

ADDITIVE MANUFACTURING PRODUCTS

Nb – Hf – Ti Alloy C103 AM Powder

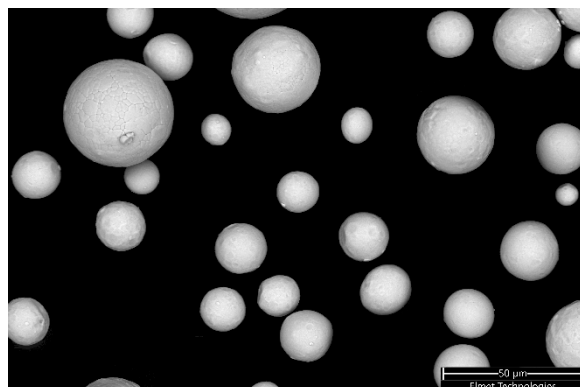
Elmet Technologies produces C103 niobium alloy powder for laser powder bed fusion (L-PBF) and directed energy deposition (DED) additive manufacturing processes. The powder exhibits low oxygen content, excellent flowability, and high apparent and tap densities. C103 niobium alloy powder is well-suited for rocket and jet propulsion applications utilized in spacecraft and launch vehicles. A key advantage of the niobium alloy is its high strength at temperatures up to 2700 °F (1482 °C). Elmet Technologies' C103 niobium alloy also has excellent resistance to high frequency vibrations at cryogenic temperatures, as occurs in many satellite applications, because of its low ductile-to-brittle transition temperature.

CHEMICAL CHARACTERISTICS¹

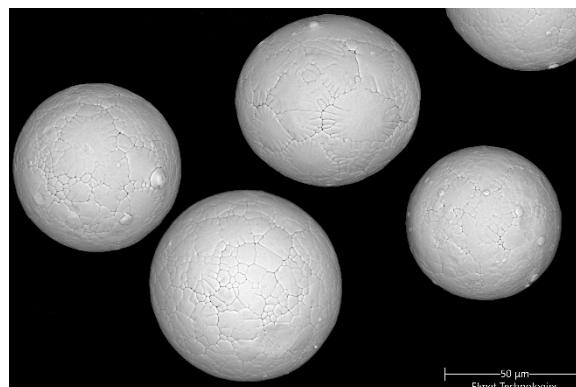
Element	Percent %
Nb	88 min
Hf	9 – 11
Ti	0.7 – 1.3
Ta	0.5 max
W	0.5 max
Zr	0.7 max
C	< 0.015
O	< 0.05

PHYSICAL CHARACTERISTICS¹

Property	L-PBF	DED
Bulk density, g/cc	>4.5	>4.5
Flow, s/50g	<15	<17
PSD, d10, µm	>10	>40
PSD, d90, µm	<53	<150



Typical morphology of L-PBF size powder



Typical morphology of DED size powder

¹ Information on testing methods on request.

CUSTOMIZATION

Inquiries regarding custom particle size and chemistry are welcome.

PACKAGING

The TZM AM powder is packaged in polyethylene bottles with desiccant. Special packaging inquiries are welcome.

Hazards identification in Advertising (Directive 67/548/EEC Article 26 and Directive 1999/45/EC Article 13) none.

IDENTIFICATION

The material will be identified with appropriate specification number, batch number, and nominal size. Shipping containers will be marked with the name of the customer and the purchase order number.

REJECTION

Elmet Technologies must receive written notification of rejected material with the reason for rejection. The right is reserved to inspect rejected material at customer plant for claim validation. The material may be returned only after proper authorization.



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