CNPC POWDER

3D PRINTING POWDERS

About Us

CNPC POWDER is a global enterprise focused on advanced metal powder materials for additive manufacturing (AM), metal injection molding (MIM), and other high-end manufacturing applications. With over 15 years of expertise in materials science and process engineering, the company specializes in the R&D and industrialization of micron- and nano-scale metal powders, including aluminum, titanium, iron, nickel, copper, and precious metal (silver) powders, serving aerospace, automotive, electronics, medical, robotics, and new energy industries.

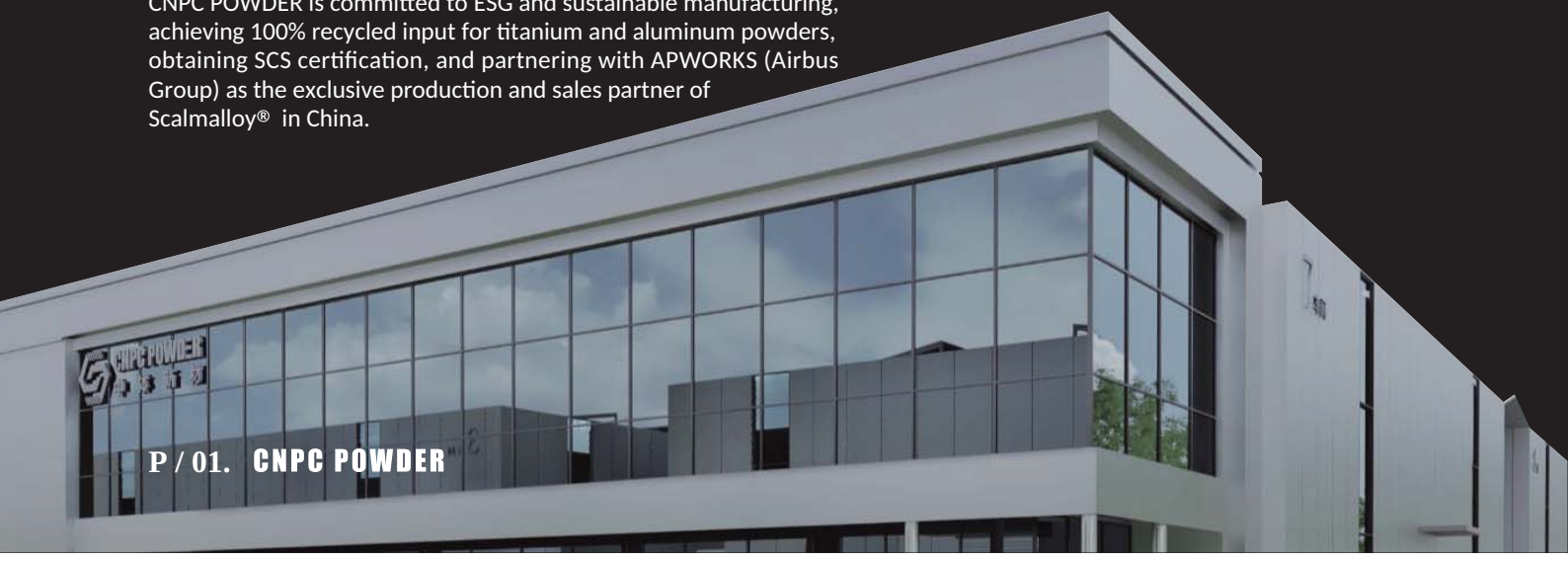
Driven by continuous technological innovation, CNPC POWDER operates multiple advanced powder production technology platforms, including EIGA, VIGA, PREP, and plasma spheroidization (PS), and self-developed AMP production lines. Its powders are characterized by high sphericity, low satellite content, high yield, and consistent quality, and are co-developed with global customers for advanced alloy applications.

The company is recognized as a National High-Tech Enterprise and a "Little Giant" specialized innovation enterprise, and holds certifications including ISO 9001, ISO 14001, ISO 45001, ISO 13485, IATF 16949, and GJB 9001C-2017.

CNPC POWDER is committed to ESG and sustainable manufacturing, achieving 100% recycled input for titanium and aluminum powders, obtaining SCS certification, and partnering with APWORKS (Airbus Group) as the exclusive production and sales partner of Scalmalloy® in China.

The company operates a 26,000 m² production base in Anhui, China, with a planned expansion to 177,000 m² and 50 production lines by 2027, adding over 8,000 tons of annual capacity. It has subsidiaries in Shanghai, Germany, and the United States, forming a global network.

The Shanghai R&D Center will integrate AI-driven material design for customized alloy development, while the U.S. facility in Los Angeles provides AMP/EIGA-based production and localized support for North America.



Global Layout

A World-Leading Innovation & Manufacturing Platform

R&D, Production, Sales and Supply Chain Collaboration
Accelerate the Development of Next-Generation Additive Manufacturing Alloy Materials

Shanghai, China

- Materials and Process R&D Center
- International Business and Logistics Center
- AI Development and Digital Applications
- Intellectual Property and Standard Formulation

R&D Conversion
Pilot Verification

Demand Feedback
Closed-Loop Optimization

Anhui, China

- 8,000-tonne Smart Factory
- Global Supply Chain Hub
- Cost and Quality Advantages
- Technology Transfer & Scaled Manufacturing

Technical Collaboration
Process Feedback

Capacity Collaboration
Supply Complementarity

California, USA

- New Production Plant for Metal Alloys Powders in the US
- Sales and Customer Support
- 48-Hour Fast Delivery Across North America
- R&D and Application Collaboration (US-Based Interface)

Technical Collaboration
Certification Implementation

Channel Collaboration
Inventory Optimization

Frankfurt, Germany

- European Warehousing and Distribution Center
- Customer Development and Agent Network
- EU Regulatory Compliance and CE Certification Support
- Inventory Optimization and Logistics Hub

Globalization

1000 +	50 +	200,000 + M²	2500 + M²	50 +
Global Customers	Served Countries	Modern Factory	R&D and Business Center	Production Lines

Global Market

Europe, North America, Asia, and the Middle East, etc.

Lightweight and High-Strength Alloy Powder | Scalmalloy®

Material Characteristics

Scalmalloy ® is a high-strength 3D printing aluminum alloy developed and commercially applied by APWORKS, a subsidiary of Airbus Group. It features excellent mechanical properties including high strength and fracture toughness, as well as advantages such as low density, corrosion resistance, and suitability for anodizing.

Excellent Strength Properties | Excellent Toughness | Superior Mechanical Properties | Low Density Advantage | Superior Corrosion Resistance

Application Fields

Aerospace, automotive, consumer electronics, robotics, low-altitude economy, and other high-end manufacturing fields requiring high strength and lightweight design.

Composition%

Sc	Mg	Zr	Mn	O	Al
0.68–0.88	4.5–5.1	0.2–0.5	0.3–0.8	≤ 0.1	Bal.

Physical Properties

20–63 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
15–30	30–45	55–70	–	–	–	–

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Conductivity (%IACS)	Hardness (HV1)	Thermal Conductivity (W/(m · K)
Printing	≥ 418	≥ 231	≥ 10	19.0	125	83
Heat Treated 350°C,8h	≥ 539	≥ 509	≥ 8	25.0	165	116

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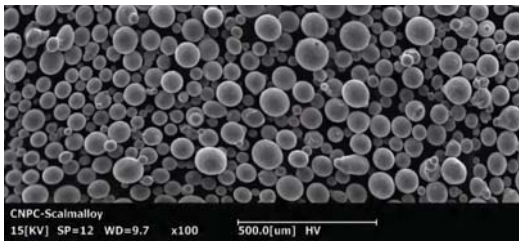
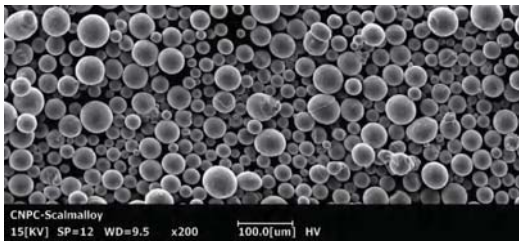
SEM Micrograph





Lightweight Alloy Powder | CNPC-AlSi10Mg

Material Characteristics

Low density, excellent specific strength, good wear resistance, strong corrosion resistance, high electrical and thermal conductivity.

Low Density Advantage | Superior Specific Strength | Superior Wear Resistance | Superior Corrosion Resistance | Superior Electrical and Thermal Conductivity

Application Fields

Consumer electronics, components, aerospace, automotive, robotics and marine manufacturing.

Composition%

Si	Mg	Al
9.0–11.0	0.25–0.45	Bal.

