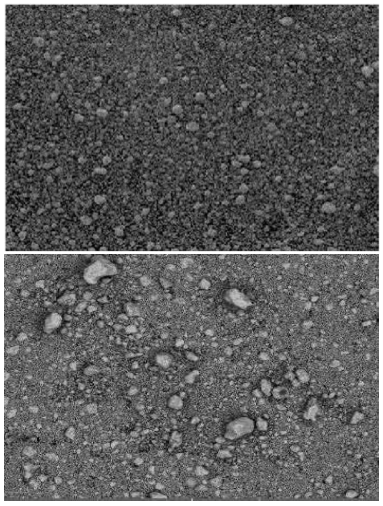
Near Zero Thermal Expansion Inorganic Fillers

SHINDURATHERM™

SHINAGAWA SHINDURATHERM™ powders are crystalline compounds of the formula LiAlSiO with near zero thermal expansion coefficients. SHINDURATHERM™ is added as a filler for lowering the coefficient of thermal expansion (CTE) of the matrix. SHINDURATHERM™ fillers provide specific advantages over other fillers. Possessing a very low CTE over a wide temperature range, SHINDURATHERM™ enables less filler loading for the same degree of CTE manipulation.



SHINDURATHERM™ powders are thermally stable and ROHS compliant.

SHINDURATHERM™ applications include epoxy, sealing glass, encapsulates, coatings, glazes and metal pastes. For over 50 years, SHINDURATHERM™ powders have enabled proven solutions in Aerospace, Military, Electronics, Automotive, Labware, and Building / Habitat markets.

The SEM images on the right show bi-modal particle size distribution of SHINDURATHERM™ powders.

PHYSICAL PROPERTIES		
	Grade 2121	**Grade 2122**
Particle Size	95%< 44 µm (- 325 mesh)	95%< 44 µm (- 325 mesh)
Horiba PSA D_{50} (light scattering)	2.8 +/- 1.0µm	2.8 +/- 1.0µm
Density		
Loose Bulk Density g/cc (lbs/ft^3)	0.64 (40)	0.67 (42)
Tapped Bulk Density g/cc (lbs/ft^3)	0.77 (48)	0.80 (50)
True Density (g/cc)	2.37 to 2.43	2.40 to 2.47
Thermal Stability	to 1260°C (2300°F)	to 1260°C (2300°F)
Coefficient of Thermal Expansion (1/°C)		
50°-200°C	-2.2×10^{-6}	1.2×10^{-6}
50°-500°C	-3.6×10^{-6}	N/A

To learn more about SHINDURATHERM™ and our products, please contact your SHINAGAWA representative.

All of the above statements, recommendations, suggestions and data concerning the subject material are based on laboratory and field results, and although we believe the same to be reliable, we expressly do not represent, warrant or guarantee the accuracy, completeness or reliability of same, of the material, or the result to be obtained from the use thereof. Nor do we warrant that any such use, either alone or in combination with other materials, shall be free of the rightful claim of any third party by way of **INFRINGEMENT** or the like, and **SHINAGAWA SPECIALTY CERAMICS AMERICAS, LLC DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

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