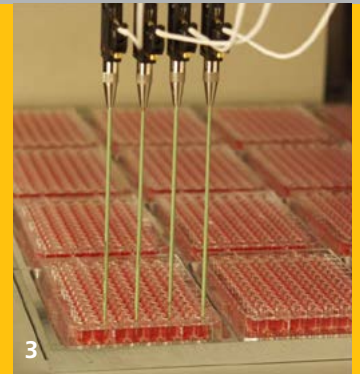




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1 *Functional model of a measuring module for determining cell density*

2 *Spectroscopic analysis of a biochip*

3 *Halide screening*

INLINE METROLOGY FOR BIOTECHNOLOGY

Inline metrology

Higher quality, lower costs and minimized contamination can be achieved by automating biotechnological production processes. However, random laboratory tests are too time-consuming and cost-intensive to control products in automated production processes and can only rarely be utilized for monitoring processes. Furthermore, samples are often not representative and pose an additional contamination risk.

The solution is to implement inline metrology for continuous product control and process monitoring. Inline metrology has a number of advantages, such as:

- No sample-taking required
- Results can be used for process control in real time
- Less labor-intensive
- Easier documentation and traceability

Questions

Are you a plant or equipment manufacturer searching for sensor solutions for your product automation in order to improve quality and profitability through closer process monitoring and control? Do you manufacture sensors and want to break into new markets and applications?

If so, the Fraunhofer Institute for Manufacturing Engineering and Automation IPA is your ideal partner in helping you find cost-effective, practicable solutions. During the joint development of inline measuring solutions, you benefit especially from our experience in:

- Selecting measuring principles and sensors
- Analog and digital circuit technology
- Optical metrology and spectroscopy
- Acquisition and analysis of measurement data
- Hygienic design

CONTACT

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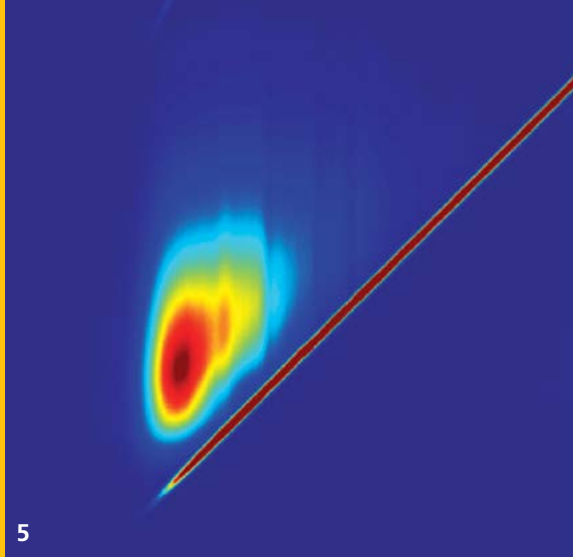
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Services

Among others, our services include:

- Analyzing requirements and drawing up specifications
- Researching state-of-the-art, cross-industry technology
- Developing new measuring procedures and adapting existing ones
- Carrying out realization tests and preliminary tests
- Developing products up to small-scale series
- Integrating sensors into equipment and facilities
- Environmental testing (e. g. resistance to temperature, autoclavability, resistance to vibration)

Application: cell density sensor

The determination of cell density plays an important role in controlling biotechnological processes.

At the Fraunhofer IPA, an innovative measuring principle for determining cell density has been developed and its functionality verified in the course of preliminary tests.

In contrast to currently implemented solutions, the new technique is also suitable for high cell densities, requires no calibration and can be easily integrated into equipment and facilities.

Application: water activity sensor

Water activity is an important parameter for assessing the shelf-life of foods but can only be measured inline in certain cases.

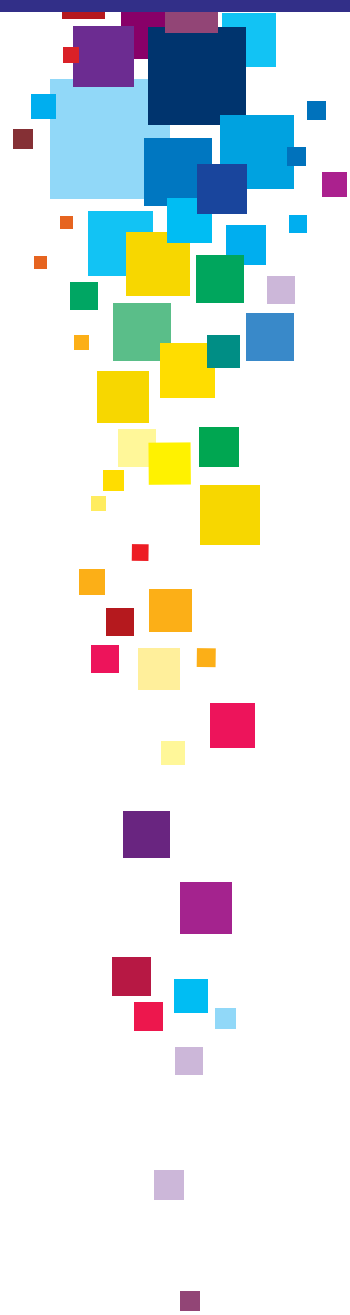
In consequence, the Fraunhofer IPA has developed a new measuring device for determining water activity during production. When developing the sensor, particular importance was placed on the use of standard mechanical and electronic interfaces as well as on the robustness of the sensors.

The result is the functional model of a sensor which can be utilized in food manufacturing or to control biotechnological processes.

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More detailed, current information can be found under:

www.bioproduktion.com



4 Spectroscopic analysis of a biochip
 5 Stimulation and emission matrix of a biological sample