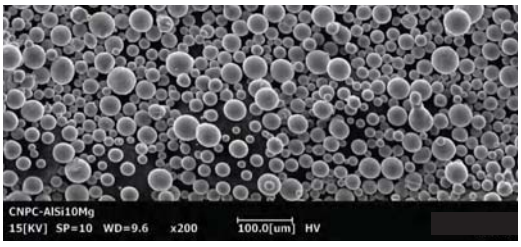
Physical Properties

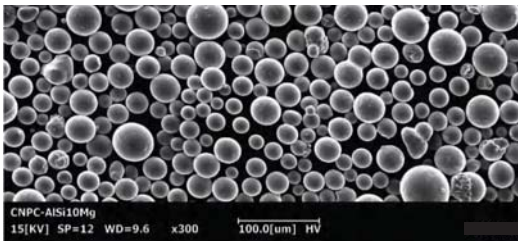
20–63 μm Laser Particle Size Distribution of Powder (μm)			Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Sphericity (%)
D10	D50	D90	≤ 0.1	≥ 1.1	≥ 1.3	≤ 90	≥ 90
15–30	30–45	55–70	–	–	–	–	–

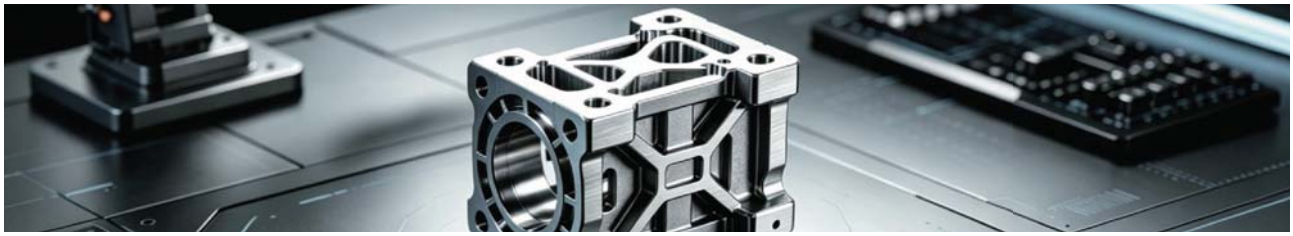
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)	Relative Density (%)	Porosity (%)	Thermal Conductivity (W/(m · K)
Printing	≥ 420	≥ 350	≥ 7.0	127.0	23.2	99.94	0.06	103.0
Heat Treated 250°C ,2h	≥ 340	≥ 250	≥ 10	100.0	43.1	–	–	181.5

SEM Micrograph







Lightweight and High-Strength Alloy Powder | CNPC-AlCe0.6ScZr

Material Characteristics

It has the characteristics of high strength, high hardness, excellent heat resistance and corrosion resistance, and is stable and durable in extreme environments.

Superior High Strength and Hardness

Superior Heat and Corrosion Resistance

Durable Stability in Extreme Environments

Application Fields

Low-cost high-strength aluminum is suitable for lightweight fields such as aerospace and automotive manufacturing.

Composition%

Ce	Sc	Zr	Al
9.0–11.0	0.5–0.7	0.2–0.4	Bal.

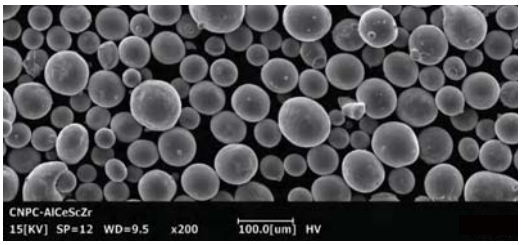
Physical Properties

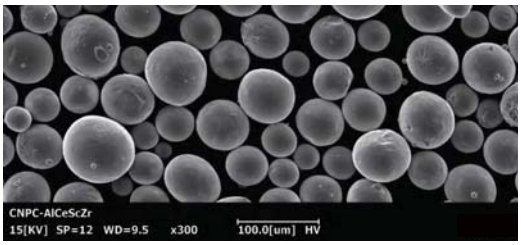
20–63 μm Laser Particle Size Distribution of Powder (μm)			Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90	≤ 0.1	≥ 1.1	≥ 1.3	≥ 90
15–30	30–45	55–70	—	—	—	—

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)	Relative Density (%)	Porosity (%)
Printing	≥ 377	≥ 347	≥ 10	124	24.2	99.95	0.05
Heat Treated 300°C,1h	≥ 534	≥ 493	≥ 9	167	31.5	—	—

SEM Micrograph





Lightweight and High-Strength Alloy Powder | CNPC-AlMgMnZr

Material Characteristics

It has high strength, good plasticity and toughness, and can maintain good formability and impact resistance under complex stress conditions.

Excellent Strength Properties

Excellent Toughness

Superior Impact Resistance

Application Fields

Low-cost high-strength aluminum is suitable for lightweight fields such as aerospace and automotive manufacturing.

Composition%

Fe	Mg	Zr	Mn	O	Al
≤ 0.5	2.5–3.2	1.4–1.8	0.4–0.9	≤ 0.1	Bal.

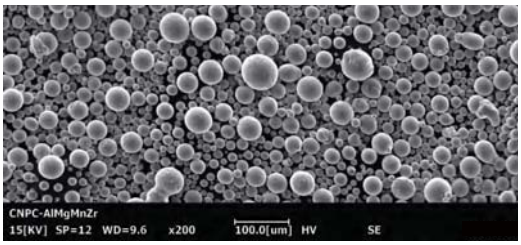
Physical Properties

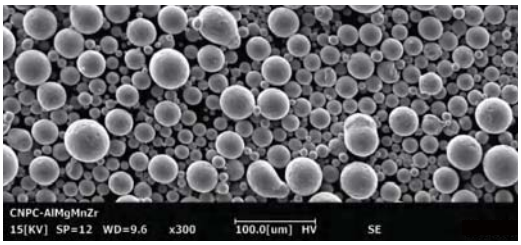
20–63 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90	≤ 90	≥ 1.1	≥ 1.3	≥ 90
15–30	30–45	55–70	–	–	–	–

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)
Printing	≥ 335	≥ 283	≥ 15	100	18.1
Heat Treated 350°C,4h	≥ 461	≥ 430	≥ 13	135	28.5

SEM Micrograph





Lightweight and High-Strength Alloy Powder | CNPC-Al6061Zr

Material Characteristics

Based on 6061 aluminum alloy and containing Zr element, it has high strength, good toughness and corrosion resistance, excellent fluidity and formability, as wellas relatively good thermal and electrical conductivity.

Excellent Strength Properties | Excellent Toughness | Superior Corrosion Resistance | Excellent Flowability | Superior Electrical and Thermal Conductivity

Application Fields

It is suitable for applications in aerospace, automotive manufacturing, electronics, mold manufacturing and other related fields.

Composition%

Mg	Si	Fe	Cr	Zr	Zn	Al
0.8–1.2	0.4–0.8	≤ 0.7	0.04–0.35	≤ 1.5	≤ 0.25	Bal.

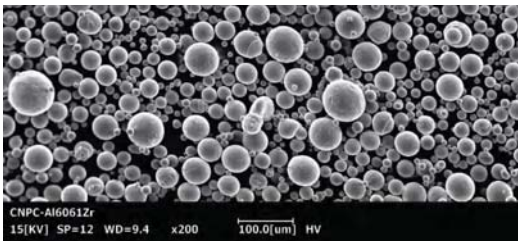
Physical Properties

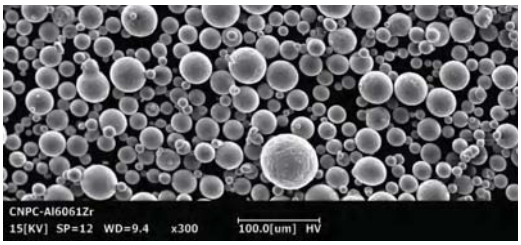
20–63 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm^3)	T.D. (g/cm^3)	Sphericity (%)
D10	D50	D90				
≤ 90	≥ 1.1	≥ 1.3	≥ 90			
15–30	30–45	55–70	—	—	—	—

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)	Relative Density (%)	Porosity (%)	Thermal Conductivity (W/(m · K)
Printing	≥ 265	≥ 242	≥ 25	75	27.6	99.9	0.1	116
Heat Treated 350°C ,8h	≥ 345	≥ 306	≥ 20	114	36.7	—	—	185

SEM Micrograph





Lightweight Alloy Powder | High Electrical & Thermal Conductivity Aluminum Alloy Powder CNPC-Al0407

Material Characteristics

This 3D printing aluminum alloy powder combines high electrical and thermal conductivity with excellent mechanical properties. Optimized through material formulation and processing, it delivers electrical conductivity >47% IACS and thermal conductivity up to 200 W/(m·K). Excellent flowability and formability allow for high-precision, complex-structure forming, and it is compatible with leading 3D printing processes such as SLM and EBM.

Application Fields

Electronics and telecommunications, new energy industry, aerospace, and other high-end manufacturing sectors.

