KAIJO

PHENIX HYPER

ULTRASONIC CLEANER

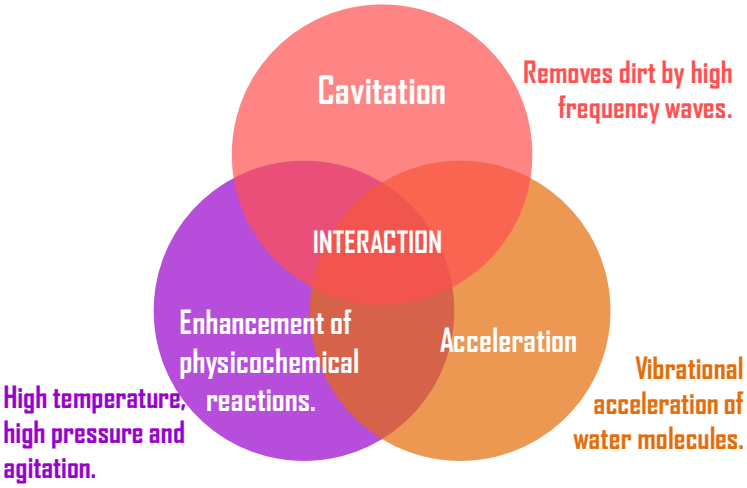
GENERAL CATALOG

KAIJO CORPORATION

KSE2019-05

KAIJO is a global leader in the field of ultrasonic cleaning and focuses on developing and advancing the ultrasonic cleaning technology.

Mechanism of Ultrasonic Cleaning



The ultrasonic cleaning performance is determined by the cross-interaction of the following three phenomena:

1. Cavitation.
2. Acceleration Force.
3. Physicochemical Reaction.

The effectiveness of the cross-interaction of these three factors varies depending on the frequency of the ultrasonic. Cavitation occurs easily at lower frequencies. However, the stronger acceleration force is produced at higher frequencies. Therefore, it is important to choose the ultrasonic cleaning equipment best fitted for your cleaning objectives.

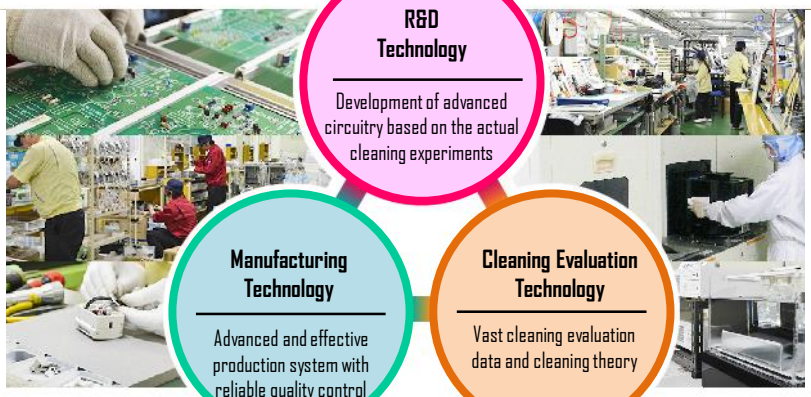
Ultrasonic Cleaning Equipment

Currently, ultrasonic technology is used in various industries to clean a wide range of products. Here are some of its main applications:

Semiconductors	Wafers, LCD, glass substrate, FPD parts, IC, FET, transistors, diodes, LED, etc.
Electronics	Printed circuit boards, crystals, electrical parts, lead frames, connectors, electrodes, pumps, motors, magnetic heads, HDD parts, etc.
Precision piece	Bearings, watch parts, camera parts, sewing machine parts, various connectors, optical devices, metal filters, etc.
Optics	Lenses, prisms, glasses, fiber optics, glass, etc.
Mechanical industry	Machining parts, bearings, steel balls, molds, tools, various valves, cylinder parts, hydraulic parts, filters, etc.
Plating	Plated parts, die cast parts, pressed parts, etc.
Automotive	Pistons, piston rings, carburetors, fuel pumps, gears, screws, electrical parts, etc.
Textile	Nozzles for synthetic fibers, filters, fabrics, etc.

Exhibition room

Technologies to support KAIJO ultrasonic cleaning equipment



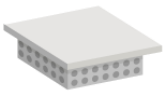
Cleaning laboratories

KAIJO products are produced based on the three advanced technologies: They are R & D Technology to design the advanced circuitry, Cleaning Evaluation Technology based on the vast cleaning data and theory and Manufacturing Technology to achieve the affective production with reliable quality control.

