

Material Data Sheet: Pt-Rh10 powder for Laser Power Bed Fusions (LPBF)



Powder specification data

Powder Chemical composition [wt.%]	95.5% Pt & 4.5 Ru%
Particle size d50	30µm
Particle size d90	70 µm
Basic Flowability Energy	1851.33 mJ
Application	LPBF
Atomization	Argon Gas Atomized

Material description

Pt-Rh10 alloy comprises platinum mass fraction up to 90% alloyed with 10% Rhodium. Alloys of platinum with rhodium has unique high temperature strength with exceptional corrosion and oxidation resistance up to high temperatures making them ideal for production of structural components at high temperatures in oxidative atmospheres. Platinum alloys are used widely in industrial applications such as in glass-fibre manufacturing process and in space application technology.

Alloys of platinum with rhodium have proved to be the optimum choice for bushing plate for the manufacture of textile glass fibres because of their unique combination of high temperature strength with excellent resistance to oxidation by the surrounding air and corrosion resistance to the molten glass. Their simultaneous creep resistance and outstanding chemical stability, oxidation resistance and resistance to many molten oxides make them superior compared to the use of other refractory metals: tantalum, niobium, tungsten, molybdenum and rhenium for use at high temperature applications.

Material properties	Applications
High temperature strength	Glass industry
High corrosion resistance	Aerospace and defence
High melting point of (1770°C)	Nitric industry
Good ductility at extremely high temperatures	Plungers, stirrers, thermo-elements and laboratory equipment

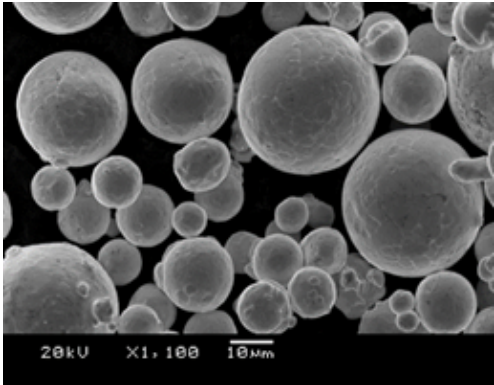


FIGURE 1—SEM IMAGE OF TYPICAL Pt-Rh POWDER

Mechanical Properties of additively manufactured components

Part Density	19.69 g/cm3
Ultimate tensile strength (MPa)	393.14 ± 11.02
Elongation @ break	31.52%
Hardness (Vickers)	132.7 ± 6.78
Porosity %	0.03%
Heat treated- Yield strength (MPa)	265.55
Heat treated- Elongation @ Break	41.55%
Oxidation rate (weight loss % during 20 hr @ 1550°C)	0.1