




Ultrasonic technology & Surface refinement

# Ultrasonics for cleanliness KKS Basic Line

 Swiss Quality

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KKS Basic Line

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Additional information can be found at:  
[www.kks-ultraschall.ch](http://www.kks-ultraschall.ch)

KKS Ultraschall AG

KKS Ultraschall AG is a complete solutions provider that develops, produces and distributes technologically advanced products in the fields of industrial cleaning, ultrasonic and surface technology.

As a dynamic, innovative and solutions-based company, we offer our customers environmentally friendly, commercially viable and technologically mature applications. The above factors, together with our application know-how and more than 30 years of experience, make us the perfect partner for your development and manufacturing projects.

We concentrate on our core skills and offer our customers the greatest possible benefits in terms of competitiveness and technological leadership.



# Compact ultrasonic devices for highest levels of flexibility



Every surface treatment process requires a preparatory and a final cleaning stage, areas in which ultrasonic cleaning has established and proven itself over the years.

The table top devices of the KKS Basic Line are the ideal solution for professional applications.

Ultrasonic cleaning is both an extremely thorough and – assuming the appropriate parameters are chosen – gentle process for a thorough cleaning of delicate surfaces.

The KKS Basic Line provides you with the highest degree of cleanliness with relatively short cleaning cycles, even in the case of complex, delicate parts with structured, porous surfaces and the tiniest grooves and holes.

## Cleanliness demands absolute precision

- **Powerful ultrasonics**

High levels of efficiency with constant power output

- **Operation**

User-friendly control elements for adjusting time, temperature and the special functions

- **Accessories**

Broad range of practical, high-quality accessories

- **Hygienic surfaces**

Chemically and mechanically resistant stainless steel for permanently safe hygienic surfaces

- **Dripping edge**

A dripping edge effectively protects the controls from excess cleaning liquid

- **Degas function**

For rapid degassing of the medium prior to cleaning

- **Boost function**

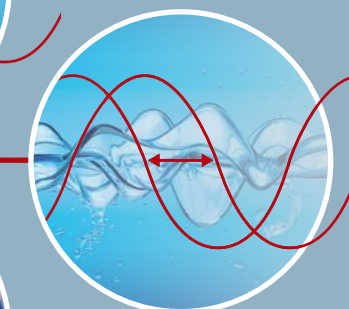
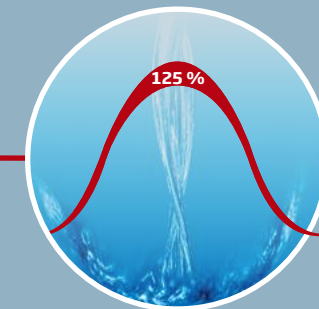
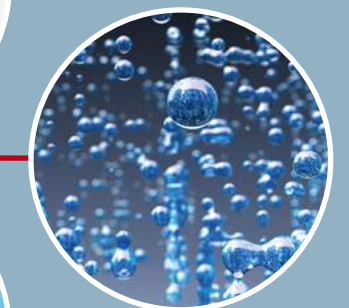
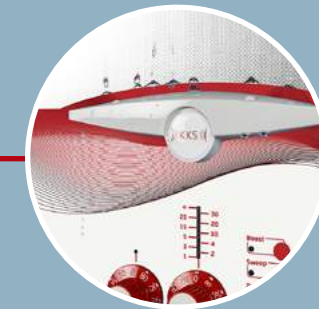
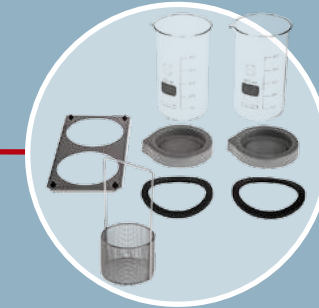
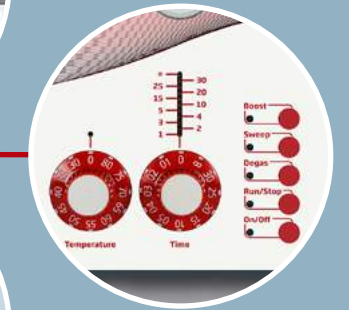
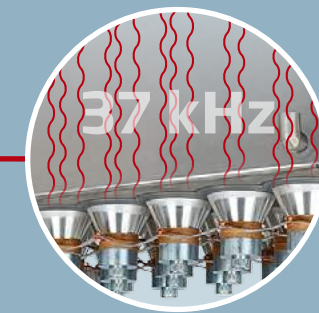
Increases cleaning performance by 25 percent to remove persistent contamination

