INNOVATION LAB “FLEXISENS”

Magnetic field sensors with new unexplored functionalities

HELMHOLTZ ZENTRUM DRESDEN ROSSENDORF

MAGNETIC FIELD SENSORS

Magnetic field sensors detect, measure and control any type of movement: translation, rotation, vibration, distancing. They are fast, long-lasting and very reliable. Conventionally, the sensors are rigid.

DEVELOPMENT

We developed novel high performance magnetic field sensors on ultrathin flexible substrates, which posses high mechanical conformability.

Flexible and printed sensors can be applied on different not only flat but also curved objects due to their extreme thinness and unconventional mechanical properties. Our technology enables new fields of applications of magnetic field sensors.

APPLICATION FIELDS

- Real-time monitoring of gap fields:
  - electromobility: E-cars, E-bikes
  - wind turbines, big electrical machines
- High precision machining tools
  - magnetic bearing systems
- Soft robotics
  - active control of soft actuators
- Interactive consumer electronics
  - printed switches
  - wearable electronics
  - augmented and virtual reality
  - smart textile
- Building safety
  - Smart house applications

TECHNOLOGY

The Helmholtz Innovation Lab “FlexiSens” focuses on the development and application of flexible and printable magnetic field sensors (Hall effect and magnetoresistive effects). Our technology allows to realize printed magnetic field sensors.

FLEXIBLE SENSORS

- Flexible sensors are on polymeric substrates with a thickness from 1 µm to 100 µm
- Sensors can be processed on a sample area up to 12” wafer size
- Fully customized sensor layout
- Sensors mechanically bendable below 1 mm bending radii
- Stable electrical properties upon mechanical deformations

PRINTED SENSORS

- Different rigid and flexible substrates (paper, ceramic, silicon, textile, polymers)
- Substrate thickness from 6 µm
- Tunable sensitivity to magnetic field in the range from 0.5 mT to 200 mT
- Temperature sensor stability up to 90 °C
- Sensors mechanically bendable below 1 mm bending radii
- Fully customized sensor layout

www.flexisens.de
www.smartsensorics.eu

YOUR BENEFITS

Magnetic field sensors

- Flexible and very thin > 1 µm
- Mechanically conformal to flat and curved objects
- Printable on different materials
- Customized sensor design

OUR OFFER

- Flexible and printable sensors
- Magnetosensitive powder
- Magnetosensitive paste
- Large area optical lithography and depositions
- Structural and magnetic characterization

COOPERATION

- Production and vendor of powder, paste and printing of magnetic field sensors
- Technology licensing
- Joint development of sensors, pastes and applications
  - Direct industrial contact
  - Third party founded projects

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