Types of ultrasonic transducers.

We have different types of transducers that emit ultrasound waves. Please select the one that will best fit to your requirement and applications.

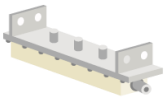
Immersion transducer
Easy to install, it is placed at the bottom of the cleaning tank.



Radiation plate
It is possible to design a smaller opening of the cleaning tank. It is usually integrated into a cleaning system.

SUS Cleaning tank
The vibration element is attached directly to the bottom of the cleaning tank. Just connect the cable to the generator and it will be ready to use.

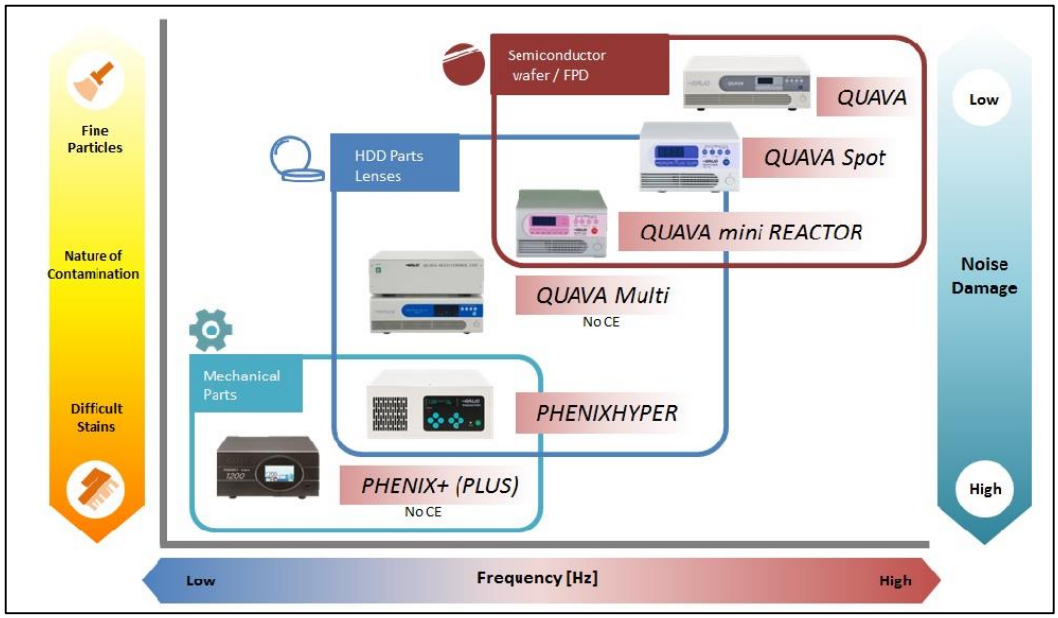
Spot shower
This is used to clean a spot area spraying cleaning solution with MEGASONIC (430 kHz to 3 MHz) from a thin nozzle. It is suitable for single plate cleaning for HDD disc, Semiconductor wafer and FPD.



Line shower
The water curtain with the MEGASONIC (950 kHz) will achieve high precision cleaning. Suitable for cleaning of FPD substrates and semiconductor wafers.

Horn type
Ultrasonic waves are emitted from the tip of the horn to remove persistent dirt.

Kaijo Ultrasonic product line covers wide frequency range.



Usually, low frequency ultrasonic generators are used to remove difficult dirt, such as oil stains. On the other hand, high frequency ultrasonic generators are used to eliminate fine particles.

KAIJO offers a wide range of ultrasonic equipment at frequencies from 19.5kHz to 3MHz for you to select the right equipment according to your cleaning purpose.

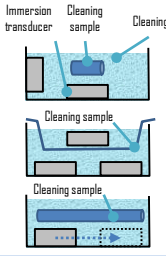
How to use the different types of transducers


Immersion transducer


Radiation plate

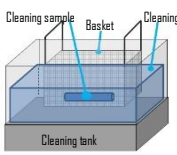

SUS Cleaning tank

Immersion transducer



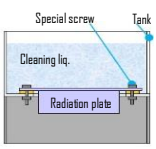
1. Ultrasonic cleaning with immersion transducer inside the tank.
2. Place the transducer on the top and bottom of the tank to clean the sample on both sides at the same time.
3. Move the transducer when cleaning a long cleaning sample.

Cleaning tank



Always use a basket to hold the parts you are cleaning. Never put the parts directly on the transducer surface (bottom of the tank).

