ACCESSORIES FOR 750 AND 500 WATT SYSTEMS

PROBES

Probes (sometimes referred to as horns) are attachments that act as mechanical amplifiers to increase the amplitude of vibration generated by the converter.

TIP DIAMETER
1/2" (13mm)

PART NO.
630-0220
Threaded End

630-0219
Solid

VOLUME
50-250mL

AMPLITUDE
115µm

TIP DIAMETER
3/4" (19mm)

PART NO.
630-0207
Threaded End

630-0208
Solid

VOLUME
100-500mL

AMPLITUDE
60µm

TIP DIAMETER
1" (25mm)

PART NO.
630-0210
Threaded End

630-0209
Solid

VOLUME
200-1,000mL

AMPLITUDE
35µm

When driven at its resonant frequency, the probe expands and contracts longitudinally about its center. The distance the probe moves is measured as the amplitude. The greater the mass ratio between the upper section and the lower section, the greater the amplification factor, and the greater the peak-to-peak excursion at the tip of the probe. The amplitude setting can be adjusted on the power supply.

Probes with smaller tip diameters produce greater intensity of cavitation, but the energy released is restricted to a narrower, more concentrated field. Conversely, probes with larger tip diameters produce less intensity, but the energy is released over a greater area. The larger the tip diameter, the larger the volume that can be processed, but at lower intensity.

High gain probes produce higher intensity than standard probes of the same diameter and are recommended for processing difficult samples. Probes are fabricated from a high-grade titanium alloy (Ti-6Al-4V) because of its high tensile strength, good acoustical properties at ultrasonic frequencies, high resistance to corrosion, low toxicity and excellent resistance to cavitation erosion. They are autoclavable and available with threaded ends to accept replaceable tips, microtips and extenders. Probe tips will pit or erode over time and will need to be replaced. Replaceable tip probes are used with aqueous samples only. Solid probes can be used with all sample types including aqueous samples, organic solvents and low surface tension liquids. Contact Sonics for help selecting the proper probe or tip.

REPLACEABLE TIPS

Standard ½", ¾" and 1" probes are available with replaceable tips for use with water based samples. During use, tips erode and become less effective over time. A worn tip is easily removed and replaced.

PART NO.
630-0406

TIP DIAMETER
½" (13mm)

PART NO.
630-0407

TIP DIAMETER
¾" (19mm)

PART NO.
630-0408

TIP DIAMETER
1" (25mm)

TAPERED MICROTIPS

Two types of microtips are available to enable processing of samples in small vessels or tubes – a tapered microtip and a stepped microtip. The tapered microtip screws into the threaded end of the standard ½" (13 mm) probe in place of the replaceable tip. This combination is capable of generating very high amplitudes.

TIP DIAMETER
1/16" (2mm)

PART NO.
630-0417

VOLUME
0.2-5mL

MAX AMPLITUDE %
40

AMPLITUDE
170µm

TIP DIAMETER
1/8" (3mm)

PART NO.
630-0418

VOLUME
1-15mL

MAX AMPLITUDE %
40

AMPLITUDE
200µm

TIP DIAMETER
3/16" (5mm)

PART NO.
630-0419

VOLUME
5-20mL

MAX AMPLITUDE %
65

AMPLITUDE
210µm

TIP DIAMETER
1/4" (6mm)

PART NO.
630-0420

VOLUME
10-50mL

MAX AMPLITUDE %
75

AMPLITUDE
180µm

Tapered microtips attach to standard ½" probe (#630-0220).

CAUTION: Do not exceed the maximum amplitude limits. Operating above the limit may cause the microtip to fracture. Do not use a tapered microtip with a coupler.

STEPPED MICROTIPS

The stepped microtip assembly consists of two parts, the coupler and the microtip. The coupler screws into the converter in place of the standard probe and due to the reduced diameter, it is capable of reaching into narrow, long necked vessels. The stepped microtip assembly can deliver lower amplitudes and is advantageous when processing samples under 1mL.

COUPLER

PART NO.
630-0421

TIP DIAMETER
1/16" (2mm)

PART NO.
630-0423

VOLUME
0.2-5mL

MAX AMPLITUDE %
40

AMPLITUDE
110µm

TIP DIAMETER
1/8" (3mm)

PART NO.
630-0422

VOLUME
1-15mL

MAX AMPLITUDE %
40

AMPLITUDE
110µm

TIP DIAMETER
1/4" (6mm)

PART NO.
630-0435

VOLUME
10-50mL

MAX AMPLITUDE %
40

AMPLITUDE
80µm

Stepped microtips attach to the coupler (#630-0421).

EXTENDERS

Extenders screw into threaded end probes of the identical diameter in place of the replaceable tip. Extenders are recommended when working with tall, narrow vessels such as Erlenmeyer flasks and add 5" of length to a standard probe.

