

SONICATOR®



Ultrasonic Liquid Processors

QSONICA
SONICATORS

Q700 Sonicator

The new Q700 is the most technologically advanced sonicator available today. A state-of-the-art touch screen interface offers intuitive control and provides a user-friendly experience. The most important feature of a Sonicator is reproducibility. Improved internal circuitry guarantees more efficient operation, sample-to-sample consistency and most importantly, a reliable end result.

The Q700 is the only sonicator on the market that offers full amplitude control from 1-100%. This enables greater control of the probe's intensity, helping to pinpoint the optimum settings for efficient sample processing. We have increased maximum power output to 700 watts making the system more durable and capable of handling even larger samples if necessary. Our new display, design improvements and added accessories make this the most sophisticated and versatile Sonicator available today.



Stand sold separately.

FEATURES:

FULL AMPLITUDE CONTROL

Amplitude (intensity) is controlled from 1-100% giving a greater degree of resolution and the ability to pinpoint the amplitude needed to effectively process your sample.

PROGRAMMABILITY

Parameters including processing times, pulse on/off and amplitude can be saved to memory and run by the touch of a button.

PULSE MODE

Adjustable pulse On and Off times to reduce the heat gain in temperature sensitive samples.

TEMPERATURE MONITORING

An optional temperature probe is available for those customers who wish to monitor the temperature of their sample. If the temperature limit is reached, sonication shuts down to prevent overheating.

RoHS COMPLIANT

All Qsonica equipment is built lead free.

RUN MULTIPLE PROGRAMS IN SEQUENCE

Multiple programs can be run in sequence. For example, the unit can be programmed to sonicate at 50% amplitude for 5 minutes, shut off for 2 minutes and re-start at 25% amplitude for 10 minutes. Up to 5 programs can be run in succession.

TOTAL ENERGY OUTPUT DISPLAY

Energy delivered to the probe is displayed in both Watts and Joules.

AUTO TUNING

The Sonicator digitally tracks frequency changes in the converter / tip assembly caused by load and temperature changes and maintains electrical efficiency at all times. Manual tuning is unnecessary.

OVERLOAD PROTECTION

The unit is equipped with fault detection circuitry to shut down sonication in the event that a fault occurs.

TOUCH SCREEN CONTROL

A large, color LCD screen clearly displays all operating parameters and options. Intuitively and quickly access any of the sonicator's functions with a simple touch.



PART NO. Q700 INCLUDES:

- Generator
- Converter
- 1/2" (13mm) diameter probe
- Power cable
- Converter cable
- Wrench set

TECHNICAL SPECIFICATIONS:

Power Rating:	700 watts
Frequency:	20kHz
Programmability:	10 memories plus sequencing
Programmable Timer:	72 hours
Adjustable Pulse On/Off:	1 second to 24 hours
Dimensions (W x L x H):	8 x 15.25 x 8.5 in. (203 x 387 x 216 mm)
Voltage:	110V, 50/60Hz

Specify desired voltage for export.

Horns (also known as probes) are made from titanium and machined to specific sizes and shapes. When driven at their resonant frequency, they expand and contract longitudinally. This mechanical vibration is amplified and transmitted down the length of the probe. In liquid, the probe causes cavitation which constitutes the main mechanism for sample processing.

Choosing the appropriate horn is extremely important. The sample volume to be processed is directly related to the tip diameter. Smaller tip diameters (Microtip probes) deliver high intensity sonication, but the energy is focused within a small, concentrated area. Larger tip diameters can process larger volumes, but offer lower intensity. Probes are offered with replaceable or solid tips.

Probe tips will pit or erode over time and require replacement. Replaceable tip probes are used with aqueous samples only. In addition to aqueous samples, solid probes can be used with organic solvents, alcohols and low surface tension liquids. Contact Qsonica with questions regarding proper tip selection.



Standard Probes



Part #	Type of Tip	Processing Volume	Tip Diameter	Amplitude (microns)
4220	Replaceable Tip	20-250mL	1/2" (13mm)	120µm
4219	Solid Tip	20-250mL	1/2" (13mm)	120µm
4207	Replaceable Tip	50-500mL	3/4" (19mm)	60µm
4208	Solid Tip	50-500mL	3/4" (19mm)	60µm
4210	Replaceable Tip	100-1,000mL	1" (25mm)	30µm
4209	Solid Tip	100-1,000mL	1" (25mm)	30µm

Note: All amplitude values are measured at 100% output.

