

Success in Technology Development of a Wide-Range MI Sensor for the Security and Medical Fields

- Commencement of sample sales of wide-range MI sensor with a wider measurement range in high-sensitivity areas -

Aichi Steel Corporation (President: Takahiro Fujioka) is working to improve the performance of the MI sensor^{*1} to apply its technology to the security and medical fields (Fig. 1) with the target year set as 2030. As a part of the company's development results, Aichi Steel has succeeded in developing technologies for a wide-range MI sensor that can detect weak magnetic fields even in environments surrounded by magnetic fields far stronger than geomagnetism. Accordingly, the company has started selling samples^{*2}.

The MI sensor is an extremely highly sensitive magnetic sensor based on the MI effect discovered in 1993 by Dr. Kaneo Mohri, a professor emeritus at Nagoya University, which has been successfully developed and mass-produced through the application of technologies relating to materials, magnetic properties, and surface treatment that Aichi Steel has been improving since its founding. We have delivered more than 140 million MI sensors mainly for use as electronic compasses for mobile phones.

Due to growing demand for detection of weak magnetic fields in the security and medical fields in recent years, Aichi Steel has been providing Type DH, a product that is even more highly sensitive than those used in electronic compasses. There was strong demand from the market to use MI sensors in environments surrounded by strong magnetic fields. To realize such a technology, however, we needed to develop a magnetic sensor that would provide both high sensitivity and wide measurement range, which was a technologically difficult challenge.

As a result of taking on this challenge, Aichi Steel has successfully developed a wide-range MI sensor with an extended measurement range by feeding back a part of the MI sensor output as magnetism to the amorphous wire. In general, two coils, one for taking care of the MI sensor output and the other for magnetic feedback, are required to implement this technology. However, we have achieved both high sensitivity and wide measurement range with a single coil through the new magnetic feedback technology developed by us this time (Fig. 2).

This technology is expected to be applied to situations such as metal detection near an MRI examination room that generates strong magnetism, detection of mixed foreign substances in manufacturing lines and use in magnetic security gates.

As an important product that will contribute to the Smart Company's target sales of approximately 60 billion yen in 2030, Aichi Steel will further improve the performance of the MI sensor and aim to contribute to a safe and secure society through our micro magnetism sensing technology.

*1 For more information on the MI sensor, see the special website. (<https://www.aichi-steel.co.jp/ENGLISH/smart/mi/>)

*2 The product we developed this time will be displayed at Sensors Coverage Expo & Conference 2022 (US) in June, Sensor Expo Japan in September and Electronica 2022 (Germany) in November.

Fig. 1: Technology Development of an MI Sensor with a Wider Measurement Range in High-Sensitivity Areas

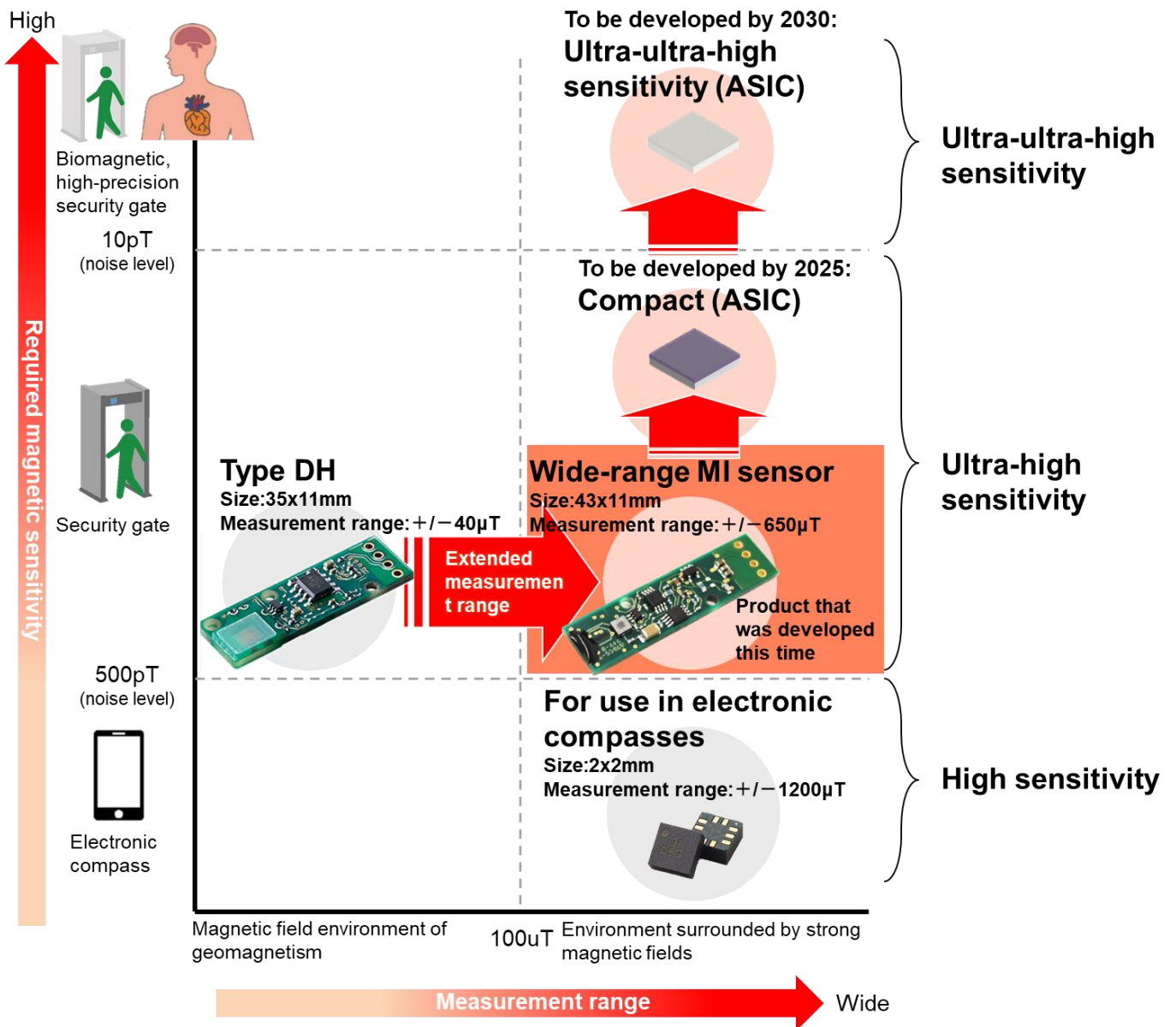


Fig. 2: Magnetic Feedback Technology that Extends Measurement Range