Superior Electrical and Thermal Conductivity

Superior Mechanical Properties

Excellent Flowability

Excellent Process Performance

Composition%

Ce	Ni	Al
0.1–1	0.5–1.5	Bal.

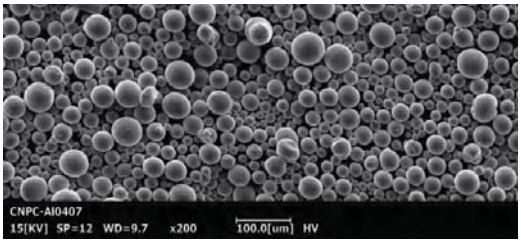
Physical Properties

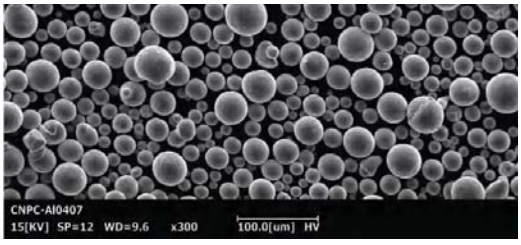
20–63 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)
D10	D50	D90			
≤ 100	≥ 1.3	≥ 1.5			
15–30	30–45	55–70	–	–	–

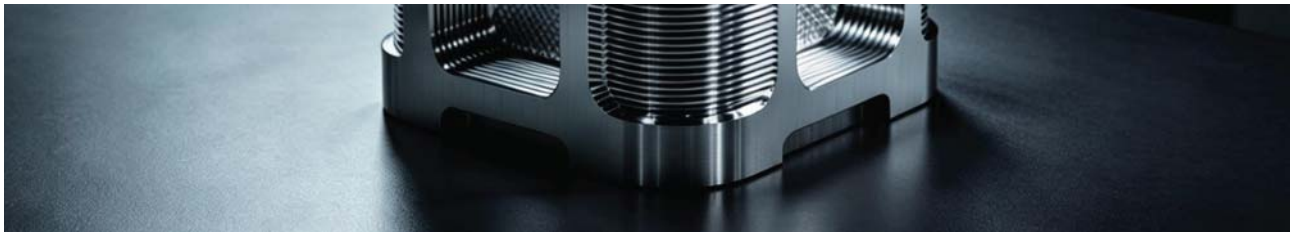
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)	Relative Density (%)	Porosity (%)	Thermal Conductivity (W/(m · K)
Printing	≥ 248	≥ 125	≥ 6.5	74.6	47.5	99.9	0.04	185
Heat Treated 250°C ,2h	≥ 227	≥ 184	≥ 9.5	69.7	49.0	99.9	0.04	190

SEM Micrograph







Lightweight and High-Strength Alloy Powder | Flame-Retardant Magnesium Alloy Powder CNPC-AZX912

Material Characteristics

Flame-retardant magnesium alloy powder AZX912 exhibits high flame retardancy, excellent mechanical properties, low density, good corrosion resistance, and machinability.

Superior Flame Retardancy | Superior Mechanical Properties | Low Density Advantage | Superior Corrosion Resistance

Application Fields

Aerospace industry, automotive industry, electronics and communication fields, military equipment.

Ignition Sensitivity

Lower explosive limit: 25–30 g/m^3 (very low)
Minimum ignition energy: 10–20 mJ (low)
Minimum ignition temperature of dust cloud: 620℃

Explosion Severity

Maximum explosion pressure of dust sample: 0.58 MPa (moderate hazard level)

Explosion index: 5 MPa·m·s^{-1} (classified as St1 level, indicating relatively low explosion hazard for dust)

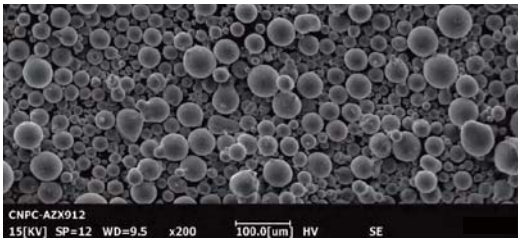
Composition%

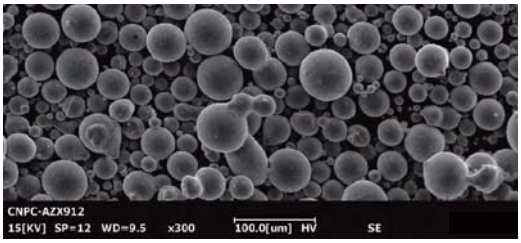
Al	Zn	Mn	Cu	Mg
9.0–9.5	0.5–0.7	0.3–0.4	2.0–2.5	Bal.

Physical Properties

30–90 μm Laser Particle Size Distribution of Powder (μm)			Oxygen (%)	A.D. (g/cm^3)	T.D. (g/cm^3)	Particle Size Range (μm)
D10	D50	D90	≤ 0.2	≥ 0.9	≥ 1.1	30–90
≈ 27	≈ 50.5	≈ 87.8	—	—	—	—

SEM Micrograph





Lightweight and High-Strength Alloy Powder | Green Recycled Titanium Alloy Powder CNPC-Ti6Al4V

Material Characteristics

Adopting a scrap recycling process halves costs while delivering performance comparable to virgin powder, with carbon emissions only 10% of those from traditional manufacturing.

Innovative Process Powder Manufacturing Process

10%

Carbon Emission Only 10% of the Traditional EIGA Process

SCS Certification 100% Green Recyclable Material

Application Fields

Aerospace, consumer electronics, medical, military, and other fields.

Composition%

Al	V	Fe	O	Ti
5.5–6.5	3.5–4.5	≤ 0.25	≤ 0.13	Bal.

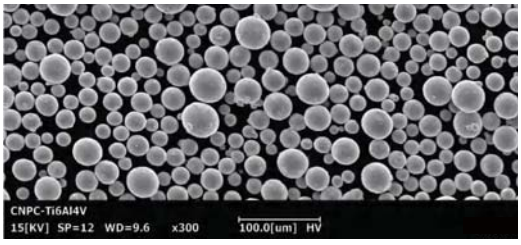
Physical Properties

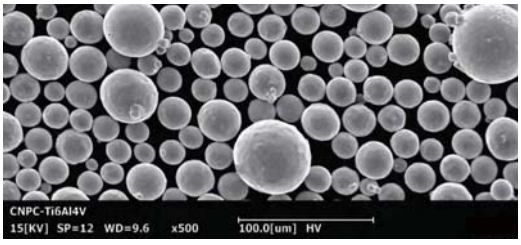
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
18–28	30–45	45–65	—	—	—	—

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 1171	≥ 1154	≥ 7	334	99.93	0.07
Heat Treated 800°C,2h	≥ 1022	≥ 905	≥ 10	310	—	—

SEM Micrograph





Lightweight and High-Strength Alloy Powder | Titanium Alloy Powder CNPC-TB8

Material Characteristics

Titanium alloy exhibits strong corrosion resistance, excellent heat resistance, low elastic modulus, and non-magnetic properties. After solution treatment and aging strengthening, its strength far exceeds that of high-strength aluminum alloys, magnesium alloys, and high-temperature alloys, even comparable to ultra -high-strength steel.

Superior Corrosion Resistance | Superior Heat Resistance | Low Elastic Modulus | Non-magnetic

Application Fields

Aerospace, national defense and military, shipbuilding, biomedical, and automotive industries.

Composition%

Al	Fe	Mo	Nb	O	Ti
2.5–3.5	≤ 0.3	14–16	2.4–3.2	≤ 0.3	Bal.

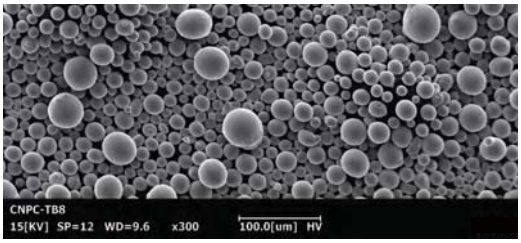
Physical Properties

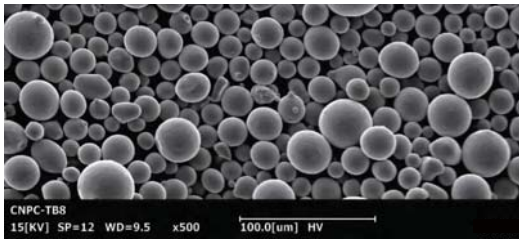
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
18–28	30–45	45–65	–	–	–	–

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 936	≥ 895	≥ 11	275	99.94	0.06
Heat Treated 815°C,1h+540°C,8h	≥ 1577	≥ 1530	≥ 3.5	457	–	–

SEM Micrograph





High-Strength High-Conductivity Copper Alloy Powder | Copper Alloy Powder CNPC-CuCrZr

Material Characteristics

CuCrZr offers high strength and hardness, excellent electrical and thermal conductivity, superior wear resistance, and exceptional powder spreadability for high-quality printing performance.

