

Foreign object and fouling sensors for piped aqueous food mixtures

Key Features

Simple and effective device for

- detection of metallic and non-metallic foreign objects in aqueous media
- fouling onset (and removal) detection

Technology

Researchers at the University of Canterbury have developed electromagnetic sensing technology designed for real-time detection of foreign objects and fouling in piped aqueous food mixtures, it leverages electrical admittance sensing and tomography principles to identify contaminants and monitor process conditions without disrupting production. The foreign object and fouling detecting functions can be combined into a single sensor and could include more complex functions such as

- foreign object size and shape estimation
- mixture and/or temperature homogeneity
- impedance spectroscopy for detecting chemical adulteration

Both sensor types will also measure average electrical conductivity of the medium, will run a webserver, and be Ethernet capable for SCADA integration.

The sensors look identical and are designed to fit existing 304 or 316 stainless steel pipework:

- 2" (50 mm) and 4" (100 mm) sizes will be implemented initially.
- Tri-Clover (aka Tri Clamp) standard fittings will be used, although DIN or RJT can also be specified.
- Length between flange faces is approximately 350 mm.



Applications

- Foreign object and fouling detection of aqueous media in food and beverage industry
- Foreign object and fouling detection of other aqueous media

Researchers

[Bill Heffernan](#) (Electric Power Engineering Centre)
[Michael Hayes](#), [Alan Wood](#) [Phil Bones](#) (Electrical and Computer Engineering)

Stage of Development

Lab prototype

Intellectual Property

PCT Application: PCT/IB2024/061641
Pending in USA, EPO, NZ and AUS

Recent Publications

Detection of Foreign Bodies Flowing in a Pipe Using Longitudinal Electric Excitation ([IEEE](#))

Contact Details

Michael Love
Commercialisation Advisor
Research & Innovation
University of Canterbury
E: Michael.Love@canterbury.ac.nz