- **Sweep function**

Shifting the maximum sound pressure level ensures a uniform sound field distribution and cleaning action in the bath

- **Guarantee**

24 months





Cleanliness at your service

**Transparency thanks to ultrasonic cleaning**  
The KKS-T1 to T6 devices guarantee intensive yet gentle cleaning of spectacle frames and glasses.

**Cleanliness promotes brilliance**  
Our specially developed cleaning agents reliably remove contamination such as the oxide films and polishing pastes used in production, as well as grease and cosmetics. Intensive cleaning in an ultrasonic bath puts the sparkle back into jewellery.

**Hygienic thanks to ultrasonic cleaning**  
Whether stains from rinsing water, organic or other forms of contamination, the use of ultrasonics cleans impression trays, prostheses, traces of plaster and instruments safely and without leaving any residues.

**Precision demands highest levels of cleanliness**  
Surfaces that are clean and totally free of residues are a must in precision engineering. Even the slightest contamination can cause malfunctions or the failure of components. The KKS Basic Line reliably removes lapping and polishing agents, grease, oil, wax, scaling, etc. without leaving any residues.

**Ultrasonic cleaning for greater efficiency**  
Craft businesses and workshops in particular benefit from the use of ultrasonic cleaning. Mechanical components are thoroughly cleaned without any scrubbing, brushing or scraping - even if the items being cleaned have a porous structure, complicated geometry, narrow gaps or blind holes.

**Cleanliness to the highest levels**  
Ultrasonic cleaning reliably frees brass instruments of production residues such as polishing pastes and the contamination that occurs when they are used. Quickly, gently and thoroughly.

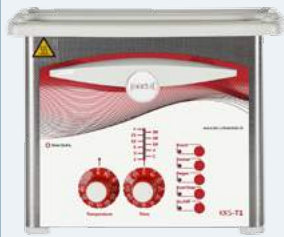



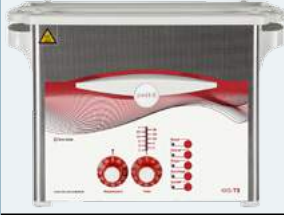








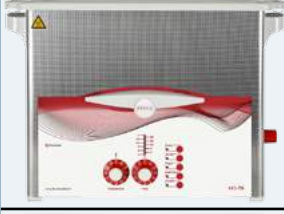
















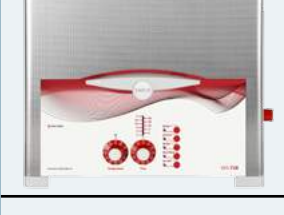







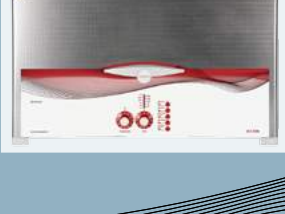




**Cleanliness in the lab**  
It is vital that persistent contamination, such as chemical residues, carbonization and dried up contamination, is removed if we want to be able to rely on the results of our analyses. Ultrasonics clean all those areas that a cleaning fluid can also reach and is thus an invaluable aid in the day-to-day work of a laboratory.

**Ultrasonics in the health service**  
Ultrasonic cleaning is a permanent part of the hygiene chain in hospitals and doctors' practices. Stains from rinsing water, organic or other forms of contamination are all removed without trace. This gentle treatment extends the service life and functionality of instruments.

