

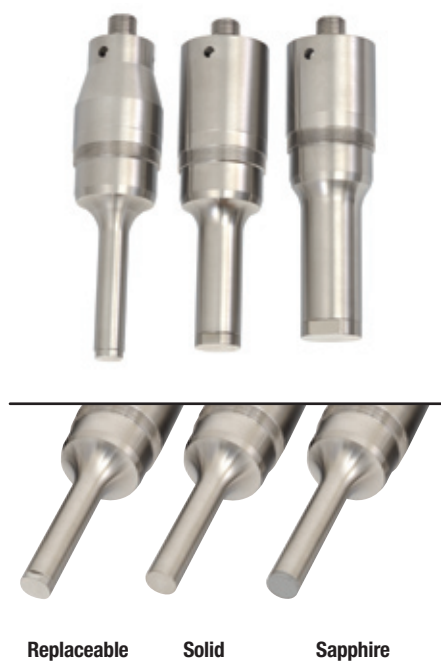
Horns (also known as probes) are made from titanium and machined to specific sizes and shapes. When driven at their resonant frequency, they expand and contract longitudinally. This mechanical vibration is amplified and transmitted down the length of the probe. In liquid, the probe causes cavitation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



Probe tips will pit or erode over time and require replacement. Using an excessively worn tip can affect your results and possibly overload the generator. Solid probes must be used for samples containing organic solvents or low surface tension liquids. Sapphire tips erode more slowly than titanium and are recommended for processing solutions that include abrasive materials.

Standard Probes



| Part # | Type of Tip | Processing Volume | Tip Diameter | Intensity | Amplitude (microns) |
|--------|-----------------|-------------------|----------------|-----------|---------------------|
| 4220 | Replaceable Tip | 10-250 ml | 1/2" (12.7 mm) | High | 120 µm |
| 4219 | Solid Tip | 10-250 ml | 1/2" (12.7 mm) | High | 120 µm |
| 4219S | Sapphire Tip | 10-250 ml | 1/2" (12.7 mm) | High | 120 µm |
| 4207 | Replaceable Tip | 25-500 ml | 3/4" (19.1 mm) | Medium | 60 µm |
| 4208 | Solid Tip | 25-500 ml | 3/4" (19.1 mm) | Medium | 60 µm |
| 4208S | Sapphire Tip | 25-500 ml | 3/4" (19.1 mm) | Medium | 60 µm |
| 4209 | Solid Tip | 50-1,000 ml | 1" (25.4 mm) | Low | 30 µm |
| 4209S | Sapphire Tip | 50-1,000 ml | 1" (25.4 mm) | Low | 30 µm |
| 4210 | Replaceable Tip | 50-1,000 ml | 1" (25.4 mm) | Low | 30 µm |

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.



