Cleaning Tank Hydrophone with Acoustic Meter

**HCT-Series, MCT-1010**

Despite the wide adoption of ultrasonic and megasonic cleaning, the acoustic characteristics are not well understood. The HCT hydrophone with MCT acoustic meter bridges this gap, offering a reliable solution to characterize and monitor the acoustic properties of ultrasonic and megasonic cleaners. Its unique single point sensing design allows measurements with high spatial resolution to offer true 3-dimensional mapping of the cleaning tank. The rugged construction allows routine mapping of the acoustic pressure and ultimately determination of the cleaning efficiency of the tank.

**Applications**

- Acquire acoustic maps to optimize cleaning efficiency of ultrasonic and megasonic baths
- Routinely spot check acoustic field of cleaning tank for process control monitoring
- Compare tank-to-tank performance to maintain matching in production environments
- Tune process recipes by characterizing the ultrasonic cleaner fully loaded with substrates
- Identify cleaning tank issues such as debonded or malfunctioning transducers
- Collect lower level acoustic information by connecting probe directly to an oscilloscope

**Acoustic Pressure Plot of a 970kHz Semiconductor 200mm Single Wafer Cleaner indicating near field and standing wave effects**

[Courtesy of Seoul University, Kim, et al]
Technical Specifications

<table>
<thead>
<tr>
<th></th>
<th>HCT-0310</th>
<th>HCT-0200</th>
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</thead>
<tbody>
<tr>
<td><strong>Acoustic Pressure Range</strong></td>
<td>10 kPa to 1 MPa</td>
<td></td>
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<tr>
<td><strong>Useful Frequency Range</strong></td>
<td>30 kHz to 1.2 MHz</td>
<td>20 kHz to 200 kHz</td>
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<tr>
<td><strong>Acoustic Calibration</strong></td>
<td>30 kHz to 300 kHz (included)</td>
<td>30 kHz to 200 kHz (optional)</td>
</tr>
<tr>
<td><strong>Acoustic Calibration</strong></td>
<td>300 kHz to 1.2 MHz (optional)</td>
<td></td>
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<tr>
<td><strong>Dimensions</strong></td>
<td>Shaft: Diameter: 3 mm Length: 270 mm Handle: Diameter: 12 mm Length: 80 mm Cable: Length: 1.5 m coaxial (BNC)</td>
<td>Shaft: Diameter: 6 mm Length: 500 mm Handle: Diameter: 22 mm Length: 135 mm Cable: Length: 1.5 m coaxial (BNC)</td>
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<tr>
<td><strong>Chemical Compatibility</strong></td>
<td>pH 4 to 12 (Teflon)</td>
<td>Aqueous (SS)</td>
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<td><strong>Mechanical Isolation</strong></td>
<td>“Single Point” sensing</td>
<td></td>
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<tr>
<td><strong>Max. Operating Temperature</strong></td>
<td>70 ºC</td>
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Specifications are subject to change without notice.

**MCT-1010 Acoustic Meter**
- **Pressure Range**: 20 kPa to 20 MPa
- **Time Averaging Intervals**: 100 msec, 1 sec, 10 sec
- **Range Settings**:
  - 20 kPa to 200 kPa
  - 200 kPa to 2 MPa
  - 2 MPa to 20 MPa
- 4 digit LCD display
- **Power**: 9 V battery (dual)
  - Low battery indicator
- **Output**: $V_{\text{RMS}}$ with ref to display (BNC)
- **Dimensions (with display guard)**:
  - 111 mm (W) x 190 mm (L) x 57 mm (D)

**Simple Measurement Set-up**

1. 1.5 meter
2. $V_{\text{RMS}}$
3. Data Logger
4. Chart Recorder
5. Voltmeter
6. (customer supplied)