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Japan Material Technologies Corporation

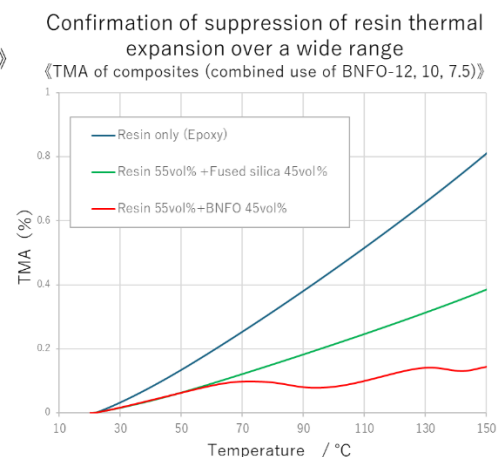
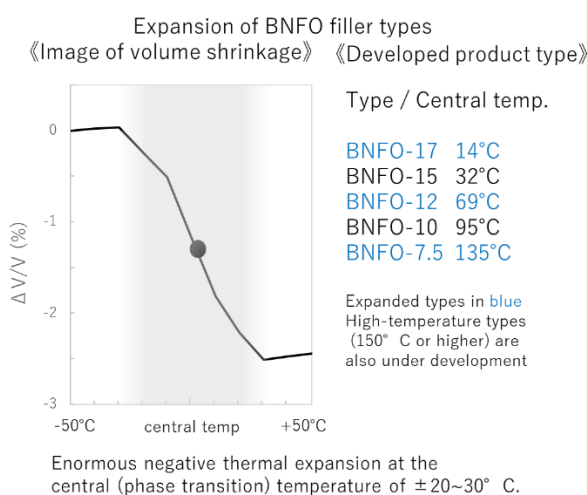
JMTC expands temperature range lineup of negative thermal expansion material BNFO

Thermal expansion control of resin enabled over a wide temperature range

Japan Material Technologies Corporation (Head Office: Chuo-ku, Tokyo; President: Koyu Urata; "JMTC") has expanded its lineup of negative thermal expansion material BNFO for different temperature ranges.

BNFO (BiNi_{1-x}Fe_xO₃ (bismuth nickel iron oxide)) is a material that exhibits enormous negative thermal expansion (thermal contraction) of 187 parts per million per degree of temperature rise in the phase transition temperature range, while many materials exhibit positive thermal expansion (thermal expansion). Many developments have been made to address thermal management issues to improve heat dissipation, but there are few existing options of materials that can control thermal expansion and can be mixed with resin. BNFO is a breakthrough material that can control thermal expansion of resin. Conventionally, the temperature range that could be handled was only around room temperature and around 90°C. However, we have succeeded in developing BNFOs that can operate at lower and higher temperatures, enabling thermal expansion control in any temperature range between 0°C and 150°C.

BNFO was invented by Professor Masaki Azuma and his team at the Tokyo Institute of Technology. JMTC signed a joint research agreement with said university and KISTEC to develop an industrial manufacturing process for BNFO. Since FY2022, JMTC has been working to scale up, develop new applications, and expand the product lineup under the "Go-Tech Program," a grant program by the Ministry of Economy, Trade and Industry (METI). Expansion of the lineup is a result of this effort. (Related press release: [JMTC's BNFO product development project has been selected for the METI grant](#)) Expected to be used in precision resin parts, conductive pastes, adhesives, etc., we are further developing particle sizes and temperature ranges for each application.



For inquiries about BNFO, please contact us through the inquiry form on the JMTC website (<https://www.jmtc.co.jp/en/>).