

# H2oBioSonic.com

## Advanced Ultrasonic Bio Fouling Protection Systems Ultrasonic Acoustic Cavitation Effect Explained



### Ultrasonic Acoustic Cavitation - Ultrasonication

The H2oBioSonic Bio Fouling Protection Systems utilize advanced variable acoustic cavitation at a microscopic level through the ultrasound frequency range, typically between 20-200kHz depending on the application.

Acoustic cavitation (Ultrasonication) is produced by ultrasonic sound waves in a liquid due to pressure variations. Sound waves propagate into the liquid resulting in an alternating high-pressure (compression) and low-pressure (rarefaction) cycles. During rarefaction, high-intensity sonic waves create small vacuum bubbles or voids within the liquid. These bubbles then collapse violently (cavitation) during the compression phase of the sound wave creating very high local pressure and temperature at a microscopic level. As the frequency used is between 20-200kHz the rate of these bubble implosions is at 20,000 - 200,000 times per second and each sound wave producing potentially millions of bubbles.

### The Effects Explained

The high compressibility of the imploding bubble means that much potential energy is released from the ultrasonication. This release of energy has some very important properties.

- Disrupts or destroys microscopic algae and microorganisms, providing a sterilizing effect.
- Provides a microscopic scrubbing effect which can break down solids allowing for cleaning and maintenance of internal structures.

