

## PROBES FOR VC 505, VC 750, VCX 500 AND VCX 750

### PROBES

Probes (sometimes referred to as horns) are one-half wavelength long tools that act as mechanical transformers to increase the amplitude of vibration generated by the converter. They consist of two sections each having different cross-sectional areas. When driven at its resonant frequency, the probe expands and contracts longitudinally about its center. However, no longitudinal motion occurs at the threaded nodal point (area of no activity), allowing accessories to be connected to the probe at that point. 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. 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 usually recommended for processing difficult applications. Probes are fabricated from 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.

### PROBES\*

PART NO.	630-0220**	630-0219	630-0207**	630-0208	630-0210**	630-0209
TIP DIAMETER	½" (13 mm)	½" (13 mm)	¾" (19 mm)	¾" (19 mm)	1" (25 mm)	1" (25 mm)
TYPE	Threaded End	Solid	Threaded End	Solid	Threaded end	Solid
INTENSITY	High	High	Medium	Medium	Low	Low
VOLUME (batch)	10-250 ml	10-250 ml	25-500 ml	25-500 ml	50-1000 ml	50-1000 ml
AMPLITUDE*** micrometers (microns)	114	114	58	58	35	35
inches	.0045	.0045	.0022	.0022	.0014	.0014
LENGTH†	5½" (139 mm)	5½" (139 mm)	5" (127 mm)	5" (127 mm)	4 <sup>13</sup> / <sub>16</sub> " (122 mm)	4 <sup>13</sup> / <sub>16</sub> " (122 mm)

\* Connecting stud ½ - 20. Available with ¾ - 24 stud to enable connection to a 20 kHz converter manufactured by another company.

\*\* Do not use a probe with a replaceable tip when processing samples containing organic solvents or low surface tension liquids. Use a solid probe instead. See caution on page 8.

\*\*\* With the amplitude control set at 100%.

† Because ultrasonic probes are tuned to resonance, their length may vary slightly due to variations in the titanium's modulus of elasticity.

Note: With the amplitude control set at 100%, the amplitude at the converter tip is 16.5 micrometers (.0006 inch).



### HIGH GAIN PROBES\*

PART NO.	630-0306**	630-0310**
TIP DIAMETER	¾" (19 mm)	1" (25 mm)
TYPE	Solid	Solid
INTENSITY	High	Medium
VOLUME (batch)	25-500 ml	50-1000 ml
AMPLITUDE*** micrometers (microns)	75	76
inches	.0029	.0030
LENGTH†	5 <sup>13</sup> / <sub>32</sub> " (137 mm)	5 <sup>1</sup> / <sub>16</sub> " (133 mm)



\* Connecting stud ½ - 20. Available with ¾ - 24 stud to enable connection to a 20 kHz converter manufactured by another company.

\*\* Do not use with a booster.

\*\*\* With the amplitude control set at 100%.

† Because ultrasonic probes are tuned to resonance, their length may vary slightly due to variations in the titanium's modulus of elasticity.

Note: With the amplitude control set at 100%, the amplitude at the converter tip is 16.5 micrometers (.0006 inch).

## 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 coupler Part No. 630-0562 and two  $\frac{3}{4}$ " (19 mm) solid probes Part No. 630-0208.\* Power delivered to each probe is identical, and is half the total power delivered by the power supply. Center to center dimension between the probes is  $4\frac{1}{2}$ " (114 mm). Connecting stud  $\frac{1}{2}$  - 20.\*\* Part No. 630-0525

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

\*Custom three and four-element probes are available upon request.



## BOOSTERS

Boosters are used to process difficult applications. When connected between the converter and the probe, the booster (also called amplitude transformer) acts as a mechanical amplifier that increases the amplitude of vibration at the probe tip. Do not use with a microtip, extender, dual probe, or high gain probe. Connecting stud  $\frac{1}{2}$  - 20.\*\* Length: 5" (129 mm)

Part No. BHNVC15. Increases the amplitude by a factor of  $1\frac{1}{2}$ .

Part No. BHNVC21. Increases the amplitude by a factor of 2.

\*Two  $\frac{1}{2}$ " (13 mm) solid probes can be substituted for the two  $\frac{3}{4}$ " (19 mm) solid probes. Probes can also be supplied with threaded end and replaceable tip, however these probes should not be used when processing samples containing organic solvents or low surface tension liquids. See caution on page 8.

\*\* Available with  $\frac{3}{8}$  - 24 connecting stud to enable connection to a 20 kHz converter manufactured by another company.



## REPLACEABLE TIPS

Replaceable tips are fabricated from titanium alloy Ti-6Al-4V and are autoclavable.



### REPLACEABLE TIPS

	$\frac{1}{2}$ " (13 mm)	$\frac{3}{4}$ " (19 mm)	1" (25 mm)
PART NO.	630-0406	630-0407	630-0408
CONNECTING STUD	$\frac{1}{4}$ -20	$\frac{3}{8}$ -24	$\frac{1}{2}$ -20