank int. dimensions W/D/H (mm)	190 / 85 / 60	151 / 137 / 100	240 / 137 / 100	240 / 137 / 150	300 / 151 / 150	505 / 137 / 100	505 / 137 / 150
Weight (kg)	2.0	2.1	3.3	4.0	5.1	5.6	6.4
Basket int. dim. W/D/H (mm)	177 / 73 / 30	112 / 103 / 50	198 / 106 / 50	190 / 105 / 75	255 / 115 / 75	465 / 106 / 50	455 / 106 / 75

	S 100 / H	S 120 / H	S 180 / H	S 300 / H	S 450 H	S 900 H
Tank working volume (l)	7.5	9.0	12.9	20.6	35.0	75.0
Volume max. (l)	9.5	12.75	18.0	28.0	45.0	90.0
Unit ext. dimensions W/D/H (mm)	365 / 278 / 264	365 / 278 / 321	390 / 340 / 321	568 / 340 / 321	615 / 370 / 467	715 / 570 / 467
Tank int. dimensions W/D/H (mm)	300 / 240 / 150	300 / 240 / 200	327 / 300 / 200	505 / 300 / 200	500 / 300 / 300	600 / 500 / 300
Weight (kg)	5.9	7.5	8.5	11.0	25.0	45.0
Basket int. dim. W/D/H (mm)	255 / 200 / 80	250 / 190 / 115	280 / 250 / 115	455 / 250 / 115	455 / 270 / 194	545 / 450 / 250

More technical details.



*Elmasonic S
used in the laboratory*



Elmasonic S units are available in 13 different sizes and have all technical features that are indispensable for modern everyday laboratory applications.

37kHz ultrasonic frequency

Typical laboratory applications such as dissolving, emulsifying or dispersing are carried out reliably and thoroughly in the powerful units.

Degas-function for quick degassing

The special Degas mode allows quick degassing of HPLC solvents or gaseous liquid samples (e.g. carbonated drinks).

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

Accessories for Elmasonic S

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.



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Elmasonic P

Multi-frequency units with strong power and exceptionally silent



Elmasonic P series
available in 6 different sizes

Elmasonic P 30 SE - the homogeneous ultrasonic bath

Equipped with micro-processor controlled multi-frequency technology (37/80kHz), the Elmasonic P 30 SE is ideal for professional use in the laboratory.

Optimized sound field distribution

The optimal distribution of ultrasound across the whole bath is achieved with an optimized arrangement of the transducers on the tank bottom and the construction without integrated drainage. This ensures that the ultrasonic power is evenly distributed.

Elmasonic P functions

Furthermore, the Elmasonic P 30 SE has all the functions as Sweep, Pulse or Degas and advantages of Elmasonic P series like temperature-controlled auto-start, etc.



Elmasonic P 30 SE

Technical data

Tank working volume (l)	1.9
Volume max. (l)	2.75
Unit external dimensions W/D/H (mm)	300 / 179 / 221

Tank internal dimensions W/D/H (mm)	240 / 137 / 100
Weight (kg)	3.3
Basket internal dimensions W/D/H (mm)	198 / 106 / 50



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 device - 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 and for dissolving, emulsifying, dispersing and degassing.

- **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.



Elmasonic P 30 H

Function of the Elmasonic P Line

- **Normal-Mode:**

for laboratory applications such as mixing, dissolving, dispersing

- **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 samples or HPLC solvents

- **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



Normal



Pulse



Sweep



Degas

Technical data

	P 30 H	P 60 H	P 70 H	P 120 H	P 180 H	P 300 H
Tank working volume (l)	1.9	4.3	5.2	9.0	12.9	20.6
Volume max. (l)	2.75	5.75	6.9	12.75	18.0	28.0
Unit external dimensions W/D/H (mm)	300 / 179 / 221	365 / 186 / 271	568 / 179 / 221	365 / 278 / 321	390 / 340 / 321	568 / 340 / 321
Tank internal dimensions W/D/H (mm)	240 / 137 / 100	300 / 151 / 150	505 / 137 / 100	300 / 240 / 200	327 / 300 / 200	505 / 300 / 200
Weight (kg)	3.3	5.1	5.6	7.5	8.5	11.0
Basket int. dimensions W/D/H (mm)	198 / 106 / 50	255 / 115 / 75	465 / 106 / 50	250 / 190 / 115	280 / 250 / 115	455 / 250 / 115



More technical details.