**Quality brooks no compromise**  
The manufacture of mechanical watches demands the highest levels of precision. And this applies to cleanliness as well. Ultrasonic cleaning removes all traces of contamination and the residues that form during the manufacturing process from every part of the watch, guaranteeing a totally professional approach towards production and service.

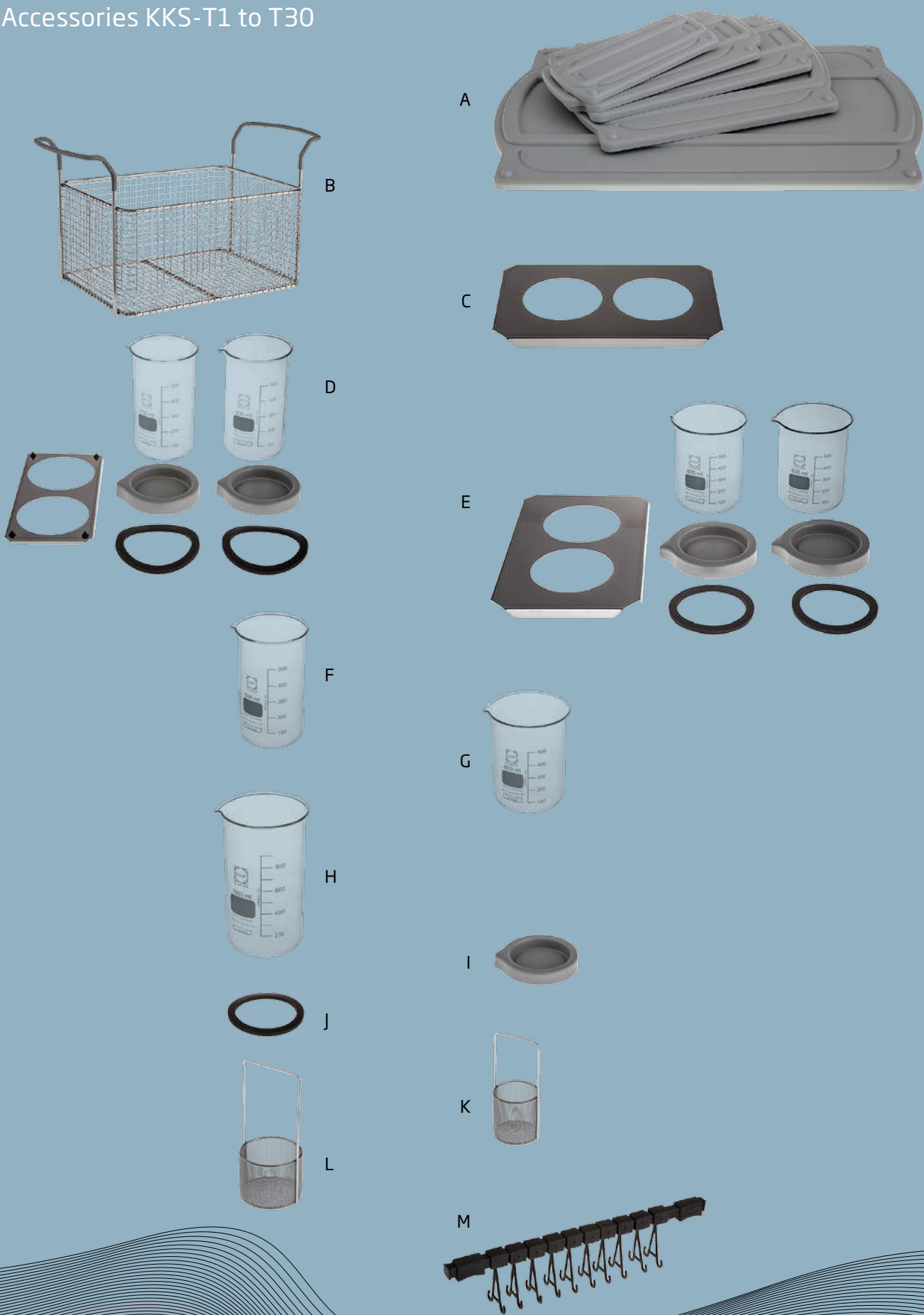
**Cleanliness in larger projects**  
In industry, intensive degreasing and cleaning of individual components is the decisive factor in determining the quality of the finished product. The KKS-T45 and T90 ultrasonic tanks are the perfect choice when it comes to cleaning large parts or large numbers of parts.