Replaceable

Solid

Replacement Tips for Standard Probes

Standard 1/2", 3/4" and 1" horns have replaceable tips. During normal use, tips erode and become less effective over time. These worn tips can be easily removed and replaced.



Part #	Tip Diameter	For Use With
4406	1/2" (13mm)	#4220
4407	3/4" (19mm)	#4207
4408	1" (25mm)	#4210



New Tip

Worn Tip

Microtip Probes

Microtips are thin, high intensity probes which are designed for processing small sample volumes. Microtips screw into the threaded end of the standard 1/2" probe (#4220).



Part #	Processing Volume*	Tip Diameter	Amplitude (microns)
4417	0.2-5mL	1/16" (2mm)	320µm
4418	1-15mL	1/8" (3mm)	380µm
4420	10-50mL	1/4" (6mm)	200µm

* The recommended processing volume range is application specific. For example, samples containing surfactants foam easily and may require larger volumes for effective sonication. Contact Qsonica for application assistance.



Coupler with Stepped Microtip

The stepped microtip and coupler assembly is a low intensity option which can be used to process small volumes that do not require high power. The probe tip remains 1/8" diameter for 48mm. This 2-piece assembly attaches directly to the converter.



Part #	Processing Volume	Tip Diameter	Amplitude (microns)
4422*	0.5-15mL	1/8" (3mm)	200µm
4421	Coupler - *required for use of a Stepped Microtip		

Extenders

Extenders attach to standard probes of the same tip diameter and extend the length of the probe assembly to reach down into tall vessels.



Part #	Type of Tip	Length	Tip Diameter
406HW	Solid Tip	5"	1/2" (13mm)
406HWT	Replaceable Tip	5"	1/2" (13mm)
407HW	Solid Tip	5"	3/4" (19mm)
407HWT	Replaceable Tip	5"	3/4" (19mm)
408HW	Solid Tip	5"	1" (25mm)
408HWT	Replaceable Tip	5"	1" (25mm)
407FW	Solid Tip	10"	3/4" (19mm)
407FWT	Replaceable Tip	10"	3/4" (19mm)
408FW	Solid Tip	10"	1" (25mm)
408FWT	Replaceable Tip	10"	1" (25mm)

Booster

A booster (#4121TI) attaches between the converter and a standard 3/4" or 1" probe. The booster will double the amplitude of the probe.



Part #	For Use With	Gain Ratio
4121TI	3/4" (13mm) and 1" (25mm) Probes	2 to 1

High Gain Probes

High gain probes offer double the amplitude of standard 3/4" and 1" probes. These probes attach directly to the converter and are available with solid or replaceable tips.



Part #	Type of Tip	Processing Volume	Tip Diameter	Amplitude (microns)
4305	Replaceable Tip	50-500mL	3/4" (19mm)	120µm
4306	Solid Tip	50-500mL	3/4" (19mm)	120µm
4310	Solid Tip	100-1,000mL	1" (25mm)	60µm
4311	Replaceable Tip	100-1,000mL	1" (25mm)	60µm

4 Tip Horns

The 4 Tip Horn enables 4 samples to be processed simultaneously. This horn is effective for cell disruption, mixing, homogenization and many other applications. This horn is available with either 1/8" or 1/4" tip diameters.

#4659 is a 4 Tip Horn with 1/8" tips. It is recommended for 1-15ml volumes and fits into both 1.5ml and 15ml tubes. The space between each tip is 1.05". The #504 and #510 Coolracks are compatible with #4659.

#4674 is a 4 Tip Horn with 1/4" tips. It is recommended for 10-50ml volumes and is used with 15 and 50ml tubes. The space between each tip is 1.6". The #511 Coolrack is compatible with the #4674.



The #4130 Stand with Lab Jack is recommended for use with all high throughput horns. This stand holds the horn stable and level to ensure consistent results.

24 Tip Horn

The 24 Tip Horn processes each well of a 24 well plate at the same time. This horn is effective for cell disruption, mixing, dissolution and many other applications. The distance between each tip is .708".



#4579

Dual Horn

The Dual Horn allows a single Sonicator unit to process two samples simultaneously. Two standard probes are attached to a rectangular shaped horn. The distance from center to center of each probe is 4.5". 3/4" solid tip probes are included with the Dual Horn but 1/2" or 1" probes can also be substituted.



#4525



#432B2
(Probe sold separately.)