Ultrasonics.Steam.Ultraclean.

Accessory equipment for laboratories

Right accessories for perfect results

In an analytical laboratory there are multiple different requirements for various laboratory applications and cleaning tasks. Elmasonic ultrasonic units can be used for dissolving, emulsifying or degassing and are also indispensable for various cleaning tasks. Practical and thoughtout accessory equipment optimizes and facilitates all possible applications.

The Elma product range encloses a large number of useful equipment - from glass beaker, holders (including cover with holes) to specialized holders for flasks, immersion cooling devices (to keep temperatures at a constant level) or acid-resistant tubs. With the aid of these elaborate helpers, almost any laboratory job can be done easily and quickly.



Noise protection in the laboratory

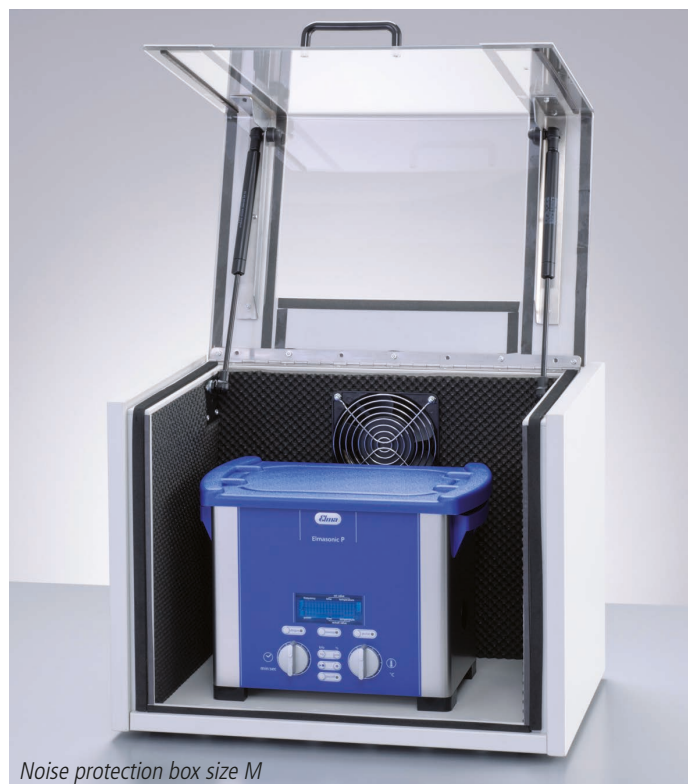
Noise can be a significant stress factor and has an impact on performance and concentration when working in the laboratory.

In order to keep the noise emissions at a minimum, Elma developed the powerful but at the same time very silent Elmasonic P series. A large amount of laboratory tasks can be carried out using the high 80 kHz frequency. The extended application time is more than compensated by the exceptionally silent operation.

For applications requiring higher power, the units can be operated at 37 kHz. To reduce the noise at a minimum, the unit can be placed in a noise protection box which is available in two different size.

A ultrasonic unit operating in a noise protection box is on average 3 to 4 times less noisy (dBA level) than when operated outside the box. The vapours produced during operation are carried off through a noise-reduced exhaust outlet.

The hinged cover has a large window so that the display and if necessary the tank can be monitored with closed cover. Due to the ventilation system the window does not steam up on the inside.



Noise protection box size M

Accessories for residual dirt analysis and special applications

The right equipment for correct analysis results



Cover with hole, made of PP



Plastic tub, made of PP

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.

Especially 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.



Cover with 2 holes, made of stainless steel



Test tube rack, made of stainless steel

Cooling or temperature-constant with the modular cooling coil system

For many laboratory applications, it is often required to keep a constant temperature in the ultrasonic bath or even cool it down.

In less than 10 seconds, the optional cooling coil turns every ultrasonic bath into an actively cooled one. It can be easily clipped on the tank and fits easily between basket and tank. For larger trays also 2 cooling coils can be combined and operated.

The cooling coils can be connected to a customer-provided cryostat or to the normal water supply.



Elmasonic with cooling coil

Elmasonic S 50 R and S 350 R

Professional equipment for sample preparation and test sieve cleaning



Elmasonic S 50 R



Elmasonic S 350 R

Sieve cleaning before and after the analysis

Sieve analysis is a standard process in the analytical, the food and the environmental laboratory and works perfectly if the sieves are cleaned to the last grain.

