



三井金屬

改變熱膨脹的常識

一 三井金屬「負熱膨脹材料」

主要應用

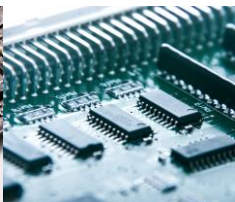
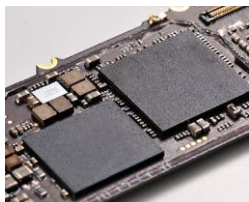
隨著溫度上升而收縮的材料，有助於抑制熱膨脹

Material that contracts as temperature rises, contributing to thermal expansion suppression

用途範例

半導體封止材、銅張積層板、各種樹脂部材

Semiconductor encapsulants, copper-clad laminates, and various resin components



特點

可輕鬆填充至基質中 / 樹脂、金屬、玻璃等

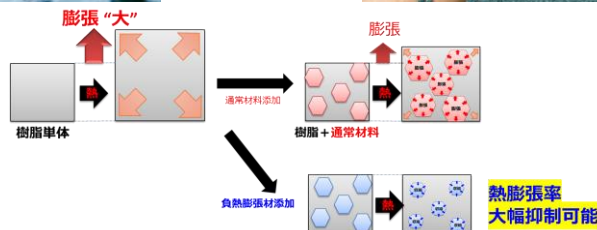
Easily dispersible into matrices — compatible with resins, metals, glass, and more

業界頂尖水準的CTE (ZMP : -66 ppm/K)

Industry-leading CTE performance (ZMP: -66ppm/K)

是否正為熱膨脹問題而煩惱呢？

• 由於材料間熱膨脹差異，導致裂縫、剝離與變形
Cracking, delamination, and deformation caused by thermal expansion mismatches between different materials.



使用三井金屬的「負熱膨脹材料」，問題迎刃而解！

Solve these challenges with Mitsui Kinzoku's Negative Thermal Expansion (NTE) Materials!

高收縮效果

High shrinkage effect

自由調整規格

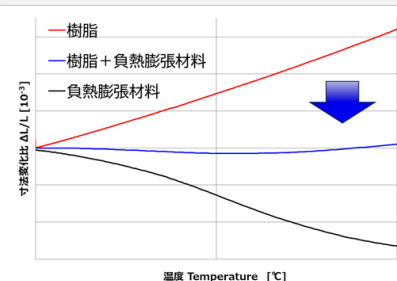
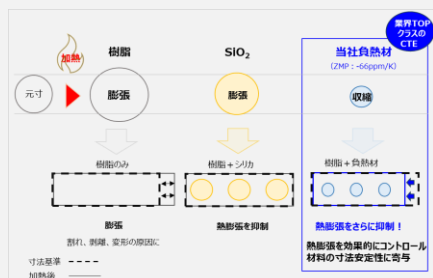
Flexible specification customization

涵蓋廣泛溫度範圍

Wide temperature range coverage

可添加於樹脂等易膨脹材料中，有效抑制熱膨脹

Thermal expansion can be effectively suppressed by adding materials that are prone to expansion, such as resins.

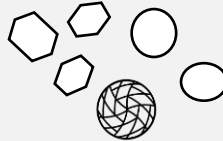


依客戶需求，可提供表面處理、粒徑、形狀控制等多樣化客製化服務

Customization options, including different surface treatments, particle sizes, and shapes to meet customer needs.

代表品種ZMP

<外觀写真>



相容各種形狀

■ 代表的物性 Typical properties

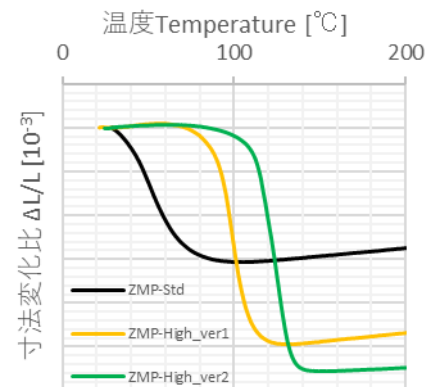
色 colour	比表面積 Specific surface area m ² /g	真密度 True density g/cm ³	粒度 Particle size		体積抵抗率 Volume resistivity Ω·cm
			D ₅₀ μm	D ₉₀ μm	
白色 White	2.0	3.7	4.6	7.6	1.3×10 ⁹

ZMP：由名古屋大學竹中教授發明的負熱膨脹材料

ZMP: A material with negative thermal expansion was invented by Professor Takenaka at Nagoya University.

ZMP：由名古屋大學竹中教授發明的負熱膨脹材料

Optimized solutions based on the target temperature range to minimize thermal expansion.



秉持探索精神，
融匯多樣技術，
讓地球綻放笑容。