Table-top KKS-T1 to T30

	Description	Application area	Volume (Litres)	Internal bath dimensions (mm)	Heating	Drain	Art.-No.
	KKS-T1	  	0.8	L 190 W 85 H 60	–	–	127953
	KKS-T1-H				✓	–	128062
	KKS-T3	     	2.75	L 240 W 135 H 100	–	–	128063
	KKS-T3-H	 			✓	–	128064
	KKS-T3-H plus				✓	✓	128065
	KKS-T6	        	5.75	L 300 W 150 H 150	✓	✓	128066
	KKS-T12	     	12.75	L 300 W 240 H 200	✓	✓	128067
	KKS-T18	      	18	L 325 W 300 H 200	✓	✓	131770
	KKS-T30	   	28	L 500 W 300 H 200	✓	✓	128068



Accessories KKS-T1 to T30



Description	Internal dimensions (mm)	For type	Art.-No.
A Polymeric cover		KKS-T1/H	128057
		KKS-T3/H/plus	128071
		KKS-T6	128072
		KKS-T12	128073
		KKS-T18	131771
		KKS-T30	128074
B Stainless steel basket (mesh size 5 × 5 mm)	177 × 73 × 30 (L × W × H)	KKS-T1/H	128077
	198 × 103 × 50 (L × W × H)	KKS-T3/H/plus	128078
	255 × 115 × 75 (L × W × H)	KKS-T6	128079
	250 × 190 × 120 (L × W × H)	KKS-T12	128080
	280 × 250 × 115 (L × W × H)	KKS-T18	131772
	455 × 250 × 120 (L × W × H)	KKS-T30	128081
C Insert cover for beaker glass		KKS-T1/H	128084
		KKS-T3/H/plus	128085
		KKS-T6/T12/ T18/T30	128086
D Set: Insert cover, 2 beaker glasses with covers and retaining rings	dia. 80/600ml	KKS-T1/H	128087
E Set: Insert cover, 2 beaker glasses with covers and retaining rings	dia. 95/600ml	KKS-T3/H/plus	128088
F Single beaker glass, 600 ml	dia. 80	KKS-T1/H	128089
G Single beaker glass, 600 ml	dia. 95	KKS-T3/H/plus - T6	128090
H Single beaker glass, 1000 ml	dia. 95	KKS-T3/H/plus - T6	128091
I Cover for beaker glass, dia. 80 mm		KKS-T1/H	128092
I Cover for beaker glass, dia. 95 mm		KKS-T3/H/plus - T6	128093
J Retaining ring for all types of beaker glasses		All devices	128094
K Stainless steel basket (mesh size 1 × 1 mm)	dia. 59 x 60 (suitable for glasses dia. 80 and larger)	All devices	128095
L Stainless steel basket (mesh size 1 × 1 mm)	dia. 78 x 60 (suitable for glasses dia. 95 and larger)	All devices	128096
M Jewellery holder		suitable for KKS-T3 and larger	128097



For a large  
number of parts or larger  
parts...



In industry, intensive degreasing and cleaning of individual components is the decisive factor in determining the quality of the finished product. For many years, ultrasonic cleaning has proved to be an extremely efficient and thorough cleaning system, which is why the devices are frequently integrated directly into the production process.

The KKS-T45 and T90 ultrasonic tanks are the perfect choice when it comes to cleaning large parts or large numbers of parts. Their constant power output, reliability and low running costs mean they have quickly found favour in the production halls of cost- and quality conscious manufacturers.

