

BROMEDIR

Broadband MEMS-based InfraRed spectrometers: The core of a multipurpose spectral sensing photonic platform

Use Case Successes: Achievements Overview



**Milk analysis
FTIR System**



**Fuel quality control
FTIR System**



**Hydrogen quality
control PTS System**



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MILK ANALYSIS USE CASE

The goal of this use case was to develop a compact, portable FTIR sensing platform capable of delivering laboratory-grade milk quality and animal health analysis directly on the farm.



- Proven in real farm conditions through successful mobile laboratory demonstrations.
- Delivers rapid on-site milk quality analysis, eliminating the need to transport samples to centralized laboratories.
- Analytical performance comparable to high-end laboratory FTIR instruments in a compact, portable format.
- Enables measurement of key milk quality parameters and supports precision livestock farming.
- Supports faster decision-making for milk quality control, animal health monitoring, and food safety assurance.

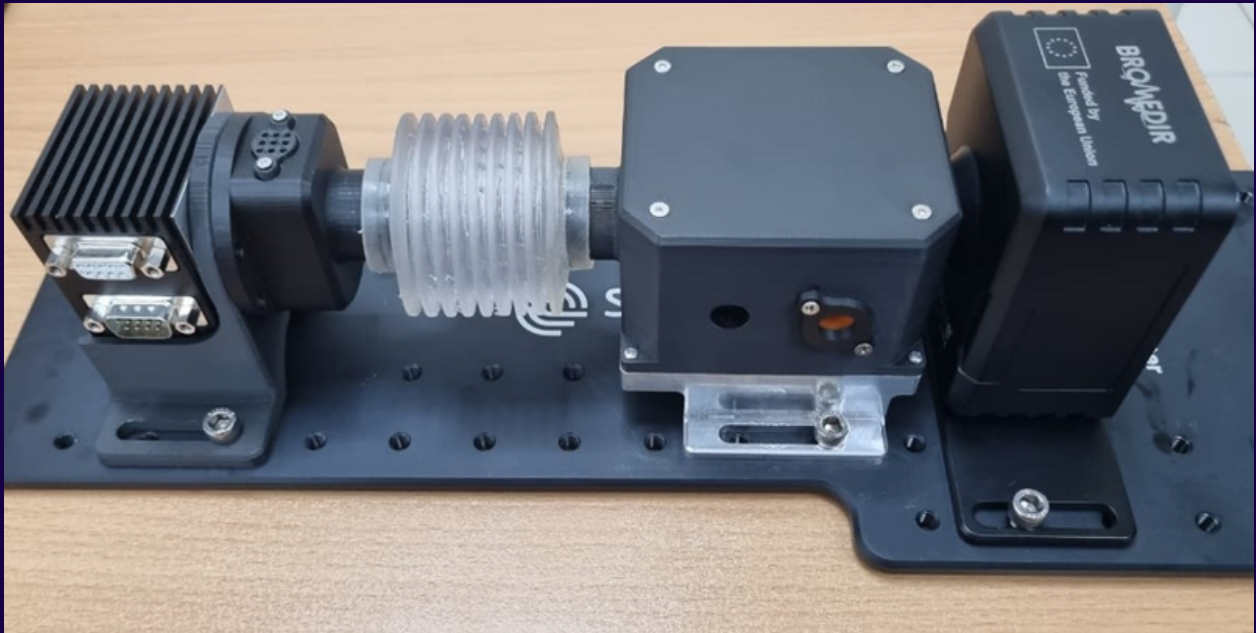
Watch the Demonstrations and learn more details:

[Milk Use Case Validation Video \(M37 Meeting, Namur, Belgium\)](#)

[BROMEDIR M37 Consortium Meeting Video](#)

FUEL ANALYSIS USE CASE

The goal of this use case was to develop a miniaturized FTIR-based solution for rapid, on-site monitoring of fuel quality and contamination, including jet fuel and biodiesel blend verification



- Successfully validated for fuel quality at TU Wien.
- Compact MEMS-based FTIR technology delivers results closely aligned with established laboratory instruments.
- Enables rapid on-site analysis of liquid fuels, reducing dependence on centralized laboratory testing.
- Supports detection and monitoring of fuel composition and potential contamination.
- Designed to support faster decision-making, improved safety, and enhanced quality assurance across the fuel supply chain.

Watch the Demonstrations and learn more details:

[Fuel Use Case Validation Video \(TU-Wien\)](#)

[BROMEDIR M42 Consortium Meeting Video](#)

HYDROGEN PURITY ANALYSIS USE CASE

The goal of this use case was to develop a highly sensitive spectroscopic platform for real-time detection of trace impurities and continuous hydrogen quality monitoring throughout the hydrogen supply chain.



The BROMEDIR hydrogen use case demonstrates a novel approach to hydrogen quality assurance by combining advanced photothermal spectroscopy with an innovative hydrogen separator-compressor system. Developed and demonstrated by TU Wien through the collaboration of the research groups of Professor Bernhard Lendl and Professor Michael Harasek, the system delivers a fully integrated platform for continuous hydrogen processing and monitoring

- Successfully demonstrated in a fully integrated hydrogen processing system, validating the BROMEDIR platform under realistic operating conditions.
- Delivers highly sensitive, real-time detection of trace impurities that can affect hydrogen performance, safety, and compliance.
- Enables continuous hydrogen quality monitoring directly during production, purification, and distribution processes.
- Supports faster operational decisions, improved reliability, and safer deployment of hydrogen technologies across the supply chain.

Learn more details:

[**BROMEDIR M42 Consortium Meeting Video**](#)

PROJECT CONTACT DETAILS

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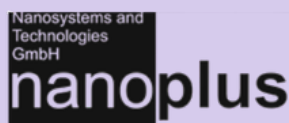


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>>> CONTACT DETAILS

Website: <https://bromedir.eu/>

Email: info@bromedir.eu



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