Ultrasonic Cleaning Applications

iUltrasonic is here to educate our customers in every application of Ultrasonic Cleaners. You can navigate directly into one of our educational application categories below:

- Scientific Laboratory Ultrasonic Cleaning
- Automotive Parts and Marine Ultrasonic Cleaning
- Machine Shop and Industrial Ultrasonic Cleaning
- Medical and Dental Ultrasonic Cleaning
- Electronics and PCB Ultrasonic Cleaning
In the past few years, ultrasonic labware cleaning and ultrasonic instrument cleaning have been gaining in popularity. Chemical dust, baked on grease, dirt, oil, pigments, or fingerprints, among other typical lab contaminants can be effectively removed with ultrasonics.

Routine and critical laboratory equipment such as lenses, lab utensils, glass vessels, and lab plasticware can all benefit from ultrasonic cleaning. From the smallest units to the very highest capacity models iUltrasonic.com has it all.

Pharmaceutical labs, in particular, can employ large ultrasonic baths to clean stainless steel, Delrin®, and Teflon® plastic parts from tablet and capsule manufacturing equipment. Ultrasonic cleaners are especially effective for removing chemical residues from complex parts with crevices, small openings, and joints.

In addition to cleaning validation, ultrasonic cleaners and baths are used by chemical and pharmaceutical laboratories for solvent degassing and sample preparation. Ultrasonic baths rapidly degas HPLC solvents. Agglomerated samples are dispersed and difficult to dissolve samples are solubilized in powerful ultrasonic baths.
Accessories for ultrasonic baths include baskets for utensils, beaker covers to position 1-2 beakers in a tank, Erlenmeyer flask clamps, acid-resistant tank liners, test tube racks, and cooling coils to protect thermally labile samples.

From ultrasonic cleaning lab plasticware and glassware to mixing and emulsifying samples, iUltrasonic products have a broad range of laboratory uses.
An ultrasonic cleaner in your laboratory will save time and reduce effort while providing a safe solution for your cleaning needs. Let's take a look at some considerations you should keep in mind when using an ultrasonic cleaner on glassware, plasticware, and your lab instruments.

Whether you are cleaning beakers, bottles, vials, pipettes, or other labware, laboratory ultrasonic cleaners eliminate the time and effort of manual scrubbing. In fact, studies have shown that it can be up to 60 times faster while delivering thoroughly clean results. In addition, ultrasonic and small openings that can't be cleaned manually. Cleanliness of laboratory vessels and instruments is critical, as any residue from a prior laboratory procedure may contaminate the next experiment, test, or process.

Always wash glassware immediately after use. If this is not possible, allow the glassware to soak. There is a possibility that if the glass is not cleaned immediately some residues will be impossible to remove. Never soak for long periods in alkaline solutions, as this will damage the glass. When using an ultrasonic cleaner, place the glassware in a basket so that the objects do not come in contact with the bottom of the tank, the vibrating ultrasonic membrane. After the ultrasonic labware cleaning stage is finished, rinse with distilled or deionized water rather than tap water.
This will ensure that your items will dry completely and without spots. Finally, inspect the glassware to ensure that there are no cracks or chips, as this can affect future tests and samples.

Certain types of cleaning chemicals such as highly alkaline detergents can lead to clouding, crazing or stress cracking of plasticware, particularly polycarbonate. Long periods of exposure to strong oxidising agents are also known to cause plasticware to become brittle and prone to failure. For this reason, you should not use strong cleaning agents on plasticware. You should also never use abrasive cleaners or scouring pads which scratch the surface of plasticware. For ultrasonic cleaning lab plasticware, the same rules apply as glassware. Make sure to place the items in a basket to ensure they do not touch the ultrasonic membrane and rinse with distilled or deionized water after cleaning.

It should be noted that labware contaminated with biohazardous materials should be disposed of safely. In the event that it is to be cleaned, an autoclave should be employed.