Superior High Strength and Hardness

Superior Electrical and Thermal Conductivity

Superior Wear Resistance

Application Fields

Electronics Manufacturing: Electronic components (e.g., connectors, heat exchangers)
Aerospace Industry: Heat exchangers and engine components
Automotive Industry: Radiators, fuel injectors, and sensors
Medical Devices: Various medical equipment components

Composition%

Cr	Zr	Fe	Si	O	Cu
0.5–1.5	0.02–0.50	≤ 0.15	≤ 1.0	≤ 0.1	Bal.

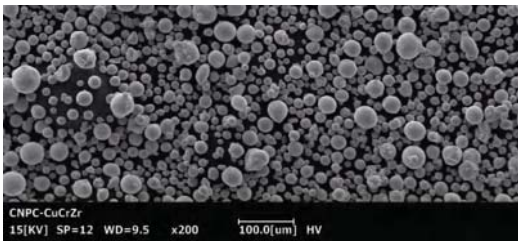
Physical Properties

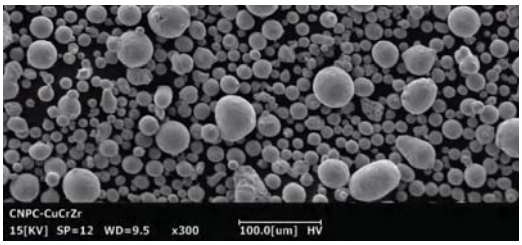
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
15–25	25–40	50–60	–	–	–	–

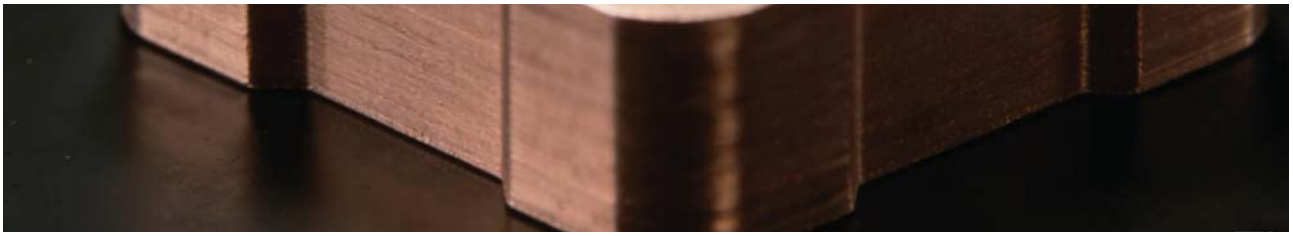
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Conductivity (%IACS)	Thermal Conductivity (W/(m · K)	Relative Density (%)	Porosity (%)
Heat Treated 600°C,2h	≥ 541	≥ 447	≥ 16	186	74.5	321	99.8	0.02

SEM Micrograph







High-Strength High-Conductivity Copper Alloy Powder | High-Purity Copper Powder

Material Characteristics

Pure copper itself possesses extremely high electrical conductivity and can rapidly conduct heat, making it suitable for the manufacturing of components that require high performance in electrical and thermal conductivity.

Superior Electrical and Thermal Conductivity

Application Fields

Aerospace, electronics, thermal management, molds, and other high-end manufacturing fields.

Composition%

Cu
≥ 99.7

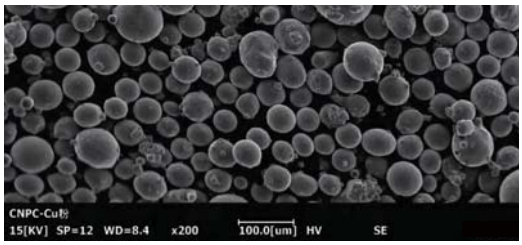
Physical Properties

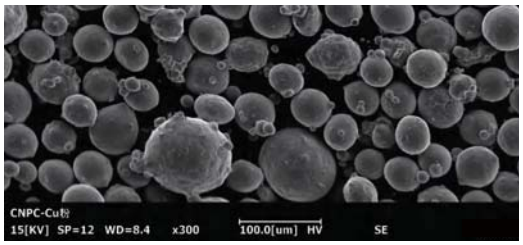
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)
D10	D50	D90	≤ 20	≥ 4.0	≥ 5.0
10–25	25–40	40–60	–	–	–

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Conductivity (%IACS)
Heat Treated Room temperature	≥ 400	≥ 340	≥ 22	98

SEM Micrograph





Iron Based Alloy Powder | Stainless Steel Powder CNPC-316L

Material Characteristics

Excellent corrosion resistance, particularly outstanding pitting corrosion resistance, and superior work hardening performance.

Superior Corrosion Resistance

Superior Work Hardening Performance

Application Fields

Mold manufacturing, aerospace, medical devices, petrochemical industries, and other fields.

Composition%

Cr	Ni	C	Mo	O	Fe
16.0–18.0	10.0–14.0	≤ 0.03	2.0–3.0	≤ 0.1	Bal.

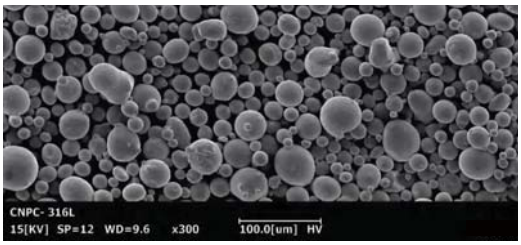
Physical Properties

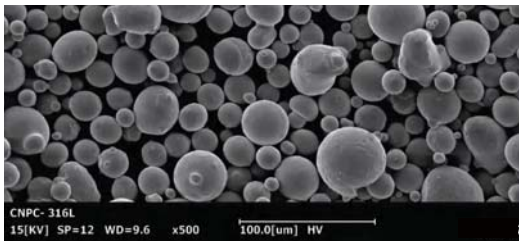
15-53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
≤ 20	≤ 20	≤ 20	≤ 20	≥ 3.5	≥ 4.0	≥ 80
10–25	25–40	40–60	–	–	–	–

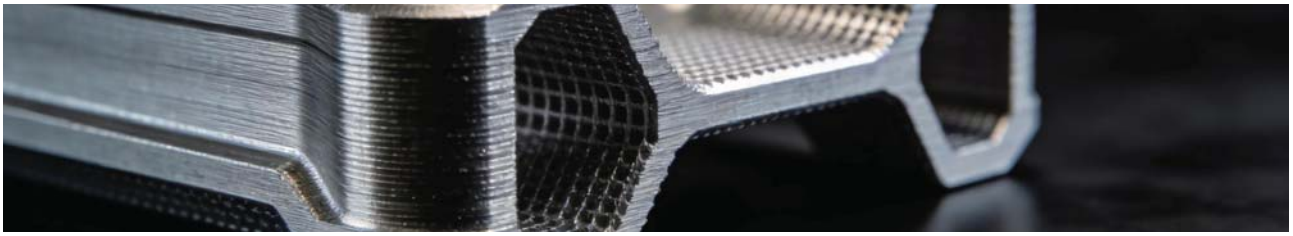
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 514	≥ 269	≥ 36	175	99.95	0.05
Heat Treated 1000°C,45min	≥ 745	≥ 366	≥ 28	245	–	–

SEM Micrograph







Iron Based Alloy Powder | Stainless Steel Powder CNPC-17-4PH

Material Characteristics

High strength, high toughness, excellent corrosion resistance, high oxidation resistance, good formability, and weldability.

Application Fields

Metal injection molding, hot isostatic pressing, etc.

Excellent Strength Properties

Excellent Toughness

Superior Corrosion Resistance

High Oxidation Resistance

Composition%

Cr	Ni	Cu	Nb	O	Fe
15.5–17.5	3.0–5.0	3.0–5.0	0.15–0.45	≤ 0.1	Bal.

