

SPHERICAL METAL POWDER

BASE	MATERIAL CLASS	NAME	ALT. NAME	MATERIAL PROPERTIES
Cu	Copper Alloys	MET CuCr1Zr	C18150	MET CuCr1Zr is a hardenable copper alloy, which combines high strength and hardness with a very low thermal resistance. It has good thermal and electrical conductivity.
		MET CuNi2SiCr	C18000	MET CuNi2SiCr has got even higher strength and hardness than CuCr1Zr at a slightly lower thermal and electrical conductivity.
		MET CuNi10	C70700	MET CuNi10 is a very resilient material with extremely good seawater resistance.
		MET Cu-OF	C10200	High purity oxygen-free copper – highest thermal and electrical conductivity (>99,95% Cu).
Fe	Stainless and Wear Resistant Steels	MET 304L	1.4306	Austenitic chromium-nickel steel with a low carbon content (<0,030%); better corrosion resistance than 1.4301 or 1.4307 due to higher chromium and nickel content.
		MET 316L	1.4404	Austenitic chromium-nickel-molybdenum steel with a low carbon content (<0,030%); good resistance to chloric media and non-oxidizing acids
		MET 316L Med	1.4435	Austenitic chromium-nickel-molybdenum steel with a low carbon content (<0,030%); good resistance to chloric media and non-oxidizing acids
		MET 17-4PH	1.4542	Martensitic chromium-nickel-copper stainless steel stabilized with Niobium. High strength and hardness due to precipitation hardening.
		MET 1.2343	H11/T20811	High-alloy hot-work steel with high toughness and heat resistance, hot cracks resistance and good thermal conductivity.
Ni	Nickel	MET IN625	2.4856	2.4856 is a low carbon nickel-chromium-molybdenum-niobium alloy. Service temperatures from cryogenic to 982°C; outstanding corrosion resistance.
		MET IN718	2.4668	2.4668 is a nickel-chromium-iron alloy with niobium, molybdenum, aluminum, and titanium; outstanding mechanical properties and corrosion resistance.
		MET Alloy K500	2.4375	2.4375 is a nickel-copper alloy with a very high strength and hardness. Due to its excellent corrosion resistance, it is used in the field of marine technology and chemistry.
Ti	Titanium Alloys	MET Ti99,9	Ti Grade 1	Unalloyed Titanium with very low oxygen content; good corrosion resistance and biocompatibility.
		MET Ti99,9	Ti Grade 2	Unalloyed Titanium with low oxygen content; good corrosion resistance and biocompatibility.
		MET Ti6Al4V	Ti Grade 5	Titanium-aluminum-vanadium alloy; best combination of strength, toughness, and ductility; age-hardenable alloy, good biocompatibility
		MET Ti6Al4V-ELI	Ti Grade 23	“ELI” stands for “extra low interstitials” - lower oxygen and nitrogen content than Grade 5, used for medical and aerospace applications
Mo	Molybdenum	MET Mo99,9%	Mo99	High melting temperature (2623°C), low thermal expansion coefficient, operational temperature up to 1900°C
Other materials on request				

METALS FOR ADDITIVE MANUFACTURING

Any metal or alloy can be atomized with our proprietary process, according to your needs. All products can be made in narrow particle size distributions, e.g.

- <5µm
- 5-20µm
- 15-45µm
- 20- 63µm
- others on request

COMMISSION PROCESSING

Metalpine GmbH is your service partner concerning all of below listed processes.

Powder production

We developed a **unique powder production process** to provide perfect spherical powders (patent pending). Any metal or alloy can be atomized according to your needs. Our processes are run with Argon as atomization gas in a dust-free production environment to guarantee maximum product quality. Any process (production, classifying, screening, packaging) can be done under Argon 5.0, so oxygen-free production can be guaranteed.

Back-up Powder production plant

A back-up powder manufacturing location is available at our sister company HTM in Niklasdorf, 75km from Graz.

