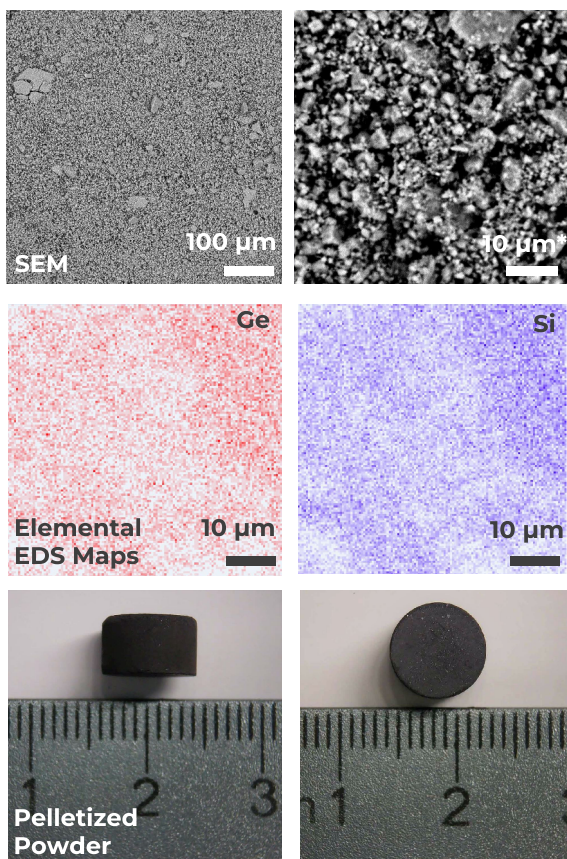


#### Si40Ge (40% Germanium Silicon Alloy Powder)

#### Typical Morphology and EDS Maps of Mechanically Alloyed Ge-Si

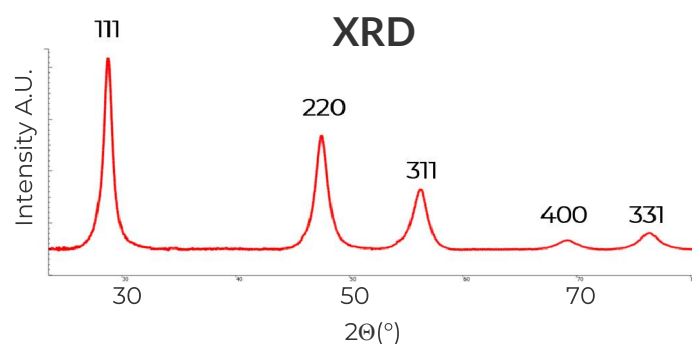


\*SEM (BSD) Image corresponding to Elemental EDS Maps

Due to its high mechanical strength, ability to operate at high temperature while maintaining electronic stability, as well as a high resistance to oxidation, Silicon-Germanium has been the material of choice in thermoelectric devices being deployed in the most extreme environments.

This material's unique properties in transistor applications show improved performance in low-current and high-frequency regimes with compositionally and structurally tunable band-gap energies. Work with this material has demonstrated practicality in additive manufacturing with great potential to scale based on customer needs.

This mechanically alloyed powder material is available in bulk, and may be manufactured into parts via powder metal-based processes, such as spark plasma sintering. Compositional analogs available upon request.



## MATERIAL INFORMATION

TEST	RESULTS**	NOTES
Tap Density	0.834 g/ml	
Specific Gravity (Pycnometer)	3.0190 ± 0.0401 g/cm <sup>3</sup>	
Powder Size (PSA)	D <sub>10</sub> [μm] 0.7200 D <sub>50</sub> [μm] 3.243 D <sub>90</sub> [μm] 33.88	Mean size [μm] 11.658 Span 10.220 D [5,3] [μm] 22.627 Fit error 0.0219
Surface Area (BET)	6.26557 m <sup>2</sup> /g	
Crystal Structure	Mechanically alloyed Si/Ge crystal structure indexed to SG227	No elemental Ge or Si is present in the pattern

\*\*Actual results may vary