Elmasonic S units are fit for the intensive cleaning of individual sieves and for the simultaneous processing of up to 4 sieves. Special ultrasonic modes provide perfect cleaning results independent of the filling level.

For sieve cleaning the sieve is placed in the sieve holder and then put into the unit. The special "sieve cleaning" program uses two ultrasonic modes alternatingly which creates strong active cleaning pulses regardless of the filling level. The process can be standardized and repeated as required which makes it ideal for defined laboratory applications.

For the use in a food laboratory it may

be required to apply a cleaning medium which can be rinsed off without residues. For this purpose, the cleaning agent Elma Lab Clean N10 is reliable and well proven.

Test sieve cleaning with Elmasonic S 50 R and S 300 R:

- for 200 - 500 mm sieves
- with program-controlled ultrasound

Sample preparation and degassing of samples and of solvents for HPLC analysis



Degassing in the Elmasonic S 50 R and S 350 R is very efficient and noise-reduced. The Degas-mode alternates between maximum power and a special operating mode which moves the microscopic bubbles up and out of the liquid in a lift-out effect. In the beverage manufacturing industry, for instance, the carbonic acid gas is taken out of the samples before analysis.

HPLC solvents and the samples to be analysed can also be degassed in a short period of time.

The unit has an integrated laboratory stand connection to avoid the unpleasant noisy rattling of the glass on the tank floor.

- **Integrated special programs for sample preparation**
- Quick and efficient degassing of samples and HPLC solvents with the **pre-defined Degas-function**
- **Filling marks** for working with smaller bundles and for saving water

Elmasonic S 300 and sieve cleaning module SRH 4/200

The quality of cleaning results can be measured



Elmasonic S 300 (H) with SRH 4/200 sieve cleaning module



SRH 4/200 sieve cleaning module

In sieve analysis several sieves are used simultaneously. With the rotating module the throughput can be increased.

The sieves are placed into a universal support rack. The baskets rotate during cleaning and the inclination of the sieves ensures that the removed grains fall out of the sieves automatically.

- Time and cost-saving intensive cleaning of up to 4 analysing sieves (D 200 / 203 mm, 8").
- Sieves of different manufacturers can be processed simultaneously
- Gentle ultrasonic cleaning (as opposed to rough manual cleaning), tension of the tissue and mesh size are not changed; the measuring accuracy remains 100% unaltered.



Elmasonic xtra TT and Elmasonic TI-H

Ultrasonic cleaners with extra long service life for highest demands

Elmasonic xtra TT



In industrial laboratories, materials and products are analysed for quality assurance purposes both for the inspection of incoming items and for the pre-delivery inspection of manufactured products. Elmasonic xtra TT units are equipped with tanks made of special stainless steel, powerful transducers and come along with 2 cleaning functions for different applications and cleaning tasks.

- Permanently integrated **Sweep-function** for uniform sound field distribution and ultrasonic performance in the entire ultrasonic bath.
- Switchable **Dynamic-function** increases the peak ultrasound output. 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.
- Robust ultrasonic devices with tanks made of special stainless steel and ball valve drains for quick and easy draining.
- **User safety** with safety shutdown

Elmasonic TI-H

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; ideal 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



Elmasonic TI-H Serie
in 4 different equipment size

Elmasonic xtra ST

Single-tank units with multi-frequency technology for heavy-duty applications



With 8 different tank sizes, the Elmasonic xtra ST series of ultrasonic single-tank devices 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.



Elmasonic xtra ST 600H with hinged cover

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.

Elma Lab Clean

Cleaning chemicals for the laboratory

Advantages of Elma Lab Clean Cleaning solutions

- powerful cleaning concentrates from acidic to alkaline,
- suitable for chemico-analytical and biological laboratories as well as for tensid-free applications in measuring analysis,
- **non-foaming** and therefore **universally applicable** in ultrasonic baths and for splash and spray cleaning in laboratory rinsing automats,
- **prevent redeposition** of lime and lime soap.