PART NO.
630-0410

SIZE
½" (13 mm) diameter
5" (127 mm) long.

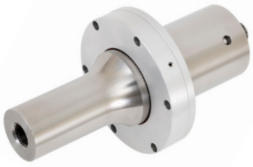
PART NO.
630-0409

SIZE
¾" (19 mm) diameter
5" (127 mm) long

PART NO.
630-0444

SIZE
1" (25 mm) diameter
5" (127 mm) long

Longer extenders are available upon request.



PART NO.
BHN294T21

BOOSTER

When connected between the converter and the probe, the booster acts as a mechanical amplifier that increases the amplitude of vibration by a factor or 2. The booster is compatible with the ¾" and 1" standard probes. Boosters cannot be used with ½" probes.

HIGH GAIN PROBES

High gain probes offer twice the amplitude when compared to standard probes of the same diameter and attach directly to the converter. High gain probes are not compatible with boosters.

TIP DIAMETER
¾" (19mm)

PART NO.
630-0306

TYPE
Solid

VOLUME
100-500mL

AMPLITUDE
115µm

TIP DIAMETER
1" (25mm)

PART NO.
630-0310

TYPE
Solid

VOLUME
200-1,000mL

AMPLITUDE
65µm

DUAL PROBE

The dual probe assembly enables a single ultrasonic processor to process two (25-500 mL) samples simultaneously. The assembly consists of an aluminum primary horn **PART NO. 630-0562** and two ¾" (19 mm) solid probes **PART NO. 630-0208**. Center to center dimension between the probes is 4 ½" (114 mm).

When used with a 750 watt ultrasonic processor, the dual probe is capable of delivering up to 375 watts per probe, meeting all EPA requirements specified in SW-846 method 3550.

PART NO.
630-0525

MULTI-ELEMENT PROBES

The high throughput multi-element probes increase productivity and minimize repetitive tasks by processing numerous samples simultaneously. Units are available with 4, 8 and 24 tips and are compatible with either the 500 or 750 watt systems. Custom formatted multi-element probes are available upon request.

4-ELEMENT

PART NO.
630-0559

8-ELEMENT

PART NO.
630-0586

16-ELEMENT

PART NO.
630-0699

24-ELEMENT

PART NO.
630-0579

TIP DIAMETER
1/8" (3mm)

VOLUME
0.5-15mL

AMPLITUDE
120µm

PART NO.
830-00427

SOUND ABATING ENCLOSURE

Ultrasonic processing produces high pitched noise, which originates from the vessel walls and the liquid surface. The sound enclosure reduces the noise to comfortable levels. A support rod and converter clamp are included. Access ports are available on both sides and the top of the enclosure.

OUTSIDE DIMENSIONS:
(H x W x D) 30.5" x 13.5" x 13"
(775 x 343 x 330 mm)

INSIDE DIMENSIONS:
(H x W x D) 29" x 12.5" x 12"
(737 x 318 x 305 mm)

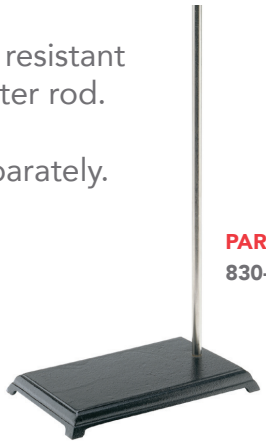
SUPPORT STAND WITH CLAMP

Securely support the ultrasonic processor with a chemically resistant plastic holder on a 5.5" x 9" cast-iron base with 0.5" diameter rod.

The converter clamp and support stand can be ordered separately.

PART NO.
830-00459

PART NO.
830-00116

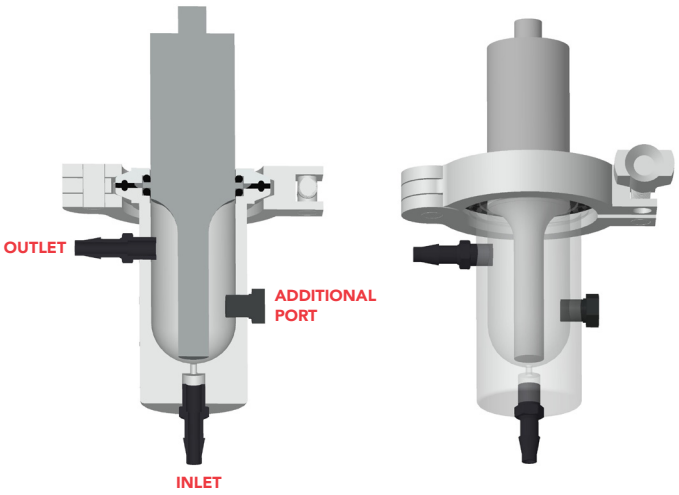


PART NO.
830-00109

MEDIUM VOLUME CONTINUOUS FLOW CELL

The flow cell enables continuous processing of 1L or greater volumes. The unit is made of 316L stainless steel and has ¼" (6mm) hose barb fittings. Maximum flow rate is 0.5L/min.