New Tip

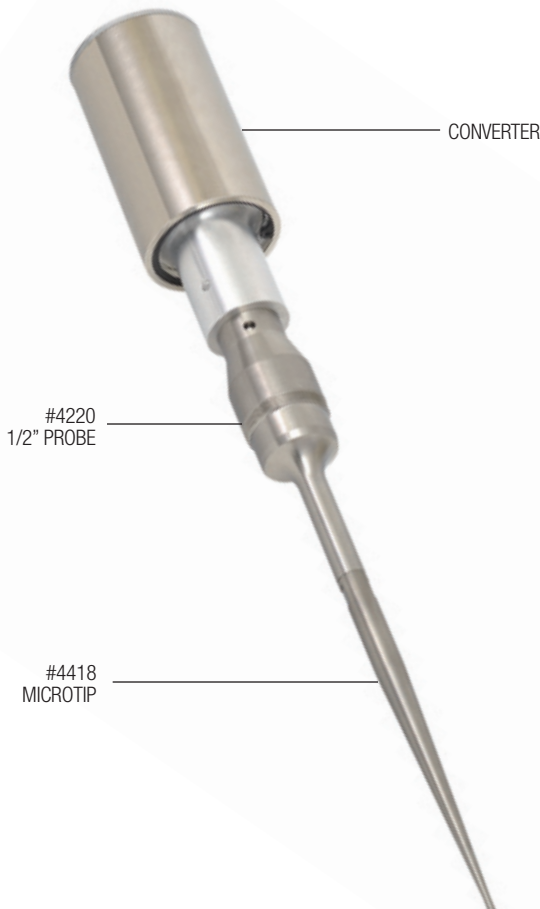


Worn Tip

| Part # | Tip Diameter | For Use With |
|--------|----------------|--------------|
| 4406 | 1/2" (12.7 mm) | #4220 |
| 4407 | 3/4" (19.1 mm) | #4207 |
| 4408 | 1" (25.4 mm) | #4210 |

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 | Intensity | Amplitude (microns) |
|--------|--|----------------|------------|---------------------|
| 4417 | 0.2-5 ml | 1/16" (1.6 mm) | Ultra High | 320 µm |
| 4418 | 0.5-15 ml | 1/8" (3.2 mm) | Ultra High | 240 µm |
| 4420 | 5-50 ml | 1/4" (6.4 mm) | High | 115 µm |
| 4422* | 0.5-15 ml | 1/8" (3.2 mm) | Very High | 205 µm |
| 4421* | Coupler required for use of a Stepped Microtip | | | |



Coupler

Stepped Microtip

* Stepped Microtip Assembly
The coupler screws directly into the converter.

Extenders

Standard probes may not be long enough to fit down into certain long necked vessels. Extender probes attach to standard horns of the same tip diameter and extend the length of the horn assembly. Extenders are available in 5" and 10" lengths with either solid, or replaceable tips.

Extenders offer the same processing volume and amplitude of their corresponding standard horn.



| Part # | Type of Tip | Length | Tip Diameter |
|--------|-----------------|--------|----------------|
| 406HW | Solid Tip | 5" | 1/2" (12.7 mm) |
| 406HWT | Replaceable Tip | 5" | 1/2" (12.7 mm) |
| 407HW | Solid Tip | 5" | 3/4" (19.1 mm) |
| 407HWT | Replaceable Tip | 5" | 3/4" (19.1 mm) |
| 408HW | Solid Tip | 5" | 1" (25.4 mm) |
| 408HWT | Replaceable Tip | 5" | 1" (25.4 mm) |
| 406FW | Solid Tip | 10" | 1/2" (12.7 mm) |
| 406FWT | Replaceable Tip | 10" | 1/2" (12.7 mm) |
| 407FW | Solid Tip | 10" | 3/4" (19.1 mm) |
| 407FWT | Replaceable Tip | 10" | 3/4" (19.1 mm) |
| 408FW | Solid Tip | 10" | 1" (25.4 mm) |
| 408FWT | Replaceable Tip | 10" | 1" (25.4 mm) |

Boosters



Booster horns increase the intensity of standard 3/4" and 1" horns. Boosters attach between the converter and horn to increase amplitude by the gain ratio indicated below. A 3 to 1 gain booster is available for custom applications.

| Part # | For Use With | Gain Ratio |
|--------|--------------------|------------|
| 4121 | 3/4" and 1" Probes | 2 to 1 |

High Gain Horns



High gain horns (also known as high intensity horns) offer double the amplitude of standard 3/4" and 1" horns. High gain horns attach directly to the converter.

| Part # | Type of Tip | Processing Volume | Tip Diameter | Amplitude (microns) |
|--------|-----------------|-------------------|----------------|---------------------|
| 4305 | Replaceable Tip | 25-500 ml | 3/4" (19.1 mm) | 120 µm |
| 4306 | Solid Tip | 25-500 ml | 3/4" (19.1 mm) | 120 µm |
| 4310 | Solid Tip | 50-1,000 ml | 1" (25.4 mm) | 60 µm |
| 4311 | Replaceable Tip | 50-1,000 ml | 1" (25.4 mm) | 60 µm |