Part #	Description
432B2	Sound Enclosure with Converter Holder, Exterior Dimensions (W x H x D) 13.5 x 30.5 x 13 in. (343 x 775 x 330 mm)

Sound Enclosure

Sonicators are extremely loud devices and will cause discomfort to the user and anyone nearby. The Sound Enclosure reduces noise by approximately 20 dBA and is made to work with all accessories (excluding the Microplate Horn which has its own dedicated enclosure).

In addition to reducing noise, the Sound Enclosure has an internal support rod and converter mounting system. Any Qsonica probe or horn will be held safely and securely inside the unit.

Two ports are located on either side of the enclosure for coolant tubing or a temperature monitoring probe. The interior walls are lined with acoustic foam and the door has a window so experiments can be visually monitored.



#432B2
(Cup Horn sold separately.)

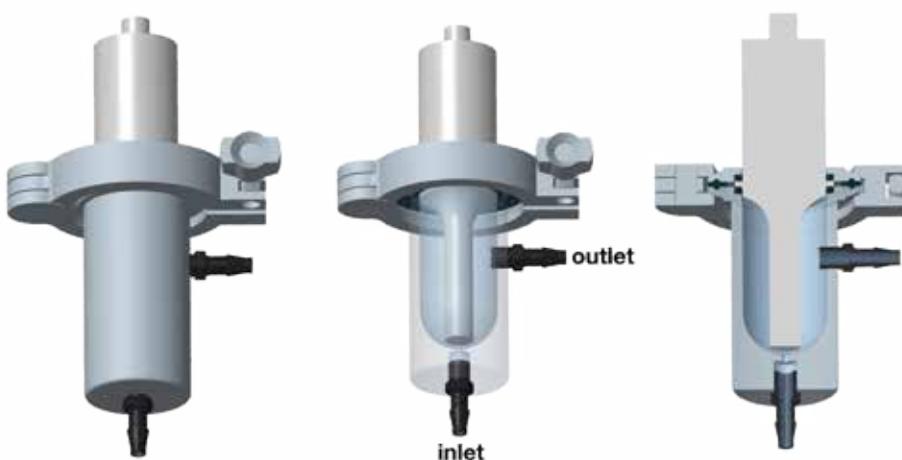
Low Volume Flocells

The Low Volume Flocell (LVF) is available for use with either the Q500 or Q700 system. The Flocell (#4650) is equipped with $\frac{1}{4}$ " (6mm) hose barb fittings and does not include a probe. A $\frac{1}{2}$ " (13mm) replaceable tip probe (#4643) or $\frac{1}{2}$ " (13mm) solid probe (#4644) must be ordered separately. The replaceable tip probe is for use with aqueous samples only. Solid tip probes can be used with all types of solvents or low surface tension liquids. Each probe features a flange for proper mounting into the LVF.

Sonication generates heat so cooling the system is important. The LVF can be ordered with a water jacket preassembled (#4653) to assist in cooling both the sample and the probe. The removable water jacket fits securely over the Flocell body and recirculates cold water around the exterior. The water jacket includes $\frac{1}{4}$ " (6mm) hose barb fittings. An optional water jacket attachment (#4655) can be added to an older model LVF if needed.

The LVF is recommended for processing sample volumes above 1L. Routine applications include cell lysis, mixing, solubilizing and deagglomerating/dispersing nanoparticles.

A peristaltic pump and associated tubing are not included. A variable speed pump is recommended and the customer must make a selection based on their particular product requirements.



Part #	Description
4650	Low Volume Flocell <ul style="list-style-type: none"> • Material: 316L Stainless Steel • Operating pressure: 40 psi max. • Internal volume: 65mL • Maximum flow rate: 0.5L/min • Hose barb fittings for $\frac{1}{4}$" (6mm) ID tubing • Dimensions (L x W): 9.1 x 3.5 in. (228 x 89 mm) — dimensions include probe and clamp
4653	4650 LVF with Water Jacket
4643	$\frac{1}{2}$" (13mm) Replaceable tip probe with flange for #4650
4644	$\frac{1}{2}$" (13mm) Solid tip probe with flange for #4650
4655	Water Jacket for #4650