A ½" (13mm) solid tip flow cell probe is included and the volume of liquid inside the chamber with the probe installed is 65 ml. A variable speed pump is recommended but not included.



FLOW CELL ASSEMBLY

PART NO.
630-0651

REPLACEMENT PROBE

PART NO.
630-0644

CHILLER

Ultrasonic processing generates heat which may be detrimental to many applications. The chiller automates the cooling process with a 400W cooling capacity and controls temperature from 5-45°C.

Two models are available. The chiller **PART NO. 830-00905** is compatible with the cup horn system and does not include an internal reservoir to hold water. This model recirculates and chills the water inside the cup horn. This feature is important because it maintains a constant water level which improves sample processing. The tubing and connector set must be ordered separately **PART NO. 309-4911**.

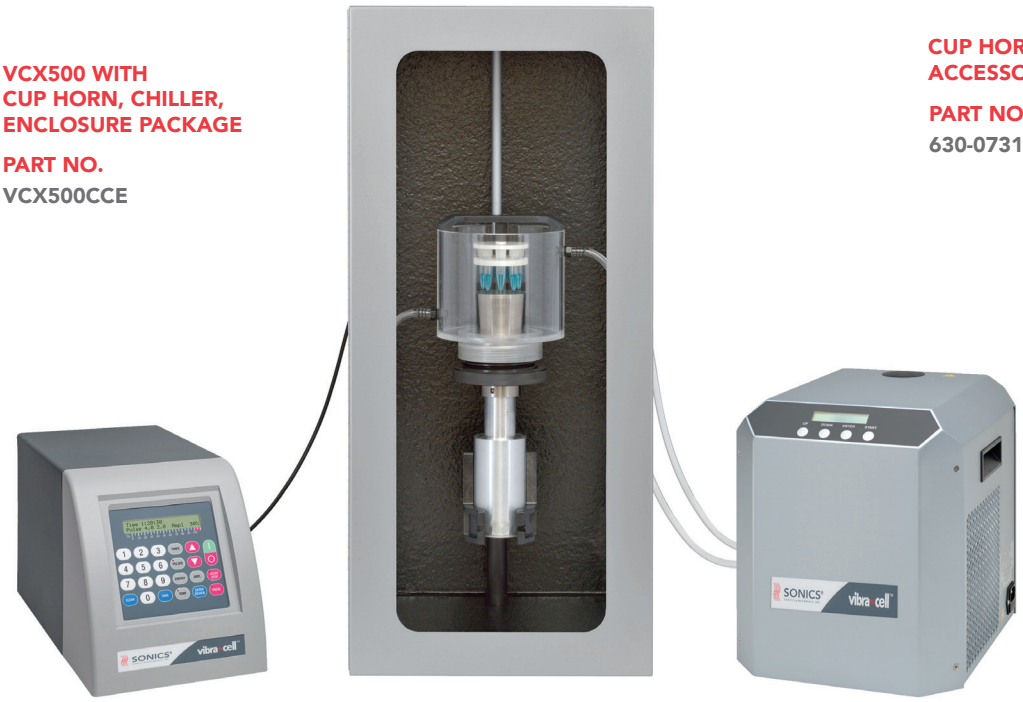
The chiller **PART NO. 830-00906** includes a 300mL internal water reservoir which enables it to be connected to any device that requires an external cooling system. This is the recommended chiller model for use when cooling the water jacket on a high volume flow cell.

CUP HORN ASSEMBLY

The cup horn can process multiple sealed tubes or vessels at one time without contact with an ultrasonic probe. This method eliminates cross contamination, sample foaming, overheating and aerosolization which can all occur when using a probe. Most importantly the cup horn enables samples under 200µl to be effectively processed.

VCX500 WITH CUP HORN, CHILLER, ENCLOSURE PACKAGE

PART NO.
VCX500CCE



CUP HORN ACCESSORY

PART NO.
630-0731

The water-filled cup horn is screwed onto the converter in place of a probe. Microtubes containing the samples are placed inside using specially designed tube holders. Multiple tube holders are available for various size tubes and vessels. Ultrasonic energy is transferred through the water and into the sample tubes.

Inlet and outlet ports enable cooling water to be circulated within the cup, inhibiting heat build up during extended operation. Use of the chiller is highly recommended and due to the high noise level created by the cup horn, a sound abating enclosure is required.

Note: Selecting the appropriate size and type of sample tube will greatly improve results. Contact Sonics for application assistance.