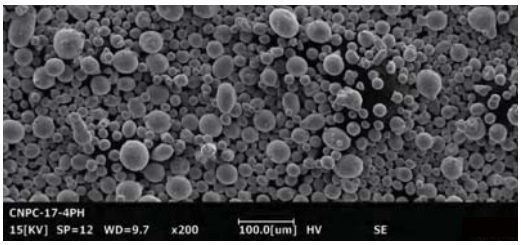
Physical Properties

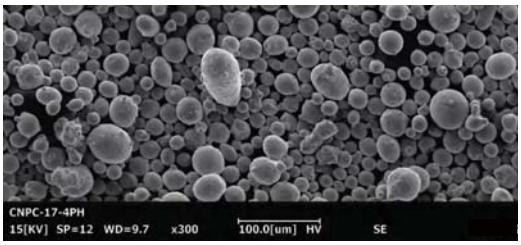
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
10–25	25–40	40–60	–	–	–	–

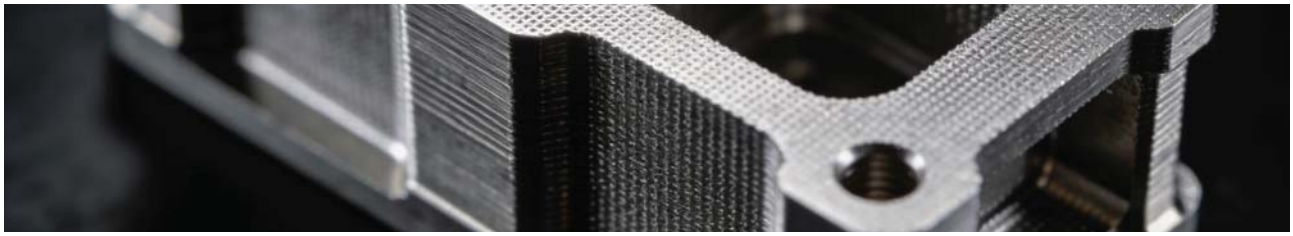
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing 25°C XY	≥ 1015	≥ 784	≥ 24	298	99.97	0.021
Printing 25°C Z	≥ 977	≥ 564	≥ 26	298	99.97	0.021

SEM Micrograph







Iron Based Alloy Powder | Mold Steel Powder CNPC-18Ni300

Material Characteristics

This steel grade offers the highest strength and toughness, featuring high strength, excellent toughness, and good processing performance.

Excellent Strength Properties

Excellent Toughness

Excellent Process Performance

Application Fields

Mold manufacturing, aerospace, medical devices, and other fields.

Composition%

Ni	Mo	Co	Ti	O	Fe
17.5–19.0	4.6–5.2	8.5–9.5	0.6–0.8	≤ 0.1	Bal.

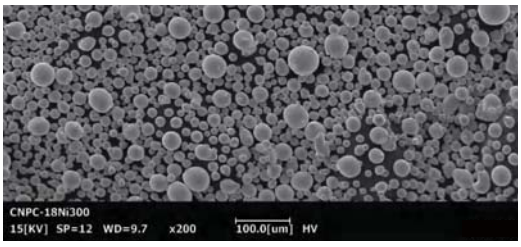
Physical Properties

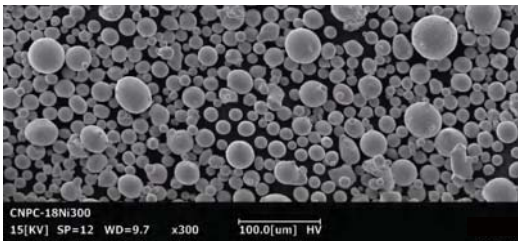
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90	≤ 20	≥ 4.0	≥ 4.0	≥ 80
10–25	25–40	40–60	–	–	–	–

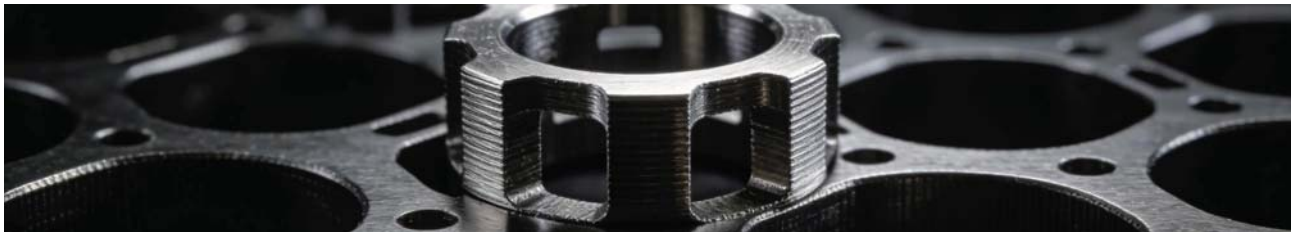
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)
Printing	≥ 1212	≥ 1198	≥ 11	383
Heat Treated 800°C,1h+500°C,1h	≥ 1958	≥ 1695	≥ 5	595

SEM Micrograph







Iron Based Alloy Powder | Mold Steel Powder CNPC-CX

Material Characteristics

Exhibits properties such as corrosion resistance, high strength and hardness, wear resistance, good toughness, and excellent formability.

Superior Corrosion Resistance

Excellent Strength Properties

Excellent Toughness

Application Fields

Mold manufacturing, automotive manufacturing, chemical equipment, and other fields.

Composition%

Cr	Ni	Mo	Al	O	Fe
11.0–13.0	8.4–10.0	1.1–1.7	1.2–2.0	≤ 0.1	Bal.

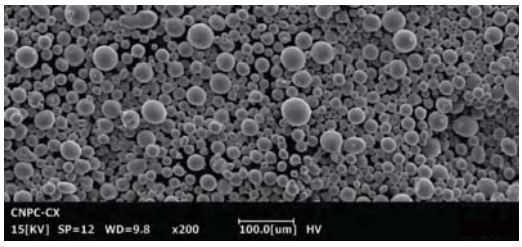
Physical Properties

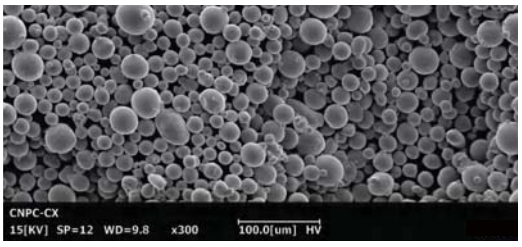
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
≤ 20	≤ 20	≤ 20	≤ 20	≥ 3.5	≥ 4.0	≥ 80
10–25	25–40	40–60	–	–	–	–

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 986	≥ 855	≥ 10	339	99.88	0.12
Heat Treated 530°C,10h	≥ 1351	≥ 1280	≥ 8	470	99.88	0.12
Heat Treated 480°C,10h	≥ 1582	≥ 1545	≥ 5	502	99.88	0.12

SEM Micrograph





Superalloy Powder (Ni-Based) | Superalloy Ni Alloy Powder CNPC-Inconel 718

Material Characteristics

Excellent overall performance, with outstanding strength at high temperatures and good corrosion resistance.

Excellent Comprehensive Properties

Excellent Strength Properties

Superior Corrosion Resistance

Application Fields

Used in the aerospace and industrial manufacturing fields for the production of various turbine and engine components, particularly in the hottest sections.

Composition%

Ni	Cr	Mo	Nb	O	Fe
50.0–55.0	17.0–21.0	2.8–3.3	4.75–5.5	≤ 0.1	Bal.

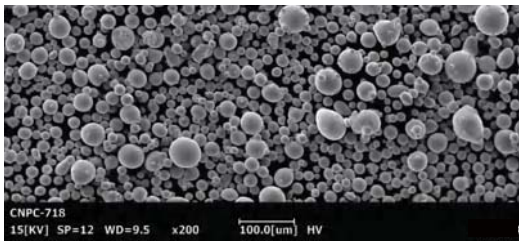
Physical Properties

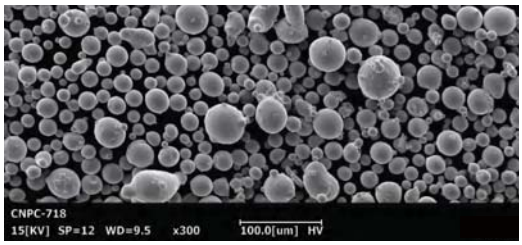
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm^3)	T.D. (g/cm^3)	Sphericity (%)
D10	D50	D90				
10–25	25–40	40–60	—	—	—	—

Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 1049	≥ 829	≥ 27	286	99.82	0.18
Heat Treated	≥ 1458	≥ 1307	≥ 17	530	99.82	0.18

SEM Micrograph





Superalloy Powder (Ni-Based) | Superalloy Ni Alloy Powder CNPC-Inconel 625

Material Characteristics

Exhibits high strength and toughness along with exceptional corrosion resistance in both oxidizing and reducing environments.

Excellent Toughness

Superior Corrosion Resistance

Application Fields

Widely used in aerospace, chemical processing, petroleum, and petrochemical industries.

Composition%

Cr	Mo	Nb	O	Ni
20.0–23.0	8.0–10.0	3.15–4.15	≤ 0.1	Bal.