Since many of your lab instruments are delicate, the key is to deliver fast, thorough results without causing damage. Ultrasonic lab equipment cleaning is the perfect solution since cavitation is very gentle while cleaning the entire surface. An ultrasonic cleaner is very effective for cleaning lab tools, microscopy parts, embedded samples, specimen mounts, etc. Like glassware and plasticware, they should be rinsed with deionized water so that they dry properly.
As you can see, the versatile capabilities of a laboratory ultrasonic cleaner make it the perfect solution for your lab. It is ideal for ultrasonic cleaning labware, both glass and plastic, and gentle enough to clean your delicate instruments. You can avoid the harshness of strong alkaline solutions that can damage glass and plastic as well as the scrubbing that can cause scratches. You will also reduce cleaning time, energy, as well as the risks involved with manual cleaning.
Ultrasonic labware cleaning is faster, safer, and more thorough than scrubbing, soaking, and even using steam. But how can you make sure that every time you use your ultrasonic cleaner the results will be the same? Let's take a look at the steps you should take to ensure that your labware and instruments are cleaned perfectly each time.

**Laboratory ultrasonic cleaning** delivers consistent results as long as the operator is consistent. Make sure that you are using the proper cleaning solution and then change it when it is visibly dirty or if you notice less bubble activity. Check to ensure that the solution is not below the level indicator in the tank. Use the right temperature for the proper amount of time for the type of item being cleaned. Variations in any of these factors can alter the results.

Before you can begin, the cleaning solution should be degassed. This means that the air entrained in the cleaning solution has to be removed. This can be achieved by raising the temperature and then running the ultrasonic energy for 10-30 minutes. You know that it completely degassed when you see no bubbles rising to the surface. Degassing is necessary only when the bath is filled with fresh cleaning solution. **Ultrasonic cleaners** equipped with a Degas mode achieve rapid degassing by pulsing the ultrasonic power, shortening the degas time to 5-10 minutes.
It is important that you use a basket or a tray for **ultrasonic cleaning labware**. It cannot touch the ultrasonic membrane (the bottom of the tank). Whether you are cleaning **glassware, disposable labware, plasticware, your lab tools**, etc., this last step should be followed. Make sure you properly rinse the items with water that has been deionized or filtered using reverse osmosis rather than tap water. This will ensure that your items will dry completely and without spots.

**Ultrasonic instrument cleaning** is fast and safe. For each run to be equally effective, you need to keep an eye on the cleaning solution and make sure that the temperatures and times remain consistent. Items to be cleaned should be raised at least ½ inch above the bottom of the tank using a basket or tray. Finally, make sure that each item is rinsed properly.
An ultrasonic carburetor cleaner cleans even gummed up carburetors. Stop wasting time hand cleaning!

- Fast and effective cleaning with no manual labor
- Powerful enough to remove carbon deposits yet gentle on aluminum parts
- Use water-based cleaning solutions, no toxic solvents

iUltrasonic offers rugged ultrasonic cleaning equipment built to last. The simple to operate cleaning tanks are available with heaters, drains, and stainless steel parts baskets.

Ultrasonic parts cleaners remove dirt, oils, lubricants, carbon, and other types of grime that build up on engines and mechanical parts. Grooves, internal passageways, seals, and other hard to reach areas are cleaned easily, eliminating hours of disassembling and reassembling complex parts. Carburetors, pistons, cylinder heads, aluminum parts, and brake calipers are a few examples of components that are cleaned thoroughly with no manual scrubbing in an ultrasonic parts cleaning machine.
Ultrasonic industrial parts washing is safe for the operator and the environment, with no need for toxic solvents.

*How does ultrasonic cleaning work?* Specially designed transducers transform electric energy into mechanical vibrations. These are transmitted into the cleaning liquid, creating many tiny vacuum-filled bubbles which rapidly implode. This process, called cavitation, releases highly energetic jets of liquid which remove all kinds of contamination from metal, glass, and plastic surfaces. Every surface that comes in contact with the fluid is thoroughly cleaned.

Popular applications for iUltrasonic equipment include ultrasonic carburetor cleaning, ultrasonic aircraft parts cleaning, ultrasonic exhaust manifold cleaning, ultrasonic crankshaft cleaning, and the list goes on.
Some mechanics have reported a 50% savings in cleaning time by turning to an ultrasonic parts cleaning machine while taking advantage of an ecologically safe alternative to manual cleaning with toxic chemicals. With today's industrial sized ultrasonic cleaners, the speed of ultrasonic cleaning to remove soils is combined with the capacity to clean multiple parts at once. Let's take a look at some specific examples of how an ultrasonic cleaner can save time and money while providing a non-toxic solution in the automobile, marine and aviation industries.