## Cleanliness on a big scale

- **Powerful ultrasonics**

High levels of efficiency with constant power output

- **Operation**

Ergonomically positioned control elements with user-friendly functions for adjusting time, temperature and the special operations

- **Hygienic surfaces**

Chemically and mechanically resistant stainless steel for permanently safe hygienic surfaces

- **Emptying**

Drain at the rear side with lateral operation

- **Degas function**

For rapid degassing of the medium prior to cleaning

- **Boost function**

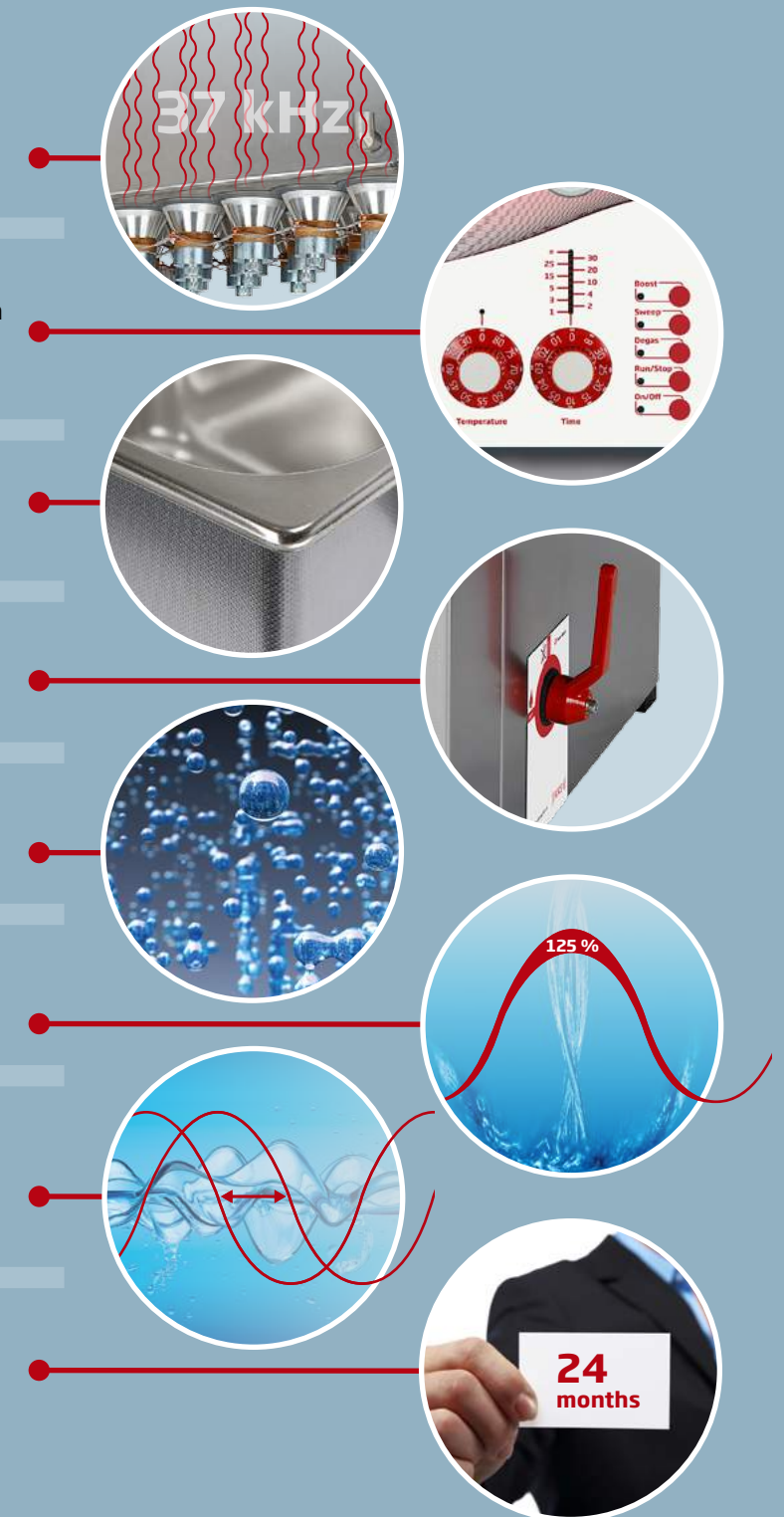
Increases cleaning performance by 25 percent to remove persistent contamination

