



## Non-Invasive Ultrasonic Detection of Biofilm

OTT ID # 1623

### Applications

Healthcare, water management, food industry, biofilm detection, hospital management

### Target Problems

Biofilms are ubiquitous, they impact many areas of human life, such as microbial related diseases and infections. Often the surfaces on which biofilm formation occurs are not readily visible, for example, inner surfaces of the pipes and tanks that contain substances intended for human exposure. Incorporating sensors inside pipes or tanks can be difficult and sensors exposed to the environment often degrade over time and lose sensitivity.

### Key Features

- **Sensitive and Versatile** – Enables early-stage detection of biofilms on any types of body that is used to contain a fluid medium (e.g. inner surfaces of pipes, tanks or tubes)
- **Real-Time Monitoring** – Instantaneous results thus enabling the user to take quick actions.
- **Retrofit** – The entire set up can be fit to the existing plant and is non-destructive.

### Technology

Dr. Marcia Silva, an Inventor at University of Wisconsin, Milwaukee (UWM), has developed a novel method and a system that uses an acoustic wave system to detect the amount of biofilm inside a pipes, tanks, or tubes containing a fluid. The method applies to any inner surfaces of the body used for containing fluid medium and or intended for human use or consumption. By utilizing this early and non-invasive detection system many issues with people getting sick from these microbial consortia can be significantly reduced. This technology uses a transmitter, receiver, and electronic controller to send, receive and detect an ultrasonic signal based on the attenuation (the reduction of the amplitude of a signal) and phase shift of the signal. Although attenuation by single reflection is too small to detect, the attenuation by multiple reflections is large enough to be accurately characterized and can be implemented on any types of body that is used for containing a fluid medium.

### Intellectual Property

U.S Utility Patent Filed December 2020.

### About the Inventor(s)

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