There are so many uses for an ultrasonic cleaner in an auto shop. Ultrasonic car parts cleaning saves time by eliminating the need for manual scrubbing of auto parts covered with grease, oil, and other lubricants. Besides freeing up time, the hazardous chemicals can be replaced with biodegradable soaps. Specific examples of items that are commonly cleaned by a benchtop ultrasonic cleaner include filters, shock absorber parts, power steering parts, pistons, valves, fuel injectors, bearings – just to name a few. Larger industrial-sized units can be used for ultrasonic carburetor cleaning and ultrasonic exhaust manifold cleaning, where cleaning action is needed deep within the network of passages. This large capacity also allows for ultrasonic crankshaft cleaning and ultrasonic cylinder block cleaning as well the means to clean multiple parts at once.
For marine mechanics, an ultrasonic cleaner can clean virtually any part within minutes and also provides an alternative to using toxic cleaning agents. When cleaning marine inboard and outboard motors, a cleaning solution that is both thorough and gentle is necessary because many parts are made out of aluminum. Not only do these parts need to be cleaned, but they need to be cleaned in a way that prevents future corroding. An ultrasonic boat part cleaner is the answer because ultrasonic cleaning is gentle enough to not harm the parts yet powerful enough to remove the soil. As with cars, an ultrasonic carburetor cleaner is employed to clean the carburetors from boat motors as well.

For aircraft mechanics, carbon deposits can present a cleaning challenge. Ultrasonic aircraft parts cleaning not only readily removes carbon deposits, but speeds up the cleaning process considerably and is much safer than working with the toxic chemicals previously used. An industrial-sized ultrasonic aircraft parts cleaner can accommodate large parts or multiple parts, including fuel nozzles, brake parts, turbine blades, and generator components. Parts are thoroughly cleaned and restored to their original condition, which is especially important in aircrafts.

Ultrasonic cleaners can help address many issues that mechanics face today: the need to save time and money and to protect both workers and the environment. By using an ultrasonic cleaner, the process of cleaning engine parts is greatly accelerated and expensive, toxic chemicals are replaced by a cost-effective, environmentally friendly alternative.
Ultrasonic parts cleaner takes the effort out of cleaning.

- Ultrasonic cleaning is thorough and fast
- Reduces labor, increases throughput
- Cleans crevices, threads, blind holes
- Ultrasonic degreasing uses environmentally safe fluids

An ultrasonic parts degreaser cleans more effectively than other types of industrial cleaning equipment. Cavitation, the collapse of millions of tiny bubbles created by ultrasonic vibrations, releases high energy and enormous cleaning power. This power dislodges hard to remove insoluble contaminants and grease from the surface of parts and reaches the smallest blind holes, threads, cavities, and crevices which are normally inaccessible to other cleaning methods.

Manufacturing processes use ultrasonic parts finishing to remove cutting fluid, polishing pastes, oil, loose burrs, and lapping abrasives from machined or fabricated parts. High throughput manufacturing makes use of ultrasonic batch processing with manual, semi-automated, or fully automated cleaning lines (click here for more information).
Repair and maintenance shops clean machinery, equipment and tools with ultrasonic cleaners avoiding labor-intensive manual scrubbing and washing with toxic solvents. Parts are readily degreased and cleaned in ultrasonic cleaners with environmentally safe water-based cleaning fluids.

**Ultrasonic metal finishing** aggressively removes solid materials from metal surfaces without damage. An absolutely clean substrate is critical for electroplating, electrophoretic coating, or powdercoating. Whether applying organic coatings or metal deposits, a high quality finished product can be ensured by ultrasonic pre-treatment cleaning.

iUltrasonic **bench top Ultrasonic Cleaners** are designed for every type of **industrial ultrasonic cleaning**. Our product lines include cleaners for occasional use as well as heavy duty equipment for continuous round-the-clock cleaning. Features, depending on the specific model, include timer, heater, drain, parts basket, cover, and a broad range of tank sizes.
There are many applications for an ultrasonic parts cleaner in a machine shop. In an environment filled with grease, lubricants, compounds, and other impurities, ultrasonic cleaning saves time and provides reliable, thorough results. Let's take a look at three different uses for ultrasonic cleaners in machine shops, including ultrasonic pretreatment of parts, degreasing of parts and tools, and refurbishing used equipment.

In the process of surface preparation and cleaning of parts before plating, ultrasonic pretreatment cleaning ensures the best results. Ultrasonic part cleaning will not damage polished surfaces as it removes polishing compounds and other impurities. Furthermore, you can avoid problems such as staining or poor adhesion in parts to be electro-plated. Opposed to conventional aqueous cleaning, ultrasonic batch processing allows the operator to clean multiple parts at once, increasing productivity.