- **Sweep function**

Shifting the maximum sound pressure level ensures a uniform sound field distribution and cleaning action in the bath

- **Guarantee**

24 months











Cleanliness on a big scale – KKS-T45 and T90



A



B

		Volume			Internal bath dimensions (mm)	Heating	Drain	Art.No.	
Description		Application area		(Litres)					
A	KKS-T45				45	500 × 300 × 315 (L × W × H)	✓	✓	128069
B	KKS-T90				90	600 × 500 × 315 (L × W × H)	✓	✓	128070

Accessories KKS-T45 and T90



C



D

		Internal dimensions (mm)	For type
			Art.No.
C	Stainless steel cover		KKS-T45
			KKS-T90
D	Stainless steel basket (mesh size 5 × 5 mm)	455 × 265 × 195 (L × W × H)	KKS-T45
		550 × 465 × 190 (L × W × H)	KKS-T90



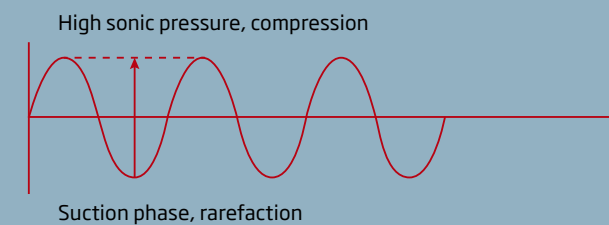
# Ultrasonic cleaning

## Cleanliness as a core competence

### How it works:

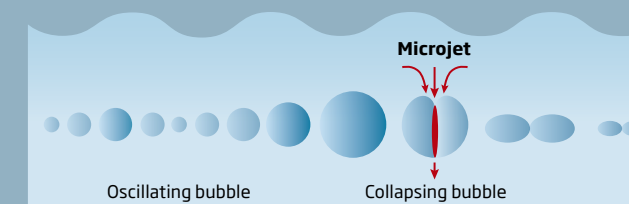
The electrical alternating field energy produced by an ultrasonic generator is converted into mechanical energy by piezoelectric transducer systems and transmitted into the bath liquid. This causes pressure changes within the liquid. Liquids are bound together by binding forces, often referred to as cohesive forces. These affect the individual atoms and molecules within a material and determine the tensile strength of a liquid.

### Compression /expansion



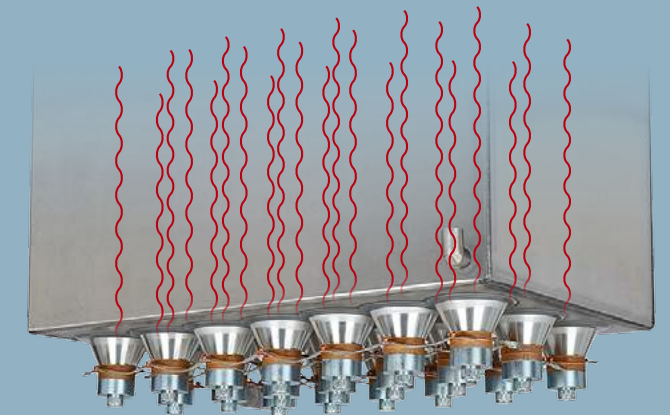
The pressure changes caused by ultrasonic waves (Expansion and Compression) tear apart the liquid's intermolecular bonds, creating transient and bubble-like cavities (bubbles), which are instantly filled with vapor due to vaporization of the liquid at the boundary of the cavity. During the compression phase, this vapor condensates again.

