

## Niobium C-103 Spherical Powder

Our C-103 spherical powder is composed of niobium, hafnium and titanium, giving it high temperature and load-bearing characteristics while still being relatively easy to work with when compared to other materials. C-103 provides a high-performance alloy solution for aerospace, spacecraft, missiles and launch vehicles. The spherical powder form is available for additive manufacturing when complex shapes are desired. Niobium has the lowest density of the refractory metals and exhibits excellent thermal conductivity, high room-temperature ductility and low ductile-to-brittle transition temperature (giving it resistance to high frequency vibrations at cryogenic temperatures).

### Chemical Composition

Element	Composition (wt%)
Titanium	0.7 – 1.3
Hafnium	9 - 11
Zirconium	<0.7
Tungsten	<0.5
Tantalum	<0.5
Molybdenum	<0.005
Aluminum	<0.005
Silicon	<0.0075
Nickel	<0.005
Tin	<0.01
Copper	<0.0025
Vanadium	<0.003
Oxygen	<0.05
Nitrogen	<0.01
Carbon	<0.002
Chromium	<0.01
Iron	<0.01
Hydrogen	<0.001
Niobium	Balance

## Typical Physical Properties

Nominal PSD ( $\mu\text{m}$ )	D10 ( $\mu\text{m}$ )	D50 ( $\mu\text{m}$ )	D90 ( $\mu\text{m}$ )	Hall Flow	Apparent Density
+15 $\mu\text{m}$ /-53 $\mu\text{m}$	20 - 30	30 - 40	40 - 50	<20	<7

## Forms Available

The standard particle size of our niobium C-103 spherical powder is +15 $\mu\text{m}$ /-53 $\mu\text{m}$ . Additional sizes are available on request. Niobium C-103 is also available in plate, sheet, bar and rod. For specialized use cases, we can help address specific issues by collaborating with customers to fabricate and machine components for the aerospace industry, including build-to-print and design.

## Related Information

The ingots used to make Materion's niobium C-103 spherical powder meet ASTM B652.

### Disclaimer:

Only the buyer can determine the appropriateness of any processing practice, end-product or application. Materion does not make any warranty regarding its recommendations, the suitability of Materion's product, or its processing suggestions for buyer's end product, application or equipment.

The properties presented on this data sheet are for reference purposes only, intended only to initiate the material selection process. They do not constitute, nor are they intended to constitute, a material specification. Material will be produced to one of the applicable industry standards, if any, listed in the Industry Standards and Specification section.

Actual properties may vary by thickness and/or part number. Please contact your local sales engineer for detailed properties to be used in simulation.

Any properties marked as preliminary are subject to change at any time as the manufacturing process is further refined.