For parts and tools that need to be degreased, many companies have turned to ultrasonic cleaning as an alternative to manual scrubbing. In fact, ultrasonic degreasing is the most widely used form of cleaning for parts to be electroplated. Depending on the application, the frequency used for degreasing should vary. Coarse removal of lapping abrasive and polishing media require a lower frequency (25-27 kHz) while more gentle cleaning of oils and grease should use a higher frequency (35-45 kHz).
An *industrial ultrasonic cleaner* can have an important role in *refurbishing equipment* as well. The refurbishing process includes taking the equipment apart; cleaning the unit as well as any parts that can be salvaged; replacing, repairing or upgrading damaged components; reassembling the equipment; and then doing touch ups or cosmetic enhancements. An ultrasonic cleaner is ideal for cleaning these parts prior to reassembly, thoroughly removing any oils, coolants, or sludge build up.

By looking at these applications, we can see that ultrasonic cleaning is faster than conventional aqueous cleaning without damaging the parts. Specifically, *ultrasonic pre-treatment of parts* allows for batch processing and removes polishing compounds, etc. without staining or reducing the adhesion in parts to be electro-plated. *Ultrasonic cleaning is perfect for degreasing tools and parts* without manual scrubbing, capable of handling jobs that require both firm and gentle cleaning. And in the process of refurbishing equipment, an *ultrasonic cleaner* is perfect for cleaning parts before the unit is reassembled.
Ultrasonic cleaners play a key role in maintenance and refurbishing of a very broad range of tools, equipment, and mechanical parts. As profit margins become slimmer, maintenance and refurbishing of used equipment help to reduce costs and keep companies profitable. These savings, in turn, are passed on to their customers, who have to manage tighter budgets themselves. In fact, in these difficult economic times an increasing number of industrial companies are opting to have their own equipment refurbished rather than replaced. Ultrasonic cleaners are important for manufacturers, their customers, and companies offering maintenance services, because all parties must optimize efficiency and reliability.

Whether a company offers refurbished equipment to its customers, is saving money by refurbishing in-house parts, or offers a refurbishing service, an ultrasonic parts cleaner plays a critical role in keeping cost down for everyone involved. If the cost of purchasing and maintaining a refurbished part is less than purchasing new, legitimate savings has been created. A key step in refurbishing is stripping the dirt, grime, oil, carbon and other soil built up on a used part. Ultrasonic part cleaning is the answer because it eliminates the need for manual scrubbing; works very fast, cleans even hard-to-reach areas of complex parts, and can be used to safely restore parts to their original condition.
Soaking a part in a cleaning solution and scrubbing it commits time and resources to the process, creating unnecessary expense. **Ultrasonic degreasing** not only eliminates the need for manual scrubbing, but it is versatile enough to meet various challenges. The correct selection of ultrasonic frequency, ultrasonic power, chemical cleaning solution, and temperature allow removal of both heavy soils such as carbon deposits, lapping abrasives and polishing media and light contaminants such as oil and dust. Also, compared to manual cleaning methods, ultrasonic batch processing provides the means to clean multiple parts in a single cycle. Typical cleaning cycle times are less than 30 minutes. Most cleaning can be accomplished with water-based soap solutions instead of hazardous solvents.

Representative examples of **ultrasonic industrial parts washing** include ultrasonic auto parts cleaning, ultrasonic PCB cleaning, ultrasonic cleaning electrical assemblies, ultrasonic aircraft parts cleaning, and ultrasonic cleaning molds for plastics processing.

In these difficult economic times an ultrasonic cleaner can be of great assistance in reducing time, effort, and cost across a variety of applications. **Ultrasonic cleaning** not only enhances the competitive advantage of the company using the technology, it also allows cost savings to be passed on to their customers.
Ultrasonic cleaning of medical instruments improves infection control and productivity

Safer and more efficient than manual cleaning

• Thoroughly removes blood, saliva, dirt, and other debris
• Will not damage delicate medical devices
• Cleans instruments with joints and crevices
• Protects lab workers from puncture wounds

iUltrasonic offers the highest performing medical ultrasonic cleaners for use in dental labs, doctors’ offices, hospitals, veterinary clinics, and at home.
Ultrasonic instrument cleaning benefits dental, surgical, ophthalmic, and veterinary practices.