### Collapsing bubble with microjet near a boundary area



This creates millions of microscopic cavitation bubbles with oscillating sizes. If a sufficient level of ultrasonic energy is applied, the cavitation bubble can no longer oscillate in a stable fashion and collapses during the following compression phase ("transient

cavitation"), creating millions of smaller bubbles or disappearing into the liquid. This creates immense localized pressures (shock waves) as well as turbulences and currents. These phenomena are what actually causes the removal of dirt particles from the surface of the component. During this process cavitation bubble implosions occur mainly at the boundary areas between the liquid and the component. The microjets created by the sudden influx of liquid are directed to the surface - precisely where they are required for effective cleaning.





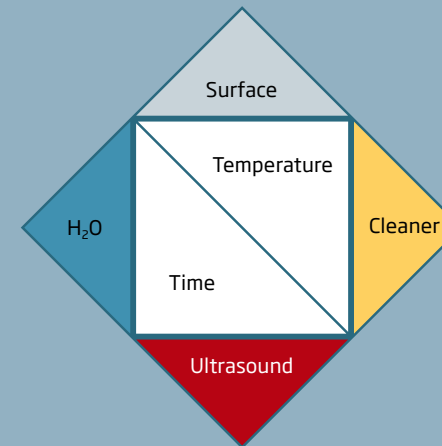
## A systematic approach to cleanliness



## Cleaning agents and their use

### Cleaning factors:

A number of factors have to be considered if ultrasonic cleaning is to be really effective. For instance, the material of the parts to be cleaned and the nature of the contamination determine which type of cleaning agent to use.



The extent of the contamination and the type of cleaning agent dictate the temperature that is set and the duration of the cleaning process, while the persistence of the contamination and the sensitivity of the material determine which ultrasonic parameters to use. Finally, rinsing of the parts with water of varying quality is extremely important to ensure that the cleaning agents and all the contamination they have picked up are completely removed from the surface of the part. Using demineralized water for the final step ensures the surface is spot-free after drying.

### pH value

Environmentally friendly water-based cleaning agents are available as alkaline cleaners, neutral cleaners and acidic cleaners (pH value).

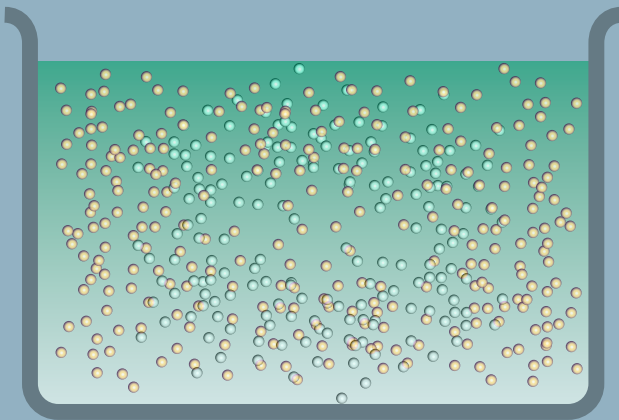
pH	Classification		Use
0	1 to 3	Strongly acidic	Fine cleaning, deoxidation/brightening; for stainless steel, aluminium
1			
2			
3	4 to 6	Slightly acidic	Fine cleaning, deoxidation/brightening; for stainless steel, aluminium, non-ferrous metals
4			
5			
6	7	Neutral	Standard cleaning - universal use, for all metals and polymeric materials
7			
8			
9	8 to 11	Slightly alkaline	Severe contamination; for stainless steel, steel, polymeric materials and aluminium to some extent
10			
11			
12	12 to 14	Strongly alkaline	Very severe contamination; for stainless steel, steel and non-ferrous metals to some extent
13			
14			

\* The pH value is a measure of the acidic or alkaline reaction of an aqueous solution.



Surfactants and how they work

Cleaning agents are categorised according to how the surfactants they contain react with hydrocarbons (oils and grease).



