

March 25, 2026

Japan Material Technologies Corporation

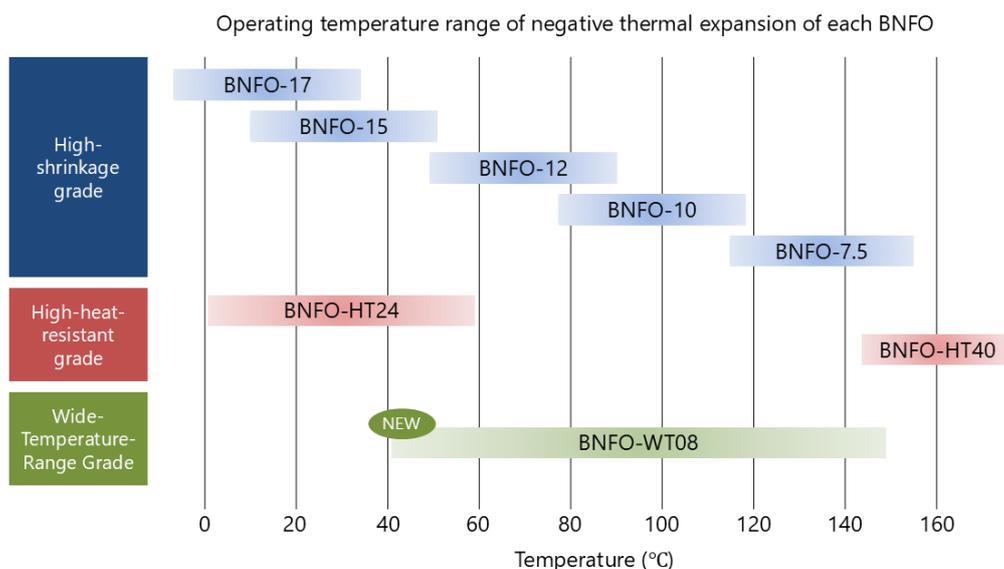
Development of Wide-Temperature-Range Grade for Negative Thermal Expansion Material BNFO

— Material for Electronic Devices Enabling Stable Operation from Room Temperature to High Temperatures —

Japan Material Technologies Corporation (Head Office: Chuo-ku, Tokyo; President: Koyu Urata; “JMTC”) is pleased to announce the development and commencement of sales of a new negative thermal expansion (NTE) material, BNFO-WT (wide-temperature-range grade), which is compatible with a broad temperature range of approximately 40°C to 150°C.

BNFO ($\text{BiNi}_{1-x}\text{Fe}_x\text{O}_3$: bismuth nickel iron oxide) is a groundbreaking material that exhibits significant NTE (shrinking as temperature rises) within its phase transition temperature range, in contrast to conventional materials that expand when temperature increases. In many industrial fields, including electronic components, thermal expansion due to heat generation has posed challenges to product reliability, but there have been few materials available to control such expansion. BNFO offers a promising solution to this issue and is expected to be used in diverse applications such as precision plastic-molded parts, conductive pastes, and adhesives.

Through the addition of multiple elements and composition control, JMTC has mitigated phase transition behavior associated with temperature changes and developed BNFO-WT08 (NTE range: approximately 40°C to 150°C) as a wide-temperature-range grade that exhibits continuous NTE characteristics from room temperature to high temperatures. This enables coverage of the broad operating temperature range required for electronic devices with a single material. This material was invented using Bayesian optimization by Professor Masaki Azuma of the Institute of Science Tokyo and KISTEC and Dr. Takumi Nishikubo, Visiting Assistant Professor at the Institute of Science Tokyo and Researcher at KISTEC. JMTC has entered into a joint research agreement with the Institute of Science Tokyo and KISTEC and is working on the development of an industrial manufacturing process for BNFO.



Going forward, JMTC will continue to expand the industrial applications of negative thermal expansion materials by further advancing mass production technologies, developing new grades tailored to customer needs, and exploring new applications.