Used medical instruments are often heavily contaminated with blood and body fluids. Before reuse, instruments must be cleaned, disinfected and sterilized. Thorough cleaning must precede disinfection and sterilization to ensure that these steps can be carried out effectively.

Surgical instrument cleaning in an ultrasonic bath physically removes organic and inorganic soils. If an item is not completely cleaned, the residual debris can actually protect microorganisms from disinfection and sterilization, rendering these processes ineffective.

Cleaning contaminated instruments in an ultrasonic cleaner is both safer and more efficient than cleaning by hand. This is particularly important for critical medical devices that have areas difficult to clean manually, such as joints, crevices, and lumens. Hand scrubbing, even with gloves, increases exposure to body fluids and leaves open the potential for puncture wounds from sharp contaminated tools.

Dental ultrasonic cleaners can also be used to clean dentures and crowns.

Dentist often recommend a dental ultrasonic cleaner to their patients for cleaning dentures at home. An ultrasonic denture cleaner is much easier to use at home than many other denture cleaning products, which require soaking and manual scrubbing.
Regardless of the medical discipline, ultrasonic cleaners have made life easier for all involved. Four areas that have benefited from the fast and effective use of ultrasonic instrument cleaning include the dental, surgical, ophthalmic, and veterinary industries. Let's take a look at some specific uses for an ultrasonic cleaner in each of these disciplines to show how they benefit the practitioner and patient alike.

Used surgical and dental instruments are often heavily contaminated with blood and saliva and must be completely cleaned before sterilization. Cleaning involves the removal of debris from an instrument or device. If visible debris is not removed, it will interfere with microbial inactivation and can compromise the disinfection or sterilization process. Automated cleaning with ultrasonic cleaners is far more efficient than cleaning by hand.

When you're sitting in the dental chair, it's reassuring to know that the dental picks, scrapers, carvers, spatulas, teasing needles, and other instruments have been cleaned and sterilized thoroughly. The reality is that these instruments have been in hundreds, perhaps thousands, of other mouths. For the dental assistants, many of the risks involved with cleaning instruments in the past are now avoided by circumventing the need for hand cleaning. Hand cleaning, even with gloves, always holds the potential for puncture wounds from sharp contaminated tools. The dental tools can now be placed in a dental ultrasonic cleaner to rapidly and thoroughly remove all contaminants in 10 minutes or less.
Besides being used to clean instruments, dental ultrasonic cleaners can be used to remove cement and plaster and to clean dentures, crowns, and other prosthetic materials. An ultrasonic crowner cleaner ensures that a crown is completely cleaned before being sterilized and affixed. In addition to using ultrasonic cleaners in their offices and laboratories, many dentists recommend a dental ultrasonic cleaner to their patients for cleaning dentures at home. An ultrasonic denture cleaner is much easier to use at home than many other denture cleaning products, which require soaking and manual scrubbing.

In hospitals and clinics, ultrasonic surgical instrument cleaning has become a regular practice. While all syringes must be disposed of after a single use, it is not economically feasible to replace every minor instrument. Therefore, it is necessary that all blood, tissue, saliva, and debris are removed from the surgical tools. Ultrasonic cleaners utilize an intense yet gentle process called cavitation to scrub all contaminants from the entire surface of any item immersed in the cleaning bath.
Veterinarians are also able to benefit from the time savings and effortlessness of ultrasonic technology. A veterinary ultrasonic instrument cleaner can be used for all their surgical and dental tools. No hand scrubbing means improved infection control and productivity in veterinary clinics. As in the other medical areas, maintaining instruments with ultrasonic cleaning enhances the condition of the instruments in both appearance and functionality.

Ultrasonic cleaners have penetrated all areas of medicine, and it's interesting to see that they benefit not only the doctors and their staff. Often ultrasonic technology is used by patients at home so that they can take advantage of the same ease of use, effort reduction, and time savings afforded.
In all areas of medicine, ultrasonic cleaning is one of the fastest, safest methods of cleaning tools and instruments. The same technology available to hospitals, dentists, optometrists, and veterinarians can be purchased from iUltrasonic for home use. In many cases, easy to use ultrasonic cleaners can replace the need for hand scrubbing and chemicals.

