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Tamura Corporation

Development of a High-Permeability Powder Magnetic Core

Tamura Corporation (Headquarters: Nerima-ku, Tokyo; President & COO: Mitsutaka Nakamura; hereinafter "the Company") announces that it has developed a powder magnetic core with significantly enhanced magnetic permeability, achieving a relative permeability of $\mu_r = 1000$, in collaboration with Tohoku University Material Solutions Center (hereinafter "MaSC") (Note 1), and has begun applying the technology to magnetic components such as transformers.

In contrast to bulk metallic magnetic materials, powder magnetic cores feature high electrical resistivity and excellent moldability, and are therefore widely used in magnetic components for power supply circuits in smartphones and personal computers. However, achieving high magnetic permeability—an essential property for the miniaturization of inductors and transformers and for reducing energy losses—has remained a major challenge.

Through this joint development, the Company and MaSC have established a new process that enables the high-density compaction of flake-shaped FeSiAl alloy particles with controlled particle orientation. This process has enabled the material to achieve a relative permeability of $\mu_r = 1000$ —approximately one order of magnitude higher than that of conventional powder magnetic cores—and exhibits excellent heat resistance.

Going forward, the Company and MaSC will continue to work together to create technologies that contribute to higher efficiency and enhanced reliability in clean energy-related markets (Note 2), which are evolving toward higher current, higher voltage, and higher frequency operation.



Toroidal powder magnetic cores



Brick-shaped powder magnetic cores

(Note 1)

MaSC, which was established in January 2014, is a cooperative base between academics and private companies with the help of government, which aims to promote the development of new-functional materials for industrial use and to boost up the local economy in Tohoku region. MaSC has been set up in a joint effort of Tohoku University and its four institutes: Institute for Materials Research (IMR), Institute of Multidisciplinary Research for Advance Metals (IMRAM), Institute of Fluid Science (IFS) and Research Institute of Electrical Communication (RIEC). The construction fees are partly supported by the Ministry of Economy, Trade and Industry.

(Note 2)

The Company's key focus markets, consisting of four areas: power infrastructure, heavy industry, next-generation communications, and mobility.

About Tamura Corporation

Tamura Corporation celebrated its 100th anniversary in May 2024. Founded as a manufacturer and seller of radios and electronic components, the Company has now expanded its offerings to include electronic components such as transformers and reactors, solder pastes, solder mask, automatic soldering systems, and audio mixing consoles for broadcasting stations.

Tamura Corporation is listed on the Tokyo Stock Exchange Prime Market (StockCode:6768).

URL: <https://www.tamuracorp.com/global/>

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