HOLDER FOR (8) 1.5ML POLYSTYRENE TUBES

PART NO.
830-00247

HOLDER FOR (8) 1.5ML POLYPROPYLENE TUBES

PART NO.
830-00248

HOLDER FOR 15ML TUBE

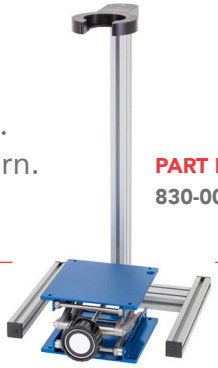
PART NO.
529-0029

HOLDER FOR 50ML TUBE

PART NO.
529-0030

HEAVY DUTY SUPPORT ASSEMBLY

Supports the converter and multi-element probe with minimum deflection. Includes lab jack. Recommended when working with any multi-element horn.



PART NO.
830-00130

LABORATORY JACK

Provides adjustable elevation from 2 ½" (64 mm) to 10" (254 mm). Top plate: 6" x 6" (152 x 152 mm).

PART NO.
830-00113

ROSETTE GLASS COOLING CELLS

The rosette is a glass cell that enables uniform treatment at low temperatures. Fill the rosette with your liquid sample and place it in an ice bath. The ultrasonic energy forces the sample to circulate under the probe and through the cooling arms.

300mL Rosette

PART NO.
830-00001

30mL Rosette

PART NO.
830-00003

JACKETED BEAKERS

The jacketed beaker is attached to a chiller or another cold water source. The chilled water is circulated around the liquid within the beaker maintaining the desired sample temperature.

10 mL cooling cell with water jacket

PART NO.
830-00009

100 mL cooling cell with water jacket

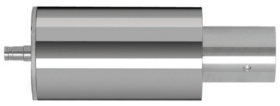
PART NO.
830-00010

TEMPERATURE PROBE

Enables temperature monitoring from 1 – 100°C.

PART NO.
830-00060

REPLACEMENT CONVERTER



PART NO.
CV334

REPLACEMENT CONVERTER CABLE

6' (1.8m) length

PART NO.
201-0300

REPLACEMENT WRENCH SET

The 750 and 500W ultrasonic processors include 2 spanner wrenches and a $^{9}/_{16}$" x $^{7}/_{16}$" open end wrench.

PART NO.
381-0005

HAND HELD FREQUENCY METER

Check the frequency of energized probes, converters and boosters
Frequency range:
10.00 kHz - 80.00 kHz

PART NO.
833-00012

FOOTSWITCH

For hands-free operation with 10' (3m) cable.

PART NO.
830-00004

SONOCHEMISTRY EQUIPMENT

The chemical effects of ultrasound are diverse and include dramatic improvements in both stoichiometric and catalytic reactions. In some cases, ultrasonic treatment can increase reactivity by nearly a million-fold. It does so through the process of acoustic cavitation; the formation, growth and implosive collapse of bubbles in a liquid.

During cavitational collapse, intense heating of the bubbles occurs. The localized hot spots have temperatures in the range of 5000°C, pressures approaching 500 atmospheres, lifetimes of a few microseconds, and heating and cooling rates greater than 109 K/s. Of special interest for sonochemistry research, is the fact that cavitation generates highly reactive free radicals that greatly enhance chemical reactions.

Applications for chemical reactions exist in both homogeneous liquids and in liquid-solid systems. Ultrasound has also been found to be beneficial for the initiation or enhancement of catalytic reactions, in both homogeneous and heterogeneous cases.

SONOCHEMICAL REACTION VESSELS

The adapter Part No. 830-00014 screws onto the special probe Part No. 630-0217 at the nodal point. The glass chamber slides onto the adapter and is secured in place as the bushing is screwed into the chamber compressing the O-ring. Moving the glass chamber up or down on the adapter allows the portion of the probe protruding out of the adapter to be immersed at the optimum depth into the sample.

4-10 ml reaction vessel. Two 14/20 side necks. Supplied with bushing and O-ring. Glass chamber height: 4 ⅞" (123 mm).

PART NO.
830-00011

10-50 ml reaction vessel. Bottom well capacity: 10 mL. Main body capacity: 50 ml. Two 14/20 side necks. Supplied with bushing and O-ring. Glass chamber height: 4 ¾" (120 mm).

PART NO.
830-00012

40-250 mL reaction vessel. Three 14/20 side necks. Supplied with bushing and O-ring. Glass chamber height: 6 ⅜" (162 mm).

PART NO.
830-00013

ADAPTER

5" (127 mm long). Stainless steel. Internally threaded. Screws onto a full wave 10" (254 mm) long ½" (13 mm) probe at the nodal point.

PART NO.
830-00014

SONOCHEMISTRY PROBE

½" (13 mm) special 10" (254 mm) long full wave solid probe. Used with the adapter above.

PART NO.
630-0217