**How does ultrasonic cleaning work?** Cavitation, the collapse of millions of tiny bubbles created by ultrasonic vibrations, releases high energy and enormous cleaning power. This cleaning action gently and thoroughly removes dirt, oil, and contaminants from every surface in contact with the cleaning fluid. Because the liquid can penetrate into very small crevices, ultrasonic cleaning can clean intricate items that cannot be cleaned by hand.

When you visit the dentist, you may be aware that a dental ultrasonic cleaner is being used on all the instruments that go in your mouth, including dental picks, scrapers, carvers, and many more. Your dentist may even be using an ultrasonic crown cleaner to ensure that a crown is cleaned before being used. The same ultrasonic technology is available for use at home as well. An ultrasonic denture cleaner can be used to completely clean dentures, penetrating the hard-to-clean spaces between teeth and eliminating the need for scrubbing. Many young people are using ultrasonic cleaners for their retainers and removable orthodontic devices as well.
When you visit an optometrist, it is likely that optical lens ultrasonic cleaning is being used on contact lenses, eye glasses, and professional optical components. **Cleaning eyeglasses at home** with an ultrasonic cleaner is a fast and gentle way to keep them as clean as new.

There are many household products that can be safely cleaned in an **ultrasonic cleaning bath** such as tweezers, razor blades and shavers, combs, scissors, can openers, and items that have small openings that are difficult to clean by hand. In addition to health related uses, ultrasonic cleaning is ideal for jewelry, coins, tools, and many other products made of glass, metal, or plastic.

Please note that an ultrasonic cleaner is not a sterilizer. Medical and dental practices utilize ultrasonic cleaning to remove all visible soil from instruments prior to sterilization. Sterilization can be achieved only by methods that destroy microorganisms, such as heating in an autoclave. The phrase ‘ultrasonic sterilizer’ is a misnomer; never use an ultrasonic cleaner as a sterilizer.

iUltrasonic offers only professional ultrasonic cleaners with at least a 2-year warranty. There is simply no comparison between a professional ultrasonic cleaner and a cheaply-built unit. It’s like comparing a toy to a professional tool. Would you trust your family’s health to a toy? If you think that buying a very inexpensive ultrasonic cleaner will save money, be aware that an ultrasonic cleaner that does not carry a 2-year warranty is likely to last only a few months.
In addition, the cheap products will simply not clean very well or uniformly. A professional cleaner is designed to deliver the right amount of cleaning power and to distribute the ultrasonic power uniformly throughout the tank. A well-made tank has a stainless steel body that is resistant to damage from ultrasonic cavitation. A professional ultrasonic cleaner will give you many years of excellent service. And it’s so easy to use! Just add a suitable cleaning solution to the tank, place the items to be cleaned in the parts basket, and press start. Most items will be cleaned within 5-20 minutes depending on the nature of the soil being removed.

Healthcare workers have turned to ultrasonic instrument cleaning for all their surgical and dental tools. These same benefits afforded to professionals are now being enjoyed at home, many of them health related. From cleaning dentures to eyeglasses, ultrasonic cleaners offer a fast, effective, safe, and easy method of cleaning.
Ultrasonic PCB cleaning removes solder paste and flux residue.

Ultrasonic cleaning of PCBs is gentle and thorough.

- Rapidly achieves high level of cleanliness
- Will not damage delicate assemblies
- Cleans components with blind holes or complex geometries
- Uses aqueous or semi-aqueous cleaners
- Increases reliability of finished electronic products

Thorough ultrasonic cleaning of electronics plays a crucial role in assuring reliability of the finished product. Flux removal from assembled and reworked PCBs as well as solder paste removal from misprinted PCBs are critical process steps. An ultrasonic circuit board cleaner removes flux, even tenacious residues from lead-free and low-residue fluxes, from printed circuit boards with either through-hole technology or surface-mount components. Ultrasonic cleaning of electrical components offers clear advantages over spray washing when the components have tight clearances or tubular geometries.
An ultrasonic circuit board cleaner helps to improve SIR test results while reducing rework and increasing PCB reliability.

Ultrasonic cleaning electrical assemblies with delicate components is a safe way to remove contaminants from parts easily susceptible to damage. Tiny precision assemblies have inaccessible surfaces that cannot be cleaned by other methods.

