

## Acoustic Cavitation Meter

### HCT-0310 and MCT-2000

The advanced MCT-2000 acoustic cavitation meter addresses the critical need to quantify the cavitation performance used in ultrasonic cleaning and sonoprocessing applications. Coupled with a calibrated HCT-0310 hydrophone, four key parameters are determined instantaneously :

- Fundamental Frequency,  $F_0$
- Direct Field Pressure,  $P_0$
- Stable Cavitation Pressure,  $P_S$
- Transient Cavitation Pressure,  $P_T$

This is done by analyzing the calibrated acoustic spectrum which captures different pressure components. Mechanical sound waves induced by transducers oscillating at the fundamental frequency generate the direct field pressure. Rapid changes in pressure within the liquid create cavities or "cavitation". Stable cavitation represents a cavity oscillating in size and shape, resulting in micro-streaming effects. Transient cavitation occurs beyond a pressure threshold, where the cavities collapse creating jetting effects and shockwaves.

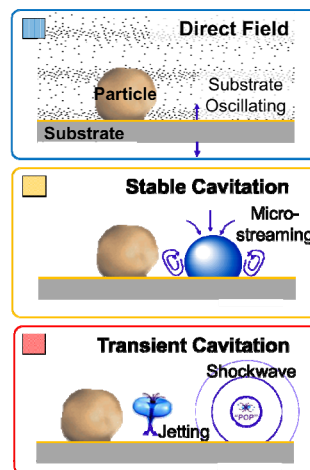
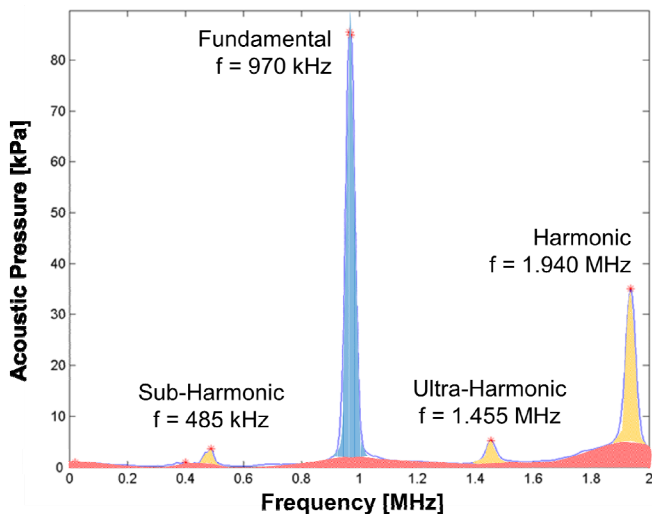
### Applications

- Characterize ultrasonic and megasonic cleaning tanks, sonoprocessing systems, and other devices that rely on acoustic cavitation.
- Determine the primary cleaning mechanism by comparing the level of direct field pressure, stable cavitation pressure, and transient cavitation pressure.
- Develop and continuously monitor the process window to maximize particle removal and limit damage
- Routinely spot check the acoustic field of cleaning tank for process control monitoring



HCT Hydrophone and MCT-2000 Cavitation Meter

## Anatomy of Acoustic Spectrum



## Technical Specifications

### HCT-0310 Hydrophone

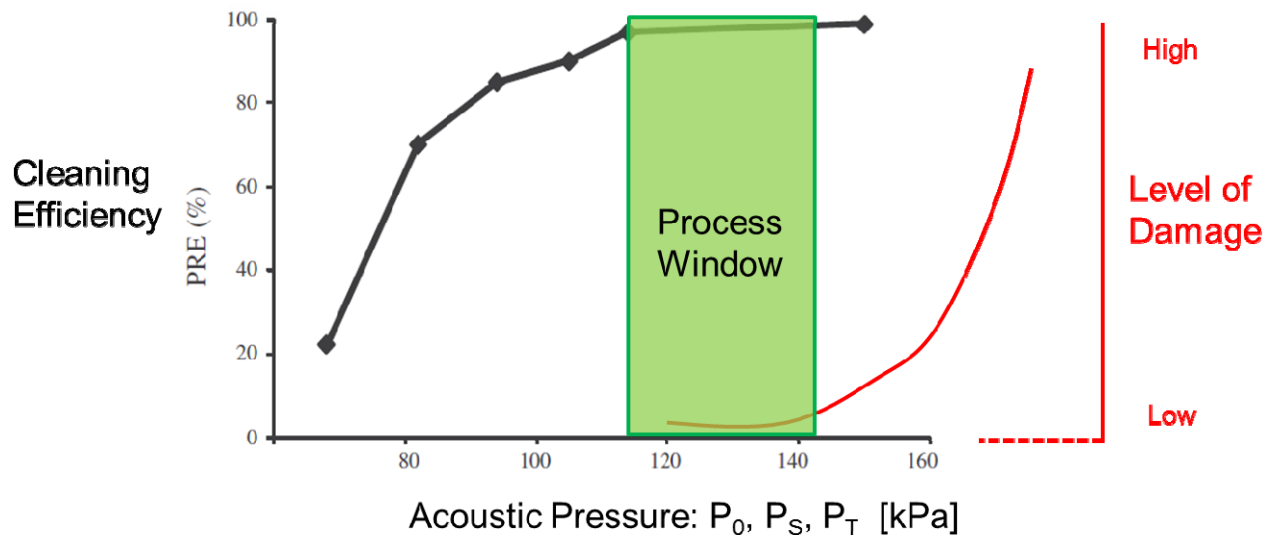
- *Useful Frequency Range:* 30 kHz to 1.2 MHz  
Acoustic Calibration Included  
Stored in embedded memory  
Traceable to National Physical Laboratory
- *Maximum Operating Temperature:* 70 °C
- *Chemical Compatibility:* pH Range 4 to 12 (Teflon)
- *Probe Dimensions:*  
Shaft Length: 270 mm  
Shaft Diameter: 3 mm  
Handle Length: 80 mm  
Handle Diameter: 12 mm
- *Cable:* LEMO connector with embedded hydrophone calibration file

### MCT-2000 Cavitation Meter

- *Measured Parameters:*  
Fundamental Frequency,  $F_0$  (MHz)  
Driving Field Pressure,  $P_0$  (kPa)  
Stable Cavitation,  $P_S$  (kPa)  
Transient Cavitation,  $P_T$  (kPa)
- *Data Management:*  
Touch panel display  
Time averaging interval: 1-60 sec  
Data logging to local memory  
Save parameters, spectrum, waveform  
Export as text or binary  
Remote access for maintenance
- *Power:* AC power plug
- *Dimensions:*  
232 mm (W) x 113 mm (H) x 215 mm (D)

Specifications are subject to change without notice.

## Develop and Monitor the Process Window



**The energy from the implosion of a cavity is sufficient to overcome particle adhesion forces, while excessive cavitation energy can damage the surface of a substrate.**