- **Emulsifying cleaning agents:**  
Cleaning chemicals containing emulsifying surfactants suspend hydrocarbons in the medium. A film of oil does not form on the bath surface.  
**Advantage:** No danger of re-contamination of the item to be cleaned, as it is not drawn through a film of oil when it is removed from the bath.  
Cleaning agents of this type are used predominantly for fine cleaning and satisfy stringent requirements.  
**Disadvantage:** The cleaning solution has a saturation point, which, when reached, results in re-contamination.



- **Demulsifying cleaning agents:**  
Cleaning chemicals containing demulsifying surfactants bind hydrocarbons together and separate them out. A film of oil forms on the bath surface.  
**Advantage:** Longer durability of the bath. These cleaning agents are used in primary or intermediate cleaning.  
**Disadvantage:** There is a danger of re-contamination. To prevent this, oil separation equipment should be installed.

KKS cleaning agents and additives

Chemistry	Description	pH	Quantity	Art.-No.
KKS-200-0010 liquid	<b>Highly acidic cleaning agent</b> Removes mineral contamination and oxide film. Suitable for all metals except light metals. Note corrosion protection required for steel, iron and grey cast iron.	<1.0	2.5 l	128114
			10 l	128115
			25 l	128116
KKS-200-0016 liquid	<b>Slightly acidic cleaning agent</b> Removes oxide film, limescale, grease, oil. Suitable for steel, non-ferrous metals, light metals, polymeric materials and glass. Note corrosion protection required for steel.	1.6	2.5 l	128111
			10 l	128112
			25 l	128113
KKS-200-0071 liquid	<b>Neutral, foam-inhibiting cleaning concentrate for hard surfaces</b> Aluminium and light metal alloys and for glass, ceramic, mineral and polymeric surfaces. Gently removes water-based cooling lubricants, grease and oil, fingerprints and dust.	7.1	2.5 l	128374
KKS-200-0093 liquid	<b>Neutral cleaning agent</b> Removes grinding, lapping and polishing agents, oil, grease, dust, sweat. Suitable for all metals, ceramics, glass, rubber, polymeric materials.	9.3	2.5 l	128108
			10 l	128109
			25 l	128110
KKS-200-0090 liquid	<b>Slightly alkaline anti-corrosion agent</b> Additive for metallic materials that are susceptible to corrosion, e.g. steel, cast iron and hard metals. The material is covered in a molecular coating that provides temporary corrosion protection.	9.0-9.5	1 l	128375
KKS-200-0110 liquid	<b>Cleaning concentrate with ammonia</b> Removes mineral and animal/vegetable oils, grease, lapping and polishing agents, traces of powder, oxides. Suitable for iron, brass, copper, precious metals and glass. Precious metal alloys and non-ferrous metals are brightened. Zinc and aluminum may be attacked.	10.5-11.0	2.5 l	128120
			10 l	128121
			25 l	128122
KKS-200-0105 liquid	<b>Weak alkaline cleaning concentrate</b> Removes flux residues, light grease, dust, fingerprints, etc. Suitable for electronic and optical substrates, electromechanical assemblies.	10.5-11.0	2.5 l	128117
			10 l	128118
			25 l	128119
KKS-200-0115 powder	<b>Alkaline metal cleaning agent for iron and light metals</b> Removes persistent contamination, such as scaling, resinified oils, paints, dyes, wax. Suitable for all metals.	11.5	0.85 kg	128106
			25 kg	128107
KKS-200-0130 liquid	<b>Alkaline cleaning agent for steels and precious metals</b> Removes punching oil, drawing grease, soot, grinding and polishing agents. Not suitable for light metals.	13.0	2.5 l	128100
			10 l	128101
			25 l	128102
KKS-200-0134 liquid	<b>Alkaline all-purpose cleaning agent</b> Removes oil, grease, soot, dust, fingerprints. Suitable for all metals, glass, ceramics, polymeric materials, rubber.	13.4	2.5 l	128103
			10 l	128104
			25 l	128105



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