Electronic devices can be safely cleaned in water with the appropriate chemical agent as long as they are properly dried. Many people hold the belief that electronics cannot be placed in water. This is simply not true. An ultrasonic electronics cleaner can be used quite effectively to maintain and restore a broad range of equipment.

iUltrasonic offers products specifically designed for optimum cleaning of circuit boards and electronics. Before the advent of Sweep technology, single-frequency ultrasonic cleaners generated a harmonic wave with the potential to damage electronic components. Our ultrasonic cleaners with Sweep technology eliminate the possibility of this type of damage.
Ultrasonic cleaning has become one of the most popular ways to clean electronics. The process saves time and improves results without compromising safety. Let's take a quick look at how an ultrasonic electronics cleaner can be used effectively for circuit boards, PCB, and electrical assemblies.

Ultrasonic cleaners now play a crucial role in the circuit board and electronics assembly process. An ultrasonic circuit board cleaner helps to improve SIR test results while reducing rework and improving reliability.

An ultrasonic cleaner can safely and effectively remove solder paste and flux residues from post-reflowed circuit assemblies. If you are using an ultrasonic cleaner to clean PCBs after wave soldering, it is easiest to begin soon after the soldering process. Make sure that you allow the boards to cool below 70°C before starting the ultrasonic PCB cleaning process.
In the past, ultrasonic cleaners operated at a single frequency, and it was found that certain components in electrical assemblies suffered damage from the harmonic vibrations set up by the ultrasonic wave.

However, ultrasonic cleaners using frequency “sweeping” have been developed that quickly and reliably clean the electrical assemblies without causing damage. In Sweep mode, the frequency is continuously varied slightly, eliminating the potentially damaging standing wave.

Although there may have been a concern in the past about ultrasonically cleaning electrical components, the frequency sweeping ability of today’s ultrasonic electronics cleaners should alleviate any trepidations going forward. From using an ultrasonic cleaner on circuit boards all the way to small electrical components, the cleaning process is now faster and safer than ever.
If you regularly clean electronic parts, an **ultrasonic electronics cleaner** is the best tool for the job. The common concern is that ultrasonic cleaners will destroy delicate components. However, advances in ultrasonic technology have eased this concern by replacing the single frequency wavelength approach—known to harm electronic parts—with a variable frequency approach, called “sweeping.” This advance in ultrasonic technology has not only led to reduced production costs, but has proven to enhance reliability, thus reducing warranty costs as well.

In the area of electronics, every circuit board, PCB, and electrical assembly is reliant on precision craftsmanship, with no room for imperfection. In the past, the ultrasonic cleaning of electrical components was not viable. Certain electronic components immersed in an **ultrasonic bath** would be damaged by the harmonic vibrations set up by the single-frequency ultrasonic wave. In Sweep Mode, the frequency is continuously varied slightly, eliminating the potentially damaging standing wave. Additionally, Sweep technology offers more uniform cleaning of parts by eliminating “dead zones” where no cavitation occurs in the bath. Cavitation is the formation and energy-releasing implosion of tiny vacuum-filled bubbles generated by the ultrasonic waves.

This “sweeping” technology has revolutionized the cleaning process in the electronics industry. For circuit boards, an ultrasonic circuit board cleaner helps to improve SIR test results, reduces rework, and increases reliability.
Ultrasound PCB cleaning thoroughly removes solder paste and flux residues from post-reflowed circuit assemblies.

When electronic parts are immersed in an ultrasonic cleaner, cleaning occurs wherever the liquid makes contact with the parts. Since the liquid reaches into small crevices and cavities that are impossible to clean manually, ultrasonic cleaning electrical assemblies and electronic components is an ideal approach. It's important to note that as the ultrasonic frequency increases, the size of the cavitation bubbles decreases. Consequently, higher ultrasonic frequency can penetrate smaller openings and remove tinier particles. As the size of the cavitation bubbles decreases, the energy of implosion decreases, producing gentler cleaning. This can be advantageous for cleaning very delicate surfaces, such as sensitive electronic parts. Removal of heavy contamination from durable parts is best accomplished at a lower ultrasonic frequencies. Some ultrasonic cleaners offer the operator control over the intensity of the cleaning process with user-selected ultrasonic frequency and power.

The electronics industry currently takes advantage of several advances in ultrasonic technology such as Sweep Mode, multi-frequency operation, and variable power. Ultrasonic cleaning of electronic components has become more efficient while improving product reliability, resulting in reduced warranty and replacement costs. Ultimately, the end result is lower cost for the manufacturer, technical service provider, and consumer.