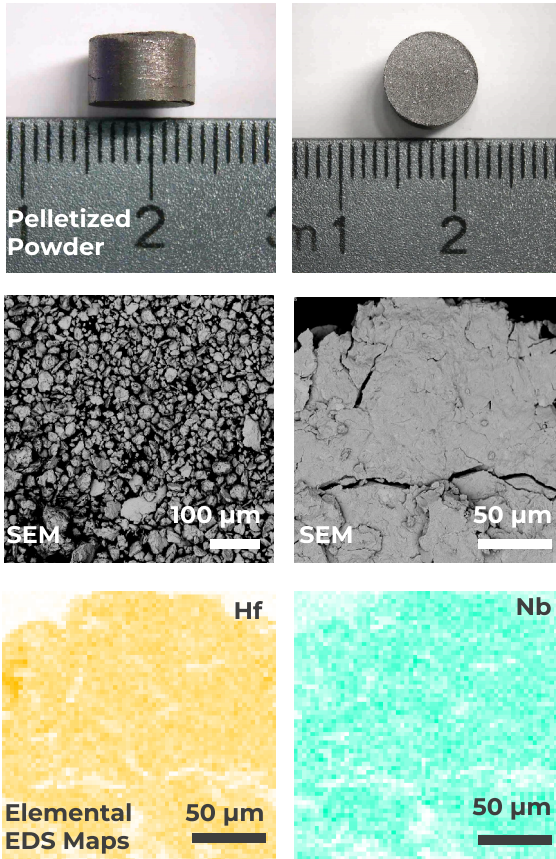


Typical Morphology and EDS Maps of Mechanically Alloyed Hf, Nb, Ta, Ti, Zr



When sintered, High Entropy Alloy (HEA) has produced parts with an exceptional combination of high strength and ductility. Alloys with single bcc and dual phase structures have been shown to exhibit combinations of strength, ductility and fracture toughness close to and exceeding high strength steels and nickel superalloys.

Handling Recommendations: Store received material in the original container in a dry location. Open containers should be stored in an inert environment such as a glove box.

This powder material is available in bulk and can be used to produce full-scale solid components via powder metal-based processes. The standard composition (100g, 500g, and 1kg packaging) includes 20% of each Hf, Nb, Ta, Ti, and Zr. Other compositions are available upon request.

MATERIAL INFORMATION

TEST	RESULTS**	NOTES
Tap Density	4.334 g/ml	
Specific Gravity (Pycnometer)	9.6497 g/cm ³	
Powder Size (PSA)	D ₁₀ [μm] 4.657 D ₅₀ [μm] 22.576 D ₉₀ [μm] 59.046	Mean size [μm] 29.554 Span 2.409 D [5,3] [μm] 37.619 Fit error 0.00084
Surface Area (BET)	0.167 m ² /g	
Crystal Structure	Amorphized bcc	(Supplementary details available upon request)

**Actual results may vary