	Contamination	Surfaces	pH-value	Proposal for dosage	Recommended application temperatures
	Blood, saliva, protein, bone and tissue residues, greases, oils, abrasives and polishing media, resinified and tarish residues, marker and label residues, fingerprints and dust.	Laboratory instruments made of alkali-resistant glass or plastic, porcelain, ceramic or metal. Not suitable for Al, Mg and light metal alloys.	~14	Ultrasound: ~ 1-2 % Rinsing: ~ 0.5-1 %	Ultrasound: 50-75 °C Rinsing: > 55 °C
	Light fat and grease, lime soap residues, fingerprints, dust.	Laboratory instruments for volumetric measuring analysis (pipettes, burettes, measuring cylinders) made of glass, stainless steel, ceramics and plastics. Not suitable for Al, Mg and light metal alloys.	11.5	Ultrasound: ~ 1 % Rinsing: ~ 0.5 %	Ultrasound: 50-75 °C Rinsing: > 55 °C
	Emulsions, fat and grease, dust, glass grease, resinified residues, marker and label residues, lime soaps and lime deposits.	Laboratory instruments made of glass, porcelain, ceramic, plastic or metal. Check for Al, Mg and light metal alloys before application.	11.3	Ultrasound: ~ 1 % Rinsing: ~ 0.5 %	Ultrasound: 50-75 °C Rinsing: > 55 °C
	Emulsions, marker and label residues, lime soaps, light oils and greases, fingerprints, dust.	Laboratory instruments made of glass, porcelain, ceramic, plastic or metal, incl. Al u. light alloys. Check Mg-alloys before application.	8.2	Ultrasound: ~ 2 % Rinsing: ~ 1 %	Ultrasound: 30-75 °C Rinsing: > 55 °C
	Lime and lime soaps, non-ferrous metal oxides, light mineral oils and grease, fingerprints, dust.	Laboratory instruments made of glass, porcelain, ceramic, plastic or metal, incl. Al-alloys. Check Mg-alloys and acid-sensitive glasses before application.	2.5	Ultrasound: ~ 1 % Rinsing: ~ 0.5 %	Ultrasound: 50-75 °C Rinsing: > 55 °C
	Lime and lime soaps, non-ferrous metal oxides, light mineral oils and grease, fingerprints, dust.	Laboratory instruments made of glass, ceramic, plastic or metal. Not suitable for Al, Mg and light metal alloys. Check acid-sensitive glasses and plastics before application.	<1	Ultrasound: ~ 1-2 % Rinsing: ~ 0.5 %	Ultrasound: 50-75 °C Rinsing: > 55 °C

Tips for ultrasonic applications

Tip 1 - Reduce the soil-moisture tension of the liquid

For a better ultrasound transmission into eakers, test tubes or acidic baths, the soil-moisture tension of the contact liquid should be reduced by a tensidic concentrate (e.g. rinsing or neutral cleaning agent). So that the ultrasonic power can be optimally used for the desired application.

Tip 2 - Adjust to the minimum coverage

For many sample preparation application a minimum coverage of 15-20% of the height of the immersed beaker or test tubes is enough for processing. With the same exact test results, you can save water and energy.



Tip 3 - Foil test

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:

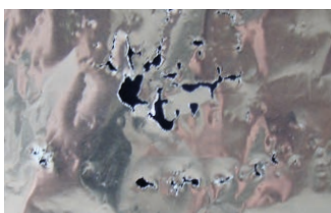
- position of the aluminum foil in the ultrasonic bath
- properties of the aluminum foil (size, thickness, surface)
- liquid level and temperature of the ultrasonic bath
- degassing of liquid in the ultrasonic bath before testing
- irradiation time
- concentration and type of added concentrate

How to realise the foil test:

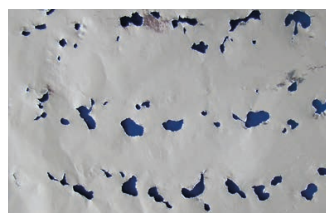
1. Fill the ultrasonic bath with water and a suitable tensidic concentrate (1:100 / concentrate:water).
2. Degas the liquid for some minutes, depending on the volume of the bath, to reach the optimal ultrasonic power.
3. Wrap a wire frame with aluminium household foil and place it into the cleaning bath.
Depending on the bath size the frame may be poking out of the tank.
4. Switch on the ultrasound and irradiate the foil at least for one minute until a visible perforation or holes occur.
5. 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 irradiated 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 (or sample preparation mode)



Perforation / ratholing with sweep mode



About us

Ultrasonic Technology · Cleaning Chemistry



Perfect cleaning results and irreplaceable helpers for laboratories are highly important for the efficient laboratory. With this large and thought-out product range, Elma is offering sophisticated solutions for analytics, sample preparation and for the cleaning of laboratory instruments such as sieves.

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

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

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

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

Years of experience, innovative research and development as well as our lab-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!



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