Radiation plate



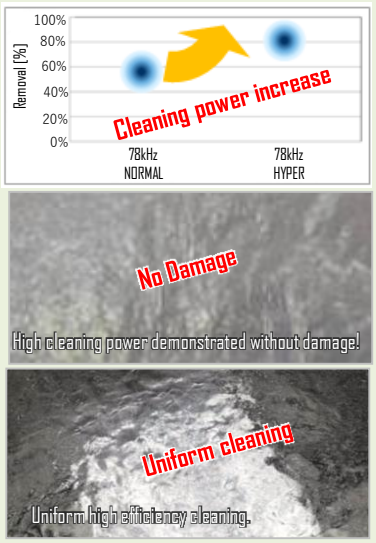
The oscillation plate is attached directly to the cleaning tank with special screws. There are different ways of installment methods depending on the application.

PHENIX HYPER

PHENIX HYPER

The "HYPER mode" increases the cleaning power, reduces possible damages to the cleaning objects, and achieves effective uniform cleaning!

- Equipped with Auto-tuning: This is the function to set the optimum operational conditions according to the current environment.
- Equipped with remote control terminals such as Remote oscillation terminals, 8 levels of output power adjustment terminals, remote interlock terminal (shutdown) and programmable timer.
- Useful output signals such as Normal oscillation signal and Alarm signal are equipped as standard function.
- Supply voltage range from AC200V to AC240V.



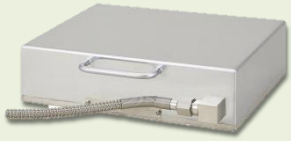
HYPER Mode Features

- Achieves high cleaning performance to remove contaminants and small particles .
- Almost no damage to the cleaning object.
- Effective cleaning for the cleaning object with complex shape.

Simple operating system

- Digital output adjustment by increments of 1 W.
- Real-time display of the active output power.
- Status and errors display.

High quality transducer



- Kaijo own-designed transducer with high cleaning performance.
- Maximum working temperature of 80° C.

Generator	75119 (CE Version)
Max. output	1200W
Frequency	78kHz
Power supply	AC200V～240V 12A (50/60 Hz)
Dimensions (mm)	350(W) × 440(D) × 165(H)
Weight	11Kg

Transducer	75225VS
Dimensions (mm)	365(W) × 280(D) × 100(H)
Weight	17 Kg

QUAVA mini Reactor

QUAVA mini REACTOR

Compact Ultrasonic cleaning set, suitable for a research environment

● **Suitable for cleaning precision parts and small substrates.**
Small tank (100mm x 100mm) requires minimum amount of cleaning fluid. Frequency range from 26kHz to 1.6MHz. Output power is viewed on a digital display.

● **Small footprint**
This small transducer and tank will hold one 500cc beaker. Various cleaning fluids can be used.

● Auto Control
No field calibration needed when replacing generator or transducer due to high functionality of QUAVA series.

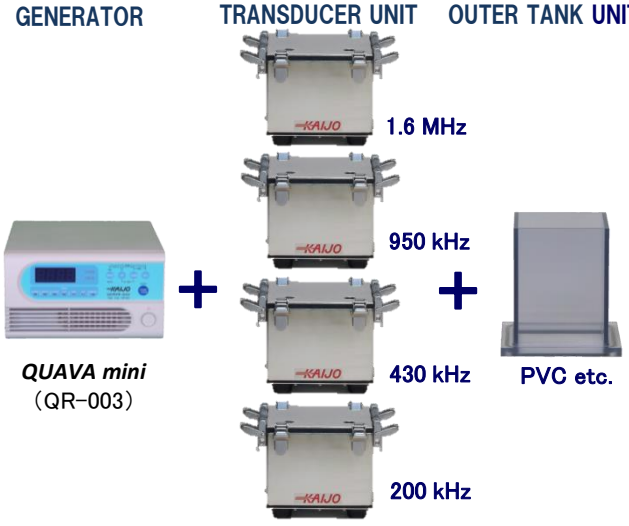
LOW FREQUENCY
26kHz～160kHz

GENERATOR | TRANSDUCER UNIT | OUTER TANK UNIT

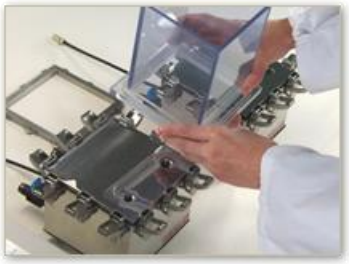
QUAVA mini
(QR-001)

HIGH FREQUENCY
200kHz～1.6MHz

GENERATOR | TRANSDUCER UNIT | OUTER TANK UNIT



QUAVA mini
(QR-003)



Outer tank unit and transducer are easily replaced.