How Flocells Work

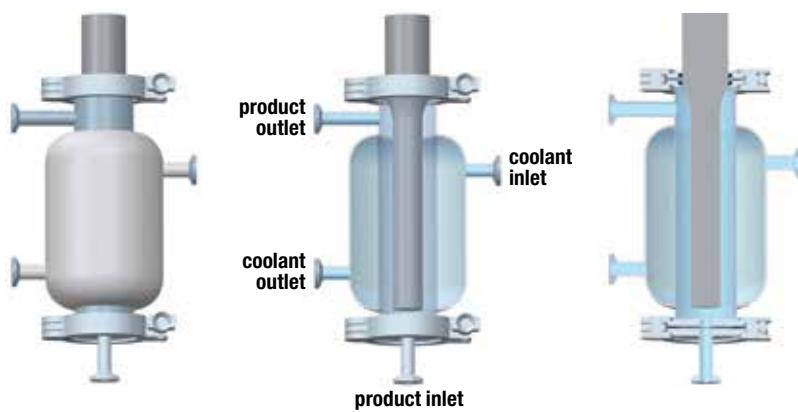
Flocells offer inline or continuous, large volume, batch sample processing. Flocells are ideal for mixing and dispersing applications. Batch volumes can be recirculated through the system multiple times if increased sonication time is needed. Multiple units can be used in series to reduce processing time and/or maintain an even higher flow rate.

The liquid sample is pumped into the Flocell through the inlet at the bottom of the unit. As the sample passes through the cavitation field, it is processed. The processed liquid exits the unit through an outlet port. The degree of processing can be controlled by adjusting the intensity of sonication as well as flow rate.

High Volume Flocells

The High Volume Flocell (HVF) is available for use with either the Q700 or Q1375 System. The Flocell (#4549) is equipped with 1/2" (13mm) sanitary connections, a water jacket and 1" (25mm) Diameter probe (#4625). The water jacket can be used to recirculate cold water around the exterior of the Flocell body. This helps reduce the heat generated during ultrasonic processing.

The HVF is recommended for processing batch volumes of 5L or more. Routine applications include cell lysis, mixing, solubilizing and deagglomerating/ dispersing nanoparticles.



Part #	Description
4549	High Volume Flocell <ul style="list-style-type: none"> • Dimensions (H x D): 17 x 16 in. (431 x 406 mm) • Includes #4625 Probe • Material: 316L Stainless Steel • Operating pressure: up to 100psi • 1/2" (13mm) Sanitary connections • Internal volume: 400mL • Maximum flow rate: 20L/min • Water jacketed for cooling
4625	1" (25mm) Diameter Flocell Probe

Cup Horn

A Cup Horn offers indirect sonication and functions as a high intensity ultrasonic water bath. Multiple samples can be processed in sealed tubes eliminating cross contamination or aerosol issues.

The horn is mounted within an acrylic cup and the cup is filled with water. Sample tubes are placed in a rack at a fixed distance above the ultrasonic horn. Cavitation is produced in the water, processing the samples within the tubes. The #440 tube rack is included with the Cup Horn. This rack is made for 1.5mL polystyrene tubes which are proven to process samples more efficiently than 1.5mL polypropylene tubes.

Sonication generates heat so ports for cooling are located on each side of the cup. The #4905 Chiller is recommended for maintaining both the water temperature and water level within the Cup Horn.

The Sound Enclosure is highly recommended for all Cup Horn users. In addition to reducing sonication noise to safe levels, it securely holds the Cup Horn in place. Custom tube racks are available. Contact Qsonica for application assistance.



#431C2

Optional Tube Racks



#440



#451



#449



#445



#455



#454

Part #	Tube Holder Description
440	8 x 1.5mL Polystyrene tubes
451	8 x 1.5mL Polypropylene tubes
449	12 x 500µl PCR tubes
445	24 x 200µl PCR tubes
455	1 x 50mL tube
454	1 x 15mL tube



Microplate Horn

(Only for use with Q700)

Similar to a Cup Horn, but larger, the Microplate Horn (MPH) is an indirect sonication device capable of processing an entire 96 well microtiter plate or many microtubes at one time.

Place your samples into the water-filled reservoir and ultrasonic energy is transferred into each individual well or tube. Popular applications include cell lysis, dissolution, homogenization and PMCA.

The MPH generates heat and requires cooling. The #4905 Chiller is recommended to cool the MPH and maintain a specific water level inside the reservoir.



#Q700MPXC



#431MPXH

Part #	Description
Q700MPXC	Q700MPX system and chiller package
Q700MPX	Q700 system, MPH and enclosure
431MPX	Microplate horn and enclosure
431MPXH	Microplate horn only
432B2MP	Sound enclosure with stand
447	Microplate holder
4268	1.5mL tube holder with cover
444	300ul tube holder with cover

Note: the Q700MPX does not include a standard 1/2" probe.



#447



#4268



#444

Recirculating Chiller

Sonication generates heat which is detrimental to most applications. Attempting to control temperature with ice can be tedious and problematic. Qsonica Chillers simplify and automate the sample cooling process.