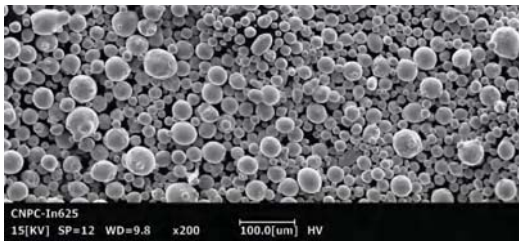
Physical Properties

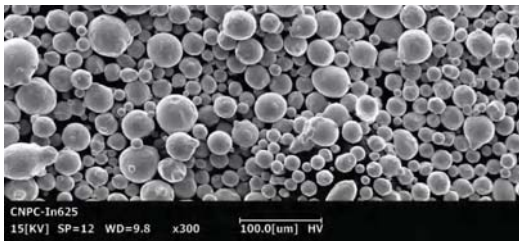
15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)	Sphericity (%)
D10	D50	D90				
≤ 20	≥ 3.5	≥ 4.0	≥ 80			
10–25	25–40	40–60	—	—	—	—

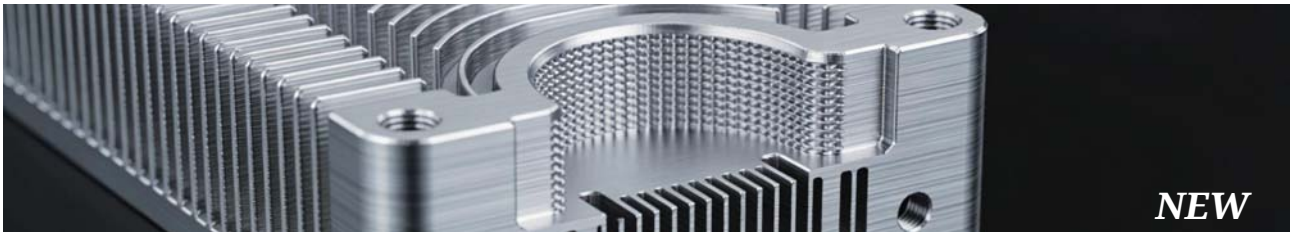
Mechanical Properties

Status	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV1)	Relative Density (%)	Porosity (%)
Printing	≥ 1027	≥ 731	≥ 34	293	99.95	0.05
Heat Treated 1100°C,1.5h	≥ 881	≥ 417	≥ 48	278	99.95	0.05

SEM Micrograph







High-End Precious Metal Powder | CNPC-Silver Powder

Material Characteristics

Silver powder is renowned for its exceptional electrical conductivity (with a conductivity of up to 6.3×10^7 S/m, the highest among metals), making it an ideal material for high-frequency and high-precision electronic devices. Its low-temperature processing characteristics prevent damage to substrates caused by high temperatures, offering unique advantages in cold spraying and binder jetting processes. In the field of additive manufacturing, silver powder demonstrates significant potential and is widely used in high-end applications such as electronics, new energy, and medical devices.

Excellent Electrical Conductivity

Low Temperature Machinability

Powder Properties

High purity (Ag ≥ 99.99%)

High sphericity (≥ 92%)

High bulk and tap density

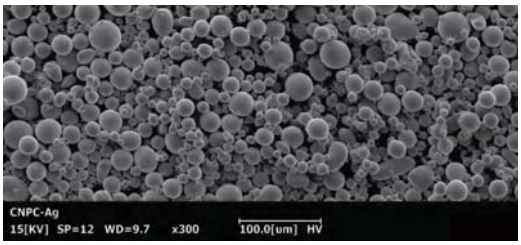
Minimal satellite particles and hollow powder

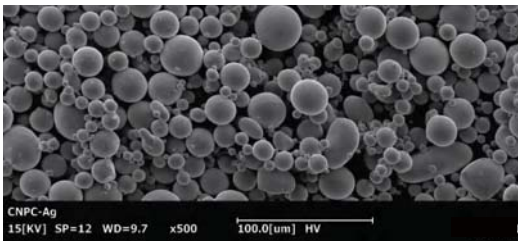
Particle size range: 0–30μm, 15–45μm, 45–150μm, etc.

Typical Additive Manufacturing Processes and Applications

Process	Silver Powder Particle Size(μm)	Technical Advantages	Application Fields
Selective Laser Melting	15–45	High density with forming precision of ± 50μm	High–frequency devices, thermal conductive structures, and artistic crafts
Cold Spraying	0–25	Low–temperature deposition preserves substrate properties, suitable for coating repair and bonding of dissimilar materials	Conductive coatings, battery electrode repair
Binder Jetting	0–25	No need for support structures, enabling the construction of porous functional structures	Lightweight heat sinks, catalyst carriers

SEM Micrograph





High Precision · Jewelry-Grade 3D Printing Silver Powder | CNPC-925 Silver Alloy Powder

Material Characteristics

Pure 925 Silver: 92.5% silver + 7.5% copper alloy reinforcement, strong oxidation resistance, long-lasting luster.
Ultra-fine particle size: 15–53μm, suitable for processes such as DLP, SLM and EBM, with a smooth forming surface.
High Fluidity: Hall Flow Rate ≤ 35s/50g, with a printing layer thickness accuracy of ± 5μm.

High Antioxidant Property

Long-Lasting Luster

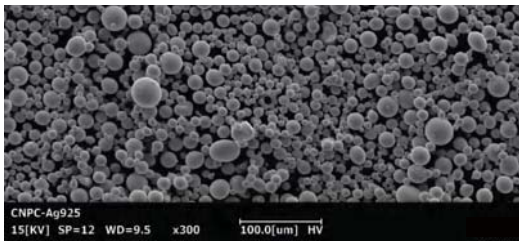
Application Scenarios

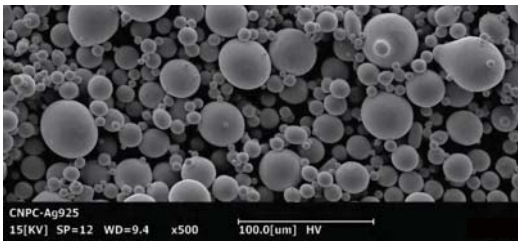
Jewelry and fashion accessory manufacturing, electronics and conductive materials, medical and antibacterial fields, industrial catalysis and chemical industry.

Physical Properties

15–53 μm Laser Particle Size Distribution of Powder (μm)			Hall Flow Rate (S/50g)	A.D. (g/cm³)	T.D. (g/cm³)
D10	D50	D90	≤ 35	4.8–5.2	5.5–6.5
15–20	25–40	40–60	–	–	–

SEM Micrograph





Lightweight and High-Strength Alloy Powder

Aluminum-Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 20–63μm	Yield Strength (MPa) Heat Treated	Elongation (%)	Particle Size Range (μm)
Scalmalloy®	Sc, Mg, Zr, Mn, O, Al Bal.	0.05	1.1	1.3	90	≥ 539	≥ 509	≥ 8	15-53 20-63 20-70
CNPC-AlSi10Mg	Si, Mg, Al Bal.					≥ 340	≥ 250	≥ 10	
CNPC-AlSi7Mg	Si, Mg, Al Bal.					≥ 300	≥ 190	≥ 8	
CNPC-AlMgMnZr	Fe, Mg, Zr, Mn, O, Al Bal.					≥ 461	≥ 430	≥ 13	
CNPC-Al5052	Mg, Si, Mn, Fe, Al Bal.					≥ 360	≥ 200	≥ 12	
CNPC-AlCeScZr	Ce, Sc, Zr, Al Bal.					≥ 534	≥ 493	≥ 9	
CNPC-AlCeCaMn	Ce, Ca, Mn, Al Bal.					≥ 300	≥ 200	≥ 15	
CNPC-Al6061Zr	Mg, Si, Fe, Cr, Zr, Zn, Al Bal.					≥ 345	≥ 306	≥ 20	
CNPC-AlSi9Cu3	Si, Mg, Cu, Al Bal.					≥ 320	≥ 210	≥ 8	
CNPC-AlFeScZr	Fe, Sc, Zr, Al Bal.					≥ 520	≥ 210	≥ 10	
CNPC-AlCeZr	Ce, Zr, Al Bal.					≥ 500	≥ 465	≥ 6	
CNPC-AlCuMgZr	Cu, Mg, Zr, Fe, Al Bal.					≥ 400	≥ 210	≥ 5	
CNPC-AlCuNiTiSc	Cu, Ni, Ti, Sc, Al Bal.					—	—	—	
CNPC-Al0407	Ce, Ni, Al Bal.					≥ 227	≥ 184	≥ 9.5	
CNPC-AlSi40	Si, Fe, Ni, Cu, Al Bal.					≥ 321	≥ 310	≥ 1.5	

Ti-Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 20–63μm	Yield Strength (MPa) Heat Treated	Elongation (%)	Particle Size Range (μm)
CNPC-Ti6Al4V	Al, V, Fe, O, Ti Bal.	0.08-0.13	2.3	2.6	45	≥ 1022	≥ 905	≥ 10	0-25 15-45 15-53 50-150
CNPC-TA15	Al, V, Mo, Zr, Ti Bal.					≥ 1050	≥ 1000	≥ 10	
CNPC-Ti64X	Al, V, Fe, N, Ti Bal.					≥ 1270	≥ 1200	≥ 11.5	
CNPC-CPTi	Ti.					—	—	—	
CNPC-TB8	Al, Fe, Mo, Nb, O, Ti Bal.					≥ 1577	≥ 1530	≥ 3.5	

Flame-Retardant Mg-Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 30–90μm	Yield Strength (MPa) Heat Treated	Elongation (%)	Particle Size Range (μm)
CNPC-AZX912	Al, Zn, Mn, Cu, Mg Bal.	0.2	0.9	1.1	—	—	—	—	30–90

The mechanical performance parameters in this brochure are for selection reference only.
Actual performance shall be subject to on-site application test results.

