

BNFO negative thermal expansion material

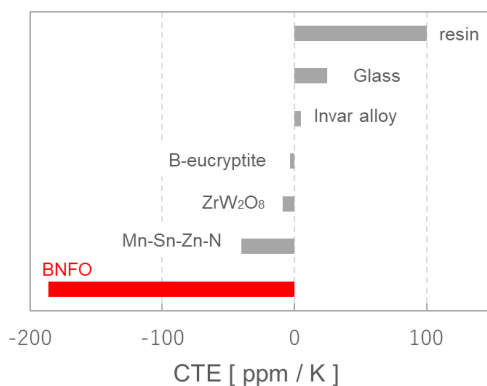
– $\text{BiNi}_{1-x}\text{Fe}_x\text{O}_3$ (bismuth · nickel · iron oxide) –

- Product** Oxide ceramic material showing negative thermal expansion
- Application** Joining component for dissimilar materials, precision processing component
- Feature** Greater negative thermal expansion (-187 ppm/K)

Feature :

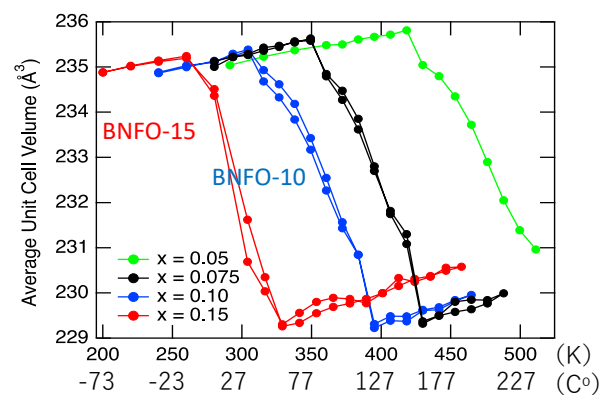
Greater negative CTE

Controls thermal expansion in small amount



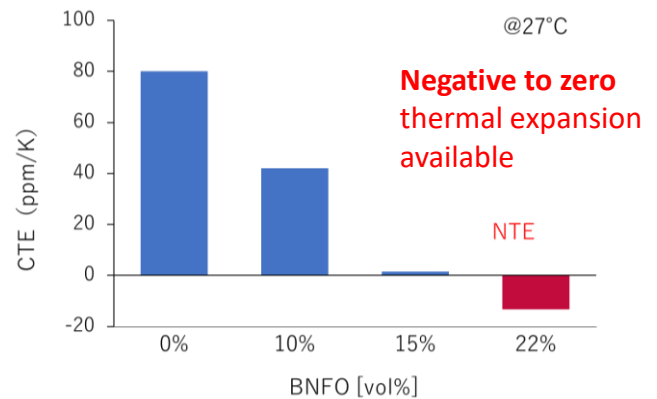
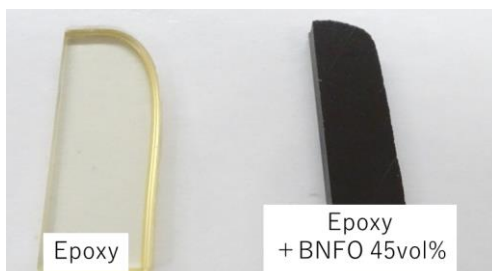
Selective operating temp.

2.6% of volumetric continuous shrinkage



Compositable

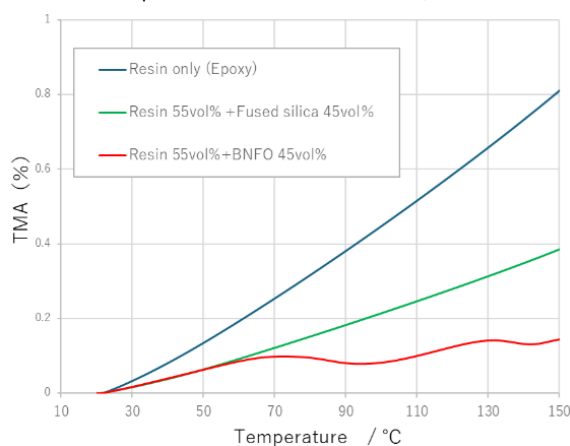
High compatibility with resin



Application :

《ex》 Epoxy-BNFO composite

Mixture of phase transition @ 70, 95 and 135 °C



Greater thermal expansion suppression effect.

- ◆ Improved dimensional accuracy
- ◆ Warp prevention
- ◆ Offsets resin expansion

Precision components

Dimensional accuracy

Precision Adhesives

Less warping, less filler additions

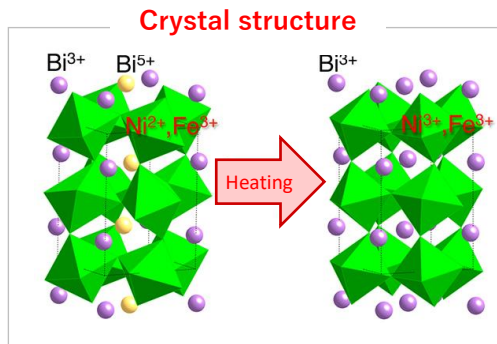
Conductive paste

Stability in high temperature

BACK-GROUND

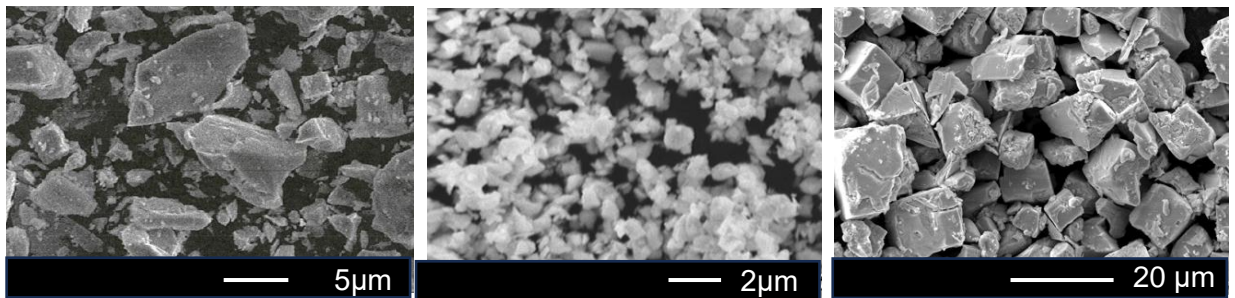
$\text{BiNi}_{1-x}\text{Fe}_x\text{O}_3$ (bismuth · nickel · iron oxide) "BNFO" was developed by team of Prof. Masaki Azuma, Science Tokyo (former Tokyo Institute of Technology). JMTC has concluded a joint R&D agreement with the team (Science Tokyo and Kanagawa Institute of Industrial Science and Technology) and is promoting commercialization of BNFO.

PRODUCT OVERVIEW



BNFO is oxide ceramic material with a perovskite structure and exhibits a negative linear coefficient of thermal expansion (-187ppm/K). It is expected to be used as filler to reduce CTE (coefficient of thermal expansion) or as material for sensor.

SEM



$D(50) \cong 5 \mu\text{m}$

※Various particle types are under development

Bulk Properties

Hardness	2.5 GPa
Specific gravity	9.04
Resistivity(RT/ 100°C)	5.04 / 0.03 $\Omega \cdot \text{cm}$
Dielectric constant (10MHz)	118
Loss tangent (10MHz)	1.25

※Measured value of BNFO-15 bulk , not guaranteed

Contact information