The Chiller does not have an internal reservoir to hold water. It will circulate and cool the water held within a Cup Horn, Microplate Horn or other vessel without affecting the water level. Quick-connect tubing and fittings (ordered separately) attach the Chiller to ports on the Cup Horn or Microplate Horn.

The Chiller is often used in conjunction with the pulsed sonication mode which will further reduce sample temperature. Older model Cup Horns or various sample containers may require special fittings so please contact us for ordering assistance.



Chiller shown with Sonicator, tubing set, Cup Horn and Sound Enclosure (sold separately).

Part #	Description
4905	High-Capacity Recirculating Chiller
4911	Tubing/Connector Set for Cup Horn
4916	Tubing/Connector Set for Microplate Horn
4933	Replacement Filter

TECHNICAL SPECIFICATIONS:

Cooling Capacity: 400 watts

Temperature Range: 5-45° C

Dimensions: 13 x 11 x 13 in. (32 x 28 x 32 cm)

Weight: 28 lbs. (12.7kg.)

Voltage: 115-230 VAC, 50/60 Hz

Replacement Converter

Part #	Description
CL334	Replacement Converter

Replacement Wrenches

Part #	Description
404	Wrench Set

Part #	Description
4015	Heavy Duty Pin Spanner

**Temperature Monitoring Options**

(Q700 only)

Part #	Description
4103	Flexible Thermocouple

2 types of temperature probes are available for use with the Q700 Sonicator



Part #	Description
4102	Temperature Probe

Replacement Converter Cable

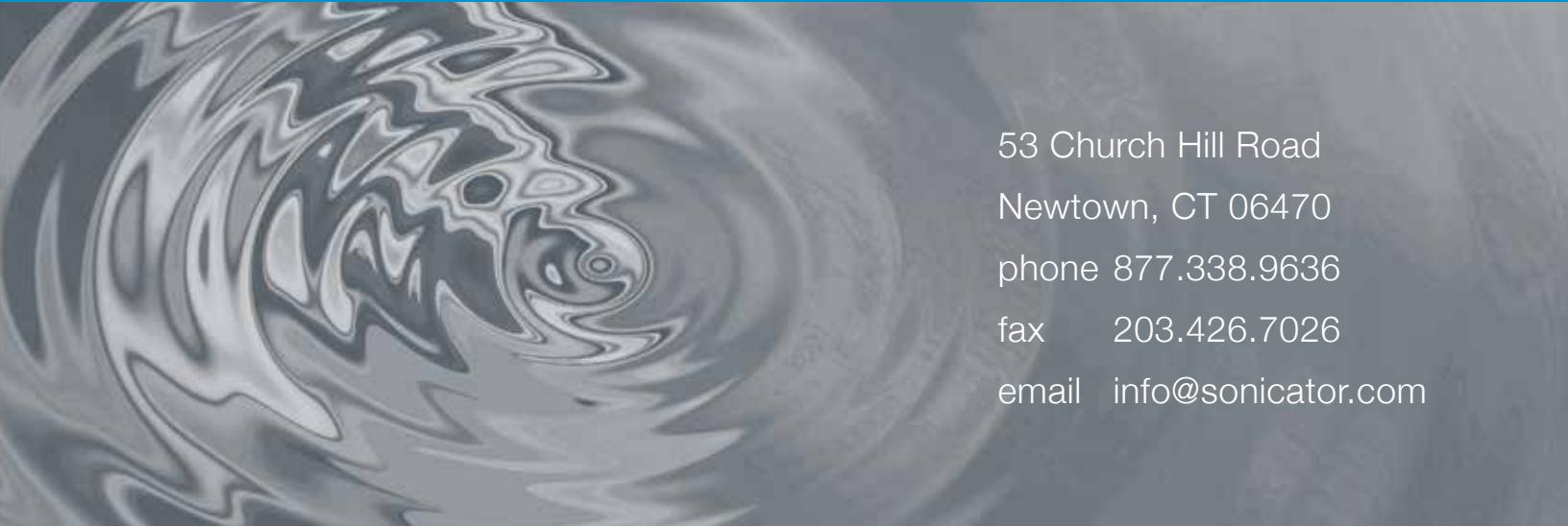
Part #	Description
K4	6 ft. Long
K4-10	10 ft. Long

Footswitch

Enables hands free operation

Part #	Description
FS-3	For Use with Q700
4004	For Use with Q500

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