Powder screening

With various screening technologies we can screen your powder at grain sizes from 10 to 1000 microns.

Powder classifying

With our state-of-the-art classifiers we can provide narrow particle size distributions, produce ultrafine powders (d99<5 microns) or remove dust from your powders.

Packaging

We pack the powders according to your needs and manage transport organization.

Laboratory Services

In our in-house laboratory, we measure particle size distributions with laser light scattering (Horiba LA-960 according to ISO 13320) and digital image processing (Camsizer X2 according to ISO 13322-2). Flowability is measured by Hall Flow Meter (ISO 4490, ASTM B213). For more sophisticated flowability problems, Schulze Ring Shear tests can be conducted by our university partners.

Send us your request!

COPPER ALLOY: METALPINE CuCr1Zr

Alternative designation: C18150 or CW106C

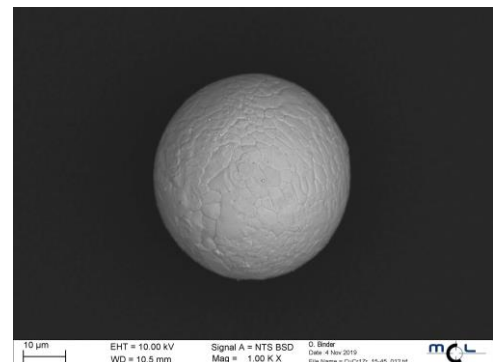
Description and material properties

MET CuCr1Zr is a hardenable copper alloy, which combines high strength and hardness with a very good thermal resistance. It has good thermal and electrical conductivity. Furthermore, it is characterized by a good wear resistance.

It is used for machinery construction and electrical applications, mold cooling inserts, high performance applications in the aerospace or automotive industry.

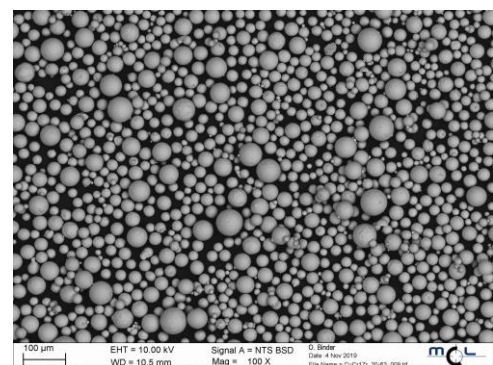
Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	0,5	1,2
Zr	0,03	0,3
Fe		0,08
Si		0,1
Other		0,2
Cu	Balance	Balance



Physical Properties		
Properties	Min	Max
Flow Rate [s/50g]		15
Bulk Density [g/cm ³]	4,9	

Example Value for PSD 20 – 63µm



COPPER ALLOY: METALPINE CuNi2SiCr

Alternative designation: C18000 or CW111C

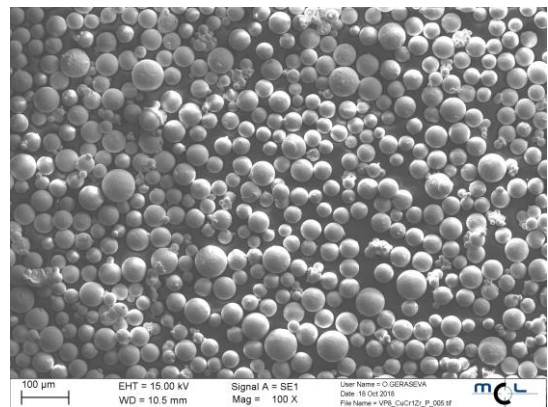
Description and material properties

MET CuNi2SiCr is a thermally curable low-alloyed copper material with high stiffness, also at elevated temperatures. It has good thermal and electrical conductivity. This material has high corrosion resistance and fits well for wear and sliding applications.

MET CuNi2SiCr is used for tooling, as mold insert and for highly thermally stressed construction elements. This copper alloy