Product List

Copper Alloy Powder

Copper Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 15–53μm Heat Treated	Yield Strength (MPa) 15–53μm Heat Treated	Elongation (%) 15–53μm Heat Treated	Particle Size Range (μm)
CNPC-GCu	Cu	0.1	4.0	5.2	22	≥ 400	≥ 340	≥ 22	0-25 15-53 50-150
CNPC-GCuSn10	Sn, Cu Bal.					—	—	—	
CNPC- CuCrZr	Cr, Zr, Fe, Si, O, Cu Bal.					≥ 541	≥ 447	≥ 16	
CNPC-CuCrNb (GrCop42)	Cr, Nb, Cu Bal.					≥ 350	≥ 180	≥ 30	
CNPC-CuAlNiFe	Fe, Ni, Al, Cu Bal.					—	—	—	
CNPC-CuSn12Ni2	Sn, Ni, Cu Bal.					—	—	—	
CNPC-CuNiCrSi	Ni, Cr, Si, Cu Bal.					—	—	—	

Ferroalloy Powder

Fe-Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 15–53μm Heat Treated	Yield Strength (MPa) 15–53μm Heat Treated	Elongation (%) 15–53μm Heat Treated	Particle Size Range (μm)
CNPC-SS304L	Cr, Ni, C, Fe Bal.	0.1	3.5	4.6	20	≥ 650	≥ 400	≥ 49	0-25 15-53 50-150
CNPC-SS316L	Cr, Ni, C, Mo, O, Fe Bal.					≥ 745	≥ 336	≥ 28	
CNPC-SS17-4PH	Cr, Ni, Cu, Nb, O, Fe Bal.					≥ 977	≥ 564	≥ 26	
CNPC-SS15-5PH	Cr, Ni, Nb, Cu, Fe Bal.					≥ 1450	≥ 1100	≥ 14	
CNPC-18Ni300	Ni, Mo, Co, Ti, O, Fe Bal.					≥ 1958	≥ 1695	≥ 5	
CNPC-18Ni350	Mo, Co, Cr, Ti, Mn, Ni, Fe Bal.					≥ 2286	≥ 2207	≥ 4	
CNPC-H13	Cr, Mo, V, Si, Fe Bal.					—	—	—	
CNPC-D2	C, Cr, Mo, V, Fe Bal.					—	—	—	
CNPC-M2	Cr, Mo, W, V, Fe Bal.					—	—	—	
CNPC-CX	Cr, Ni, Mo, Al, O, Fe Bal.					≥ 1582	≥ 1545	≥ 5	

High-Temperature Alloy Powder

Ni–Based Alloy	Composition (%)	Oxygen (%)	A.D. (g/cm³)	T.D. (g/cm³)	Fluidity (s/50g)	Tensile Strength (MPa) 15–53μm Heat Treated	Yield Strength (MPa) 15–53μm Heat Treated	Elongation (%) 15–53μm Heat Treated	Particle Size Range (μm)
CNPC–Inconel718	Ni, Cr, Mo, Nb, O, Fe Bal.	0.05	3.5	4.0	20	≥ 1458	≥ 1307	≥ 17	15–53
CNPC–Inconel625	Cr, Mo, Nb, O, Ni Bal.					≥ 881	≥ 417	≥ 48	

Other Alloy

Precious Metal	Composition (%)	Oxygen (%)	A.D. (g/cm³)	Particle Size Range (μm)
CNPC–Ag	Ag	0.05	4.0–4.5	0-30、15-45、45-150
CNPC–Ag925	Ag, Cu	0.01–0.08	4.0–4.5	
Refractory Metal	**Composition (%)**	**Oxygen (%)**	**A.D. (g/cm³)**	**Particle Size Range (μm)**
CNPC–Nb C103	Hf, Ti, Nb	0.05	4.0–4.5	0-30、15-45、45-150
CNPC–Nb 521	W, Mo, Zr, Nb	0.01–0.08	4.0–4.5	
High–Entropy Alloy Powder	**Composition (%)**	**Oxygen (%)**	**A.D. (g/cm³)**	**Particle Size Range (μm)**
CNPC-AlCeTiFeNiCo	Ce, Ti, Fe, Ni, Co, Al Bal.	0.15	1.40	0-30、15-45、45-150

Production Technology

Production Process Steps

Strategic Partner of APWORKS GmbH

- Exclusive authorized manufacturer and distributor in China for Scalmalloy® high-strength aluminum alloy from APWORKS, a subsidiary of Airbus Group.

Recyclable Technology Empowering Low-Carbon ESG Development

- Innovative scrap recycling-based powder production process
- SCS-certified 100% green recyclable raw materials

Production Technology

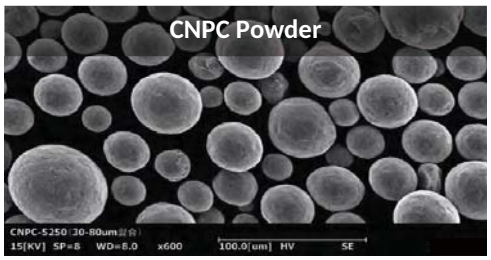
Self-developed AMP Production Line (Novel Gas Atomization Process)

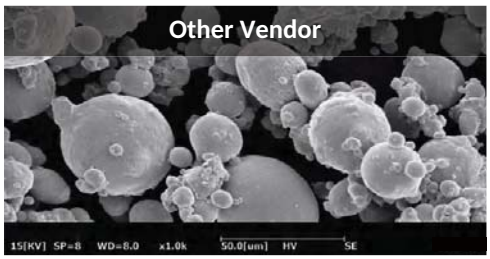
- Higher yield for LPBF powder
- High sphericity and good flowability
- Few satellites and hollow particles
- High output and competitive cost

Prepare for large-scale industrial applications

Comparison Chart of AMP Line with Other Technologies

Technology Comparison	Applicable Material	Material Form	Sphericity Fluidity	Satellite Powder	Impurity	Capacity Output
Automated Metal Production (AMP)	Al, Cu, Fe, Ni Alloys	Bar, Ingot, Block	Excellent	Less	Less	Larger
Vacuum Induction Melting Gas Atomization (VIGA)	Ni, Al, Cu, Fe, Co Alloys	Bar, Ingot	Average	A few	A few	Larger
Plasma Spheroidization (PS)	Ti, Ni, Nb, W, Mo, Ta Alloys	Powder	Good	Less	Less	Small
Plasma Rotating Electrode Process (PREP)	Ti, Ni, Nd, Fe, Cu Alloys	Bar	Excellent	None	None	Small
Electrode Induction Melting Gas Atomization (EIGA)	Ti, Ni Alloys	Bar	Excellent	Less	Less	Larger





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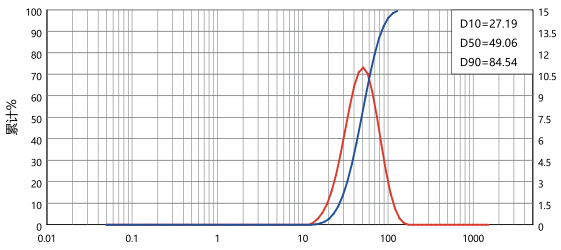
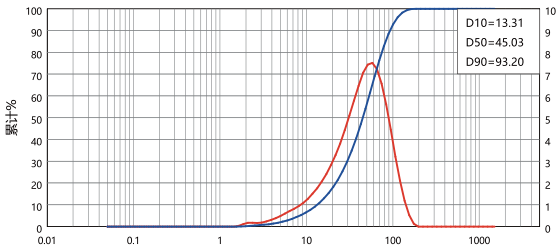
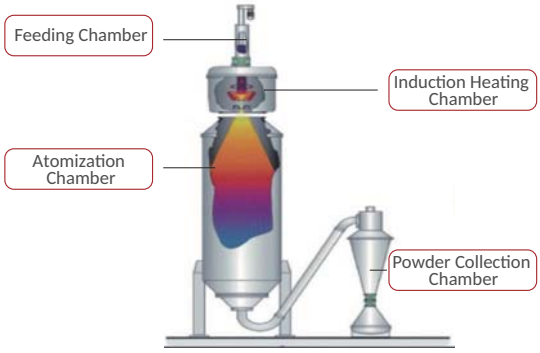




Production Technology

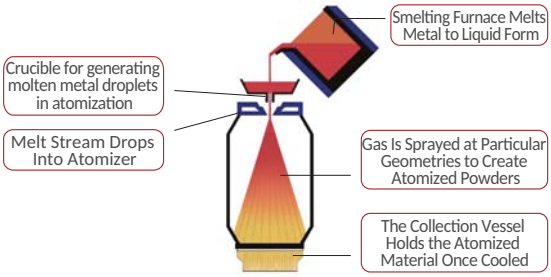
Electrode Induction Melting Gas Atomization (EIGA)

