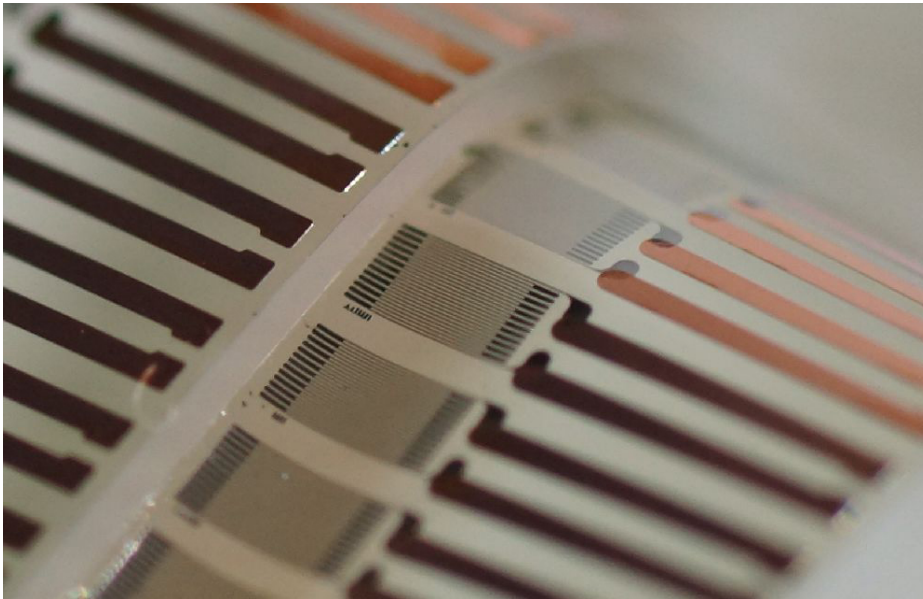


Minimal pressure measured based on magnetism



Auf einen Blick

- Novel pressure measurement system based on magnetism
- Linear relationship between pressure and sensor signal
- Two tailorable system components for various applications
- Applications range from biomedicine to soft robotics

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IMPT | Classical gas pressure cannot be measured in this way – but the deformation of an elastic membrane. A measurement based on magnetism is possible when hard magnetic particles are embedded in the membrane. This is proved by experiments made at the Institute of Micro Production Technology (IMPT).

IMPT investigates a novel method, which is based on magnetism, to specifically measure contact pressure. The system consists of a membrane, which possesses magnetic properties due to embedded hard magnetic particles.

When an external force deforms the membrane, the strength of the magnetic field emitted by the membrane changes with respect to a fixed geometrical point. Placing a magnetic field sensor at the geometrical point allows an indirect measurement of the applied force (and the pressure through the area). An elastomer (polydimethylsiloxane – PDMS) is used as the membrane elastomer in combination with hard magnetic particles; the sensor is an anisotropic magneto-resistive layer.

Preliminary experiments showed a linearly proportional change in intrinsic resistance with an increase of applied force, which shows that it is in principle possible to measure pressure and determine spatial distribution, when using several sensors.

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