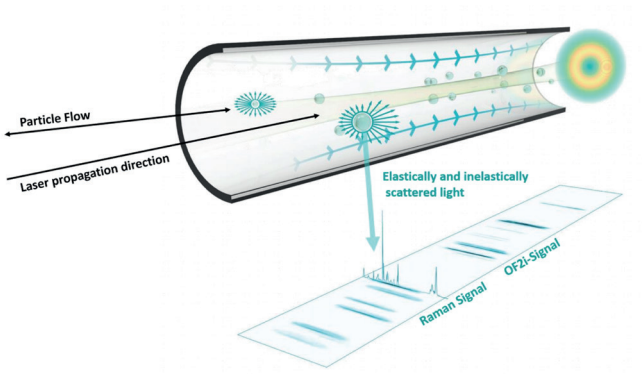
Optofluidic Force Induction (OF2i) Factsheet

Contact information:

Name of organisation: BRAVE Analytics GmbH
Address: Stiftingtalstraße 14, 8010 Graz, Austria
Email: sales@braveanalytics.eu
Phone nr: +43 676 842 032 322
Website: www.braveanalytics.eu



Technical information:

The Optofluidic Force Induction (OF2i®) technology works as an online measurement principle which uses microfluidics and optical forces to accelerate particles in liquids through a measuring cell.
The optical forces of the laser cause size-dependent velocity changes of each particle.
By measuring the velocity of the individual particles, particle size, size distribution as well as particle concentration can be determined. The measurement is continuous and therefore allows online process monitoring, monitoring of dynamic changes and evaluation of polydisperse substances in real time.
Different particle populations can be measured in parallel and with a throughput of up to 3000 particles per minute.

Technical specifications

Working conditions:

Online measurement via a bypass. For nanosuspensions, nanoemulsions and colloidal formulations: liquid continuous phase; solid or liquid dispersed phase. Concentration range: minimum 10^4 objects/ml; optimal >10^{10} objects/ml

Minimum required bypass flow:

Plant-dependent, custom-tailored solution for each case

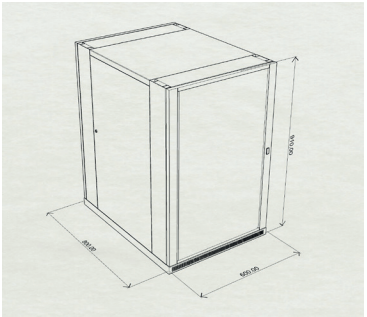
Measurement time specs:

Continuous update of values 1x per second; delay due to bypass: up to 1 minute (sample- and plant-dependent)

Connections to the plant:

The BRAVE B-Continuous PAT sensor is installed in a bypass. It automatically takes a sample from the production line, dilutes it and analyzes the particle size and particle concentration in an interval of 4 to 10 seconds.

Sketch and dimensions:



width: 800 mm

depth: 600 mm

height: 910 mm

Measurable particle size:

50 nm to 5 µm (sample-dependent, expected range)

This project has received funding from the Horizon 2020 Framework Programme of the European Union under grant agreement No 862583.

Benefits

- **OF2i®** is fast: results available in seconds with high statistical relevance
- **OF2i®** measures continuously and in real time: providing a live stream of data for complete monitoring of the production process 24/7
- **OF2i®** has single-particle sensitivity: for results representative of all the particle populations, even at ultra-low concentrations
- **OF2i®** Raman (coming soon) detects and identifies lowest concentrations of particle populations (e.g: micro- and nanoplastics, organic materials or minerals) at high sample throughput with single-particle sensitivity

Applications

Biotech & Pharma

Environmental Analysis, Water & Nanoplastics

Cosmetics

Key parameters in comparison with other methods

Method	Dynamic Light Scattering (DLS)	Nanoparticle Tracking Analysis (NTA)	Laser Diffraction	Optofluidic Force Induction (OF2i®)
Integration into the production process	Limited	No	Possible	Yes
Measurement of particle concentration	Limited	Limited	No	Yes, clearly defined active measuring volume
Measurement of particle size distribution for monodisperse samples	Yes	Yes	Yes	Yes
Measurement of particle size distribution for polydisperse samples	Difficult	Difficult	Difficult	Yes
Detection range (particle size)	1 nm to 10 µm (sample-dependent)	10 nm to 1 µm (sample-dependent)	10 nm to 3 mm (sample-dependent)	50 nm to 5 µm (sample-dependent, expected range)
Monitoring of dynamic processes	Limited	Limited	No	Yes

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