The tank is made of clear PVC or stainless steel.

Generator	Low frequency	High frequency
Model	30110 (QR-021CE)	30110 (QR-023CE)
Frequency	26kHz・78kHz・130kHz or 38kHz・100kHz・160kHz	200kHz ・430kHz ・950kHz ・1.6MHz
Output	1 - 100W	1 - 100W
Output Adjustment	0.1W	
Power supply	AC100V±10%-240V±10% Single phase 50/60Hz	
Dimensions	218(W) × 258(D) × 138(H) mm	

Transducer	26・78・130kHz	38・100・160kHz	200kHz	430kHz	950kHz	1.6MHz
Input	50W	50W	100W	100W	100W	100W
Tank model	30201VS	30301VS	30600S	30700S	30800S	30900S

Tank	PVC	PVC Hose connector	PVC (Valve)	PVC O/F	SUS
Model	3266412	3265088	3266413	3266414	3266415
Outer dimensions	□138×150 (H) mm	□138×150 (H) mm	□138×150 (H) mm	138(W) × 165(D) ×150(H) mm	□138×150 (H) mm
Tank dimensions	□100×150 (H) mm	□100×150 (H) mm	□100×150 (H) mm	□100×150 (H) mm	□107×150 (H) mm
Hose diameter	---	∅10mm × 2	∅9mm × 2	∅9 ・ ∅12mm × 1	---
Appearance					

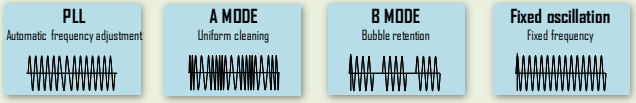
QUAVA

MEGASONIC GENERATOR

QUAVA is a high performance ultrasonic generator designed for precise cleaning for semi-conductor wafers, FPD, HDD components and etc.

- Output power can be always monitored and controlled by remote control function.
- Output power is adjustable with 1W interval from 100W to 1200W and 0.1W interval from 10W to 100W to achieve the optimum cleaning performance.
- Soft start and soft stop functions and 4 different oscillation modes will enables to achieve high performance and damageless cleaning at the same time.

Four selectable oscillation modes!



Generator	70110 (QS-020CE)
Max. Output	1200W
Min. Output	10W
Output adjustment unit	10W-100W : Increments of 0.1W, 100W-1200W : Increments of 1W
Available frequencies	430kHz /750kHz / 950kHz ±7%
Oscillation mode	PLL/Fixed/A MODE/B MODE
Frequency Control	Automatic tracking PLL system
Power supply	AC200V±10%-240V±10% 10A Single phase 50/60Hz
Communications	Remote Control Mode - 8 step output, RS485, Device Net. Monitoring function- Analog Output 0-5V(Standard setting) or 4-20mA
Dimensions	430(W) × 418(D) × 148(H) mm
Weight	17Kg

MEGASONIC TRANSDUCERS 750kHz 950kHz

- Provide precise cleaning of particles of less than 0.2μm.
- Suitable for cleaning of damage sensitive object such as semiconductor wafer.

MODEL	7857S	8857S	98S	98SL
Input	1200W	1800W	4800W	4800W
Frequency	950kHz			750kHz
Radiation surface	136 × 163 mm	165 × 215 mm	273 × 327 mm	275 × 319 mm
Material	SUS316L			
Max. temperature	70° C			
External dimensions	185(W)×215(D)×55(H) mm	255(W)×305(D)×55(H) mm	390(W)×370(D)×55(H) mm	410(W)×340(D)×65(H) mm
Wafer holder	150mm	200mm	300mm	300mm

MID SONIC TRANSDUCERS 430kHz

- Ideal for precise cleaning
- Minimum damage to aluminum parts or LCD glasses

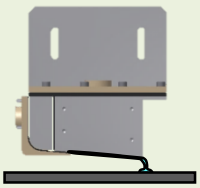
MODEL	6657Ti	7657Ti	67S	77S
Input	430W	860W	600W	1200W
Frequency	200kHz		430kHz	
Radiation surface	121 × 200 mm	200 × 250 mm	77 × 200 mm	155 × 200 mm
Material	Titanium		SUS316L	
Transducer	PZT			
Max. temperature	70° C			
External dimensions	215(W)×275(D)×56(H) mm	275(W)×355(D)×56(H) mm	175(W)×275(D)×56(H) mm	250(W)×275(D)×56(H) mm

US SHOWER AD 950kHz

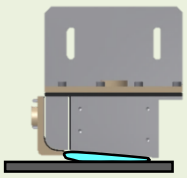
This Ultrasonic Shower AD will be used in combination with the QUAVA generator.

- New cleaning method to achieve high performance cleaning
- Low water consumption is achieved.
- Error prevention method is equipped to stop Ultrasonic emission when water is not running.

Two cleaning modes



Shower mode



Liquid contact mode

MODEL	58S(317)	68S(529)	78S(741)	78S(953)	88S(1165)	88S(1377)	88S(1589)	88S(2013)	98S(2331)
Input	360W	600W	840W	1080W	1320W	1560W	1800W	2280W	2640W
Frequency	950kHz								
Generator	1 unit	1 unit	1 unit	2 units	2 units	2 units	2 units	3 units	3 units
Water required	11-14ℓ/min	16-20ℓ/min	25-30ℓ/min	28-35ℓ/min	46-50ℓ/min	50-55ℓ/min	50-60ℓ/min	75-85ℓ/min	~100ℓ/min
Max. temperature	50° C								

Please contact us for detailed specifications.

Spot shower

QUAVA Spot

QUAVA Spot Shower is designed for superfine cleaning of HDD Media, FPD glass and Semiconductor wafers.

QUAVA Spot Generators

QUAVA Spot
430kHz 950kHz

QUAVA Spot
2MHz 3MHz

Generator	3011 (QT-023CE)	29110 (QT-021CE)
Max. Output	100W	50W
Min. Output	1W	
Adjustment	0.1W	
Frequency	430kHz, 950kHz	2MHz, 3MHz
Oscillation Mode	PLL MODE, A MODE	
Frequency Control	Automatic Tracking PLL system	
Power Supply	AC100V -240V 250VA single phase 50/60Hz	
Communication	Remote Terminal, RS-485, DeviceNet	
Dimensions	218(W)×258(D)×138(H) mm	

- Communication with host computer is available. Equipped functions are output power control, operation status monitoring and error report and etc.
- No generator calibration is needed when replacing the transducer.
- Output power control can be set in 0.1 watt increments.

Please contact us for detailed specifications.

Transducer: Mega tube

430kHz 950kHz

This picture shows the transducer with PCTFE housing

- The cleaning liquid containing ultrasonic energy will be sprayed from the end of the quarts tube.
- The longer tube allows the user to access directly to the surface of the cleaning object.
- The shape and the length of the tube can be customized in accordance with customer requirements.

Transducer	27222	17222	28222
Input	50W	20W	30W
Generator	3011 (QT-023CE)		
Frequency	430kHz		950kHz
Housing material	PEEK*		
Oscillation plate material	Ta		
Temperature Range	15° – 40° C		
Liquid Consumption	2.0-3.5ℓ/min	1.0-2.0ℓ/min	1.0-1.5ℓ/min
Dimensions	∅57×90(H) mm	∅36×71(H) mm	

**Available in PCTFE.*

Please contact us for detailed specifications.

Transducer: Spot Shower

430kHz 950kHz 2MHz 3MHz

- 430kHz, 950kHz, 2MHz and 3MHz spot shower transducers are available. The effective and uniform cleaning is achievable with minimal damages to the fragile surface of the cleaning objects.
- Nozzle portion is made of high purity quartz for a high precision cleaning. Also nozzles made of stainless steel are available.

Transducer	27220	17220	28220	29220	29220H
Input	50W	20W	30W	30W	30W
Generator	3011 (QT-023CE)			29110 (QT-021CE)	
Frequency	430kHz		950kHz	2MHz	3MHz
Housing material	PEEK*				
Oscillation plate material	Ta				
Temperature Range	15° – 40° C				
Liquid Consumption	2.0-3.5ℓ/min	1.0-2.0ℓ/min	1.0-1.5ℓ/min	1.0-1.5ℓ/min	1.0-1.5ℓ/min
Dimensions	∅57×90(H) mm	∅36×71(H) mm			

**Available in PCTFE.*

For over 70 years KAIJO has been a global leader in developing ultrasonic cleaning technology for use in industrial applications. We provide a full line of ultrasonic cleaning systems that include high performance ultrasonic cleaners to ultra high purity semiconductor processing systems. In addition to providing ultrasonic cleaning equipment, we also focus on helping our clients improve the overall performance of their cleaning processes. We seek to develop and maintain long term customer relationships by providing outstanding customer support and service.

Kaijo sincerely hope that customers will find an effective solution using Kaijo products to achieve high cleaning performance and reduce the operating cost such as less usage of water, cleaning agent and electric power.

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