

Ultrasonic Cleaner (F.A.Q.)

What Is An Ultrasonic Cleaning System

The cleaning process is carried out in the ultrasonic cleaning tank. A basket supporting the parts is lowered into the heated solution where it is exposed to the ultrasonic de-cavitation process. The immersed parts receive an ultrasonic cleaning bath through the power of the ultrasonic waves' de-cavitating action. The ultrasonic cleaning solution and the de-cavitation process work to "scrub" the part clean of oil, dirt, debris and oxidation.

How Does Ultrasonic Cleaning Work

Dirty items come clean in ultrasonic cleaning systems when millions of superheated bubbles scrub grime and oxidation away with stunning results. How? Through the process of de-cavitation.

Ultrasonic cleaning system sends high frequency sound waves ripping through an ultrasonic cleaning solution leaving superheated bubbles in the waves' wake. When these bubbles, called cavitations, collapse, called decavitation, the heat and energy of their implosions work with the specially formulated ultrasonic cleaning solution to remove dirt, oils, residue and oxidation from the surface of the contaminated item.

Imagine the ability to get into the tiniest of nooks and crannies where dirt and grime hide, and then imagine scrubbing that surface ultra clean. With conventional cleaning – brushes, rags and elbow grease – this task seems impossible. But the cavitating cleaning action of an ultrasonic cleaning system does just that – It goes where brush bristles can't.

Will Ultrasonic Cleaning Damage My Parts

Generally, ultrasonic cleaning is safe for all materials; however, prolonged exposure to ultrasonic cleaning chemicals and detergents may interact adversely with the surface of certain metals. For more information regarding the specific cautions of using particular ultrasonic cleaning solutions, and general instructions for safe use of an ultrasonic cleaning system, consult the manufacturer of the product. Aluminum with mirror like finish can lose its brilliance if immersed in an ultrasonic tank.



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Is There An Optimum Ultrasonic Cleaning Frequency

Ultrasonic cleaning systems operate in three frequency ranges: 20 to 40 Khz, 40 to 70 Khz, and 70 to 200 Khz. The system frequency to use depends on the type of cleaning required.

The 20 to 40 Khz cleaning frequency range provides relatively fast cleaning, and is suited for most industrial applications with large parts having little or no intricate detail. 20 to 40 Khz systems are good for heavy duty cleaning.

The 40 cleaning frequency range is suited for installations where parts have intricate detail, small orifices, or long tubes that need cleaning. 40Khz systems typically require more power than 20Khz systems and are slower to clean, but offer finer cleaning.

The 70 to 200 Khz cleaning frequency range is suited for specialty operations such as the fine, gentle cleaning of optics, semiconductor wafers and hard-disk-drive components.

The higher the frequency, the gentler the cleaning, while lower frequencies are designed to "scrub" heavily soiled surfaces.

What Are The Components for Ultrasonic Cavitation and Cleaning

Ultrasonic waves, heat and an ultrasonic cleaning solution are the three components at the heart of an ultrasonic cleaning system. Ultrasonic waves sonically cavitate and heat the ultrasonic cleaning solution, causing these three components work together creating an environment where dirt, grime and oxidation melt away from a dirty surface.

When the three components, ultrasonic waves, heat and ultrasonic cleaning solutions come together, ultrasonic cleaning produces jaw-dropping results. Ultrasonic cleaning is simply a superior form of cleaning that replaces hours of intensive labor and inferior cleaning results, and removes the need for flammable solvents.



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What type of Ultrasonic Cleaning Solution do I use

A mild alkaline ultrasonic cleaning solution is suited for the cleaning of oily parts. This agent works by breaking down the ionic bond that has formed between an oil and a metal. As the part is cleaned, the oil is dissolved and is dispersed into the liquid. Concentrated powders are available or soap liquid.

Are There Cleaning Solutions I Shouldn't Use In an Ultrasonic Cleaning System

You should never use flammable liquids in an ultrasonic cleaning system. Because of the heat generated by the cavitation process, dangerous conditions will occur if flammable liquids are used for ultrasonic cleaning.

Use only those ultrasonic cleaning solutions recommended by the manufacturer of the ultrasonic cleaning system. Stay away from anything acid based and rinse your part in normal water before putting it in the sonic.

Is There a Size Requirement for Ultrasonic Cleaning Systems

Ultrasonic cleaning systems are sized based on the size of the parts being cleaned. The part size determines the size of the immersion tank. The rule of thumb is to allow the tank to be one third larger than the largest part to be cleaned.

A part being cleaned should never touch the bottom of the tank. This is equivalent to placing your finger directly on the speaker of your sound system. Damage may occur.

When Should Ultrasonic Cleaning Solutions Be Changed

It is not necessary to change the ultrasonic cleaning solution for each cleaning cycle. However if there is a noticeable decrease in the effectiveness of the cleaning cycle, or if there is noticeable dirt or debris in the fluid it may be time to replenish the tank with a fresh solution.



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How Long Should an Ultrasonic Cleaning Cycle Be

There is no set amount of time or “typical” cleaning cycle. How soiled the part is, the temperature of the tank, how clean the part is to be, and the condition of the ultrasonic cleaning solution all contribute to the length of the cleaning cycle.

An experienced operator may be able to approximate the time required to clean an object, ultimately however, an inspection is required to determine if the desired state of clean has been obtained.

Should Parts Be Rinsed After An Ultrasonic Cleaning Process

Parts should be rinsed after ultrasonic cleaning to remove chemical residue from the ultrasonic cleaning solution.

Why Does An Ultrasonic Cleaner Have a Separate Heater

Ultrasonic cleaning systems typically have an external heater to keep the ultrasonic cleaning solution at the optimal cleaning temperature between cleanings. The process of cavitation provides the heat required for cleaning during the cleaning cycle.

How Can I Test an Ultrasonic Cleaning System

Most of the problems encountered with ultrasonic cleaning systems result from improper control of one or more of the cleaning variables. If you feel you have the correct cleaning heat, ultrasonic cleaning solution and operating frequency, yet think the system is not cleaning as well as it could, there are a few test you can perform: The foil test and the glass slide test.

Foil test: Cut three pieces of aluminum foil to about 4” by 8”. Fold each of the foils over a rod such as a coat hanger and suspend the foil pieces in the tank, with one piece in the center of the tank, and each of the other two at opposite ends of the tank. Be sure the tank is filled to the correct level. Turn on the ultrasonic cleaning system. In ten minutes each piece of foil should be pitted, wrinkled and degraded to the same degree.

Glass slide test: Wet a frosted piece of glass with tap water, and draw an “X” on the frosted side of the glass, corner to corner with a number two pencil. Make sure the tank is filled to the correct level with fresh ultrasonic cleaning solution. Immerse the glass into the tank and activate the system. The “X” should begin to be removed immediately, and should be gone completely from the glass within 10 seconds.