- Crucible-free, zero pollution
- High sphericity
- Rapid cooling with uniform microstructure
- Specially for high-activity metals



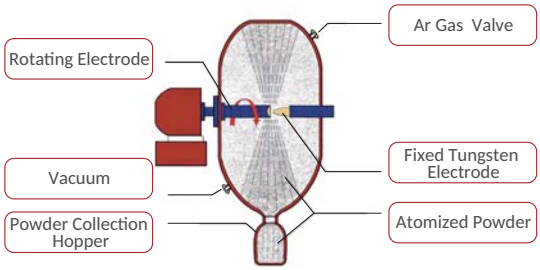
Vacuum Induction Melting Gas Atomization (VIGA)

- High sphericity
- Controllable oxygen levels
- Suitable for high-efficiency mass production



Plasma Rotating Electrode Process (PREP)

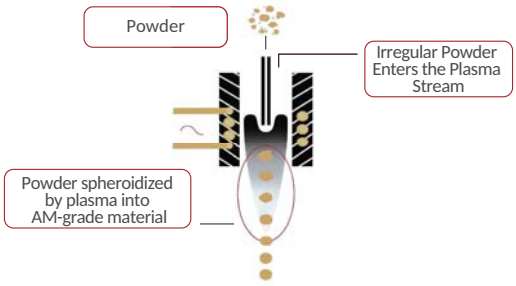
- High purity, low oxygen, low impurities
- Perfectly spherical and satellite-free
- Narrow particle size distribution
- High flowability and high apparent density

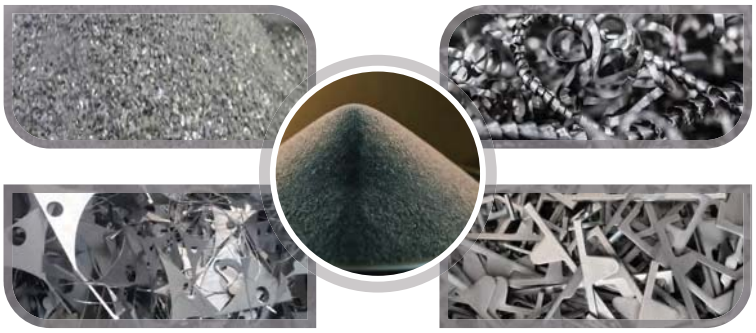


Production Technology

Plasma Spheroidization (PS)

- High flowability and high apparent density
- Perfectly spherical and essentially satellite-free
- Narrow particle size distribution

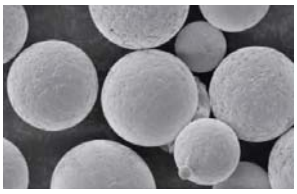




Before Plasma Spheroidization

VS

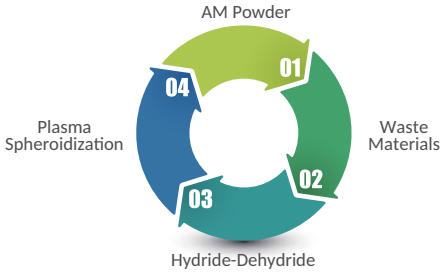
After Plasma Spheroidization



Spec.Optimization	Before	After
Sphericity Value (Ψ)	0-90	90-97
Oxygen Content	0.2-0.4%	0.1-0.2%
Flowability Improvement	≥ 20%	
Material Utilization Rate	95-100%	

Recycling Materials-Titanium Alloy Powder

- Closed-loop recycling process with a waste powder utilization rate of over 95%
- Stable performance, with quality comparable to virgin powder
- Carbon emissions are only 10% of traditional EIGA processes
- Cost-optimized, suitable for large-scale industrial production



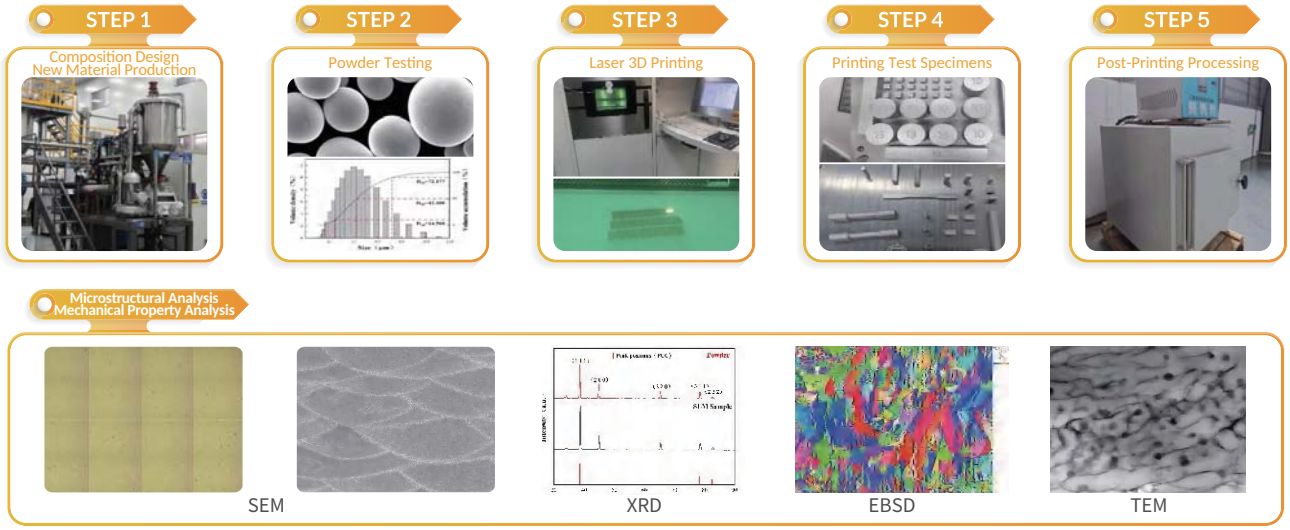
New Material R&D & Print Testing

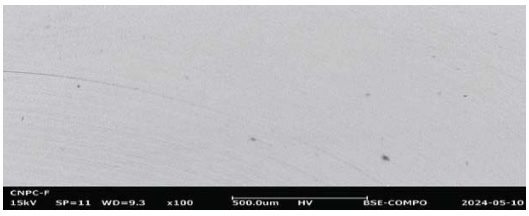
R&D Advantages

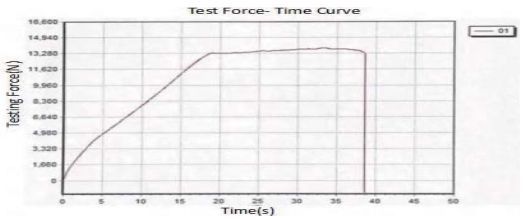
R&D

- A highly qualified · top-tier team
  of academic experts and process engineers with extensive experience
- Efficient and commited R&D
  Alloy production cycle < 1 week (3–6 weeks for traditional processes)
  Performance report < 2 weeks (full dimensional analysis of composition-structure-mechanics)
- AI model-driven: composition design efficiency improved by 70%
- Deep collaboration · customization
  Co-creation + scenario-oriented + continuous iteration
- Efficiency, effectiveness, and flexibility
- Experience and key resources

Metal 3D Printing Material Development







Quality Management

Raw Material Quality Control

- Supplier management
- Raw material inspection

Process Flow

- Implementation of process control
- Identity traceability management

Rigorous Testing Capabilities

- Chemical analysis
- Mechanical properties
- Printing performance

MES Digital and Automation System

- Visual management of full production process
- Full-link material traceability
- Equipment predictive maintenance
- Full process quality control
- Data-driven decision analysis
- Seamless cross-system integration


ICP Spectrometer


Malvern Particle Size Analyzer


Oxygen & Nitrogen Analyzer

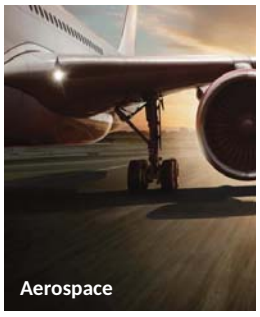

Carbon Sulfur Analyzer


Specific Surface Area Analyzer

COXEM Scanning Electron Microscope


Fluidity Tester | Laser Particle Size Analyzer | Tap Density Tester

Application Fields



Honors and Patents



Honors and Certifications

- National High-Tech Enterprise
- Low-Carbon Footprint Recognition
- Municipal Green Factory Certificate
- Energy Management System Certification
- Certificate of Quality Management System
- IATF 16949 Alloy Powder Production Certification
- Certificate of Environmental Management System
- SCS Recyclable Certification for Al & Ti Alloy Powders
- Certificate of Occupational Health and Safety Management System
- National Military Standard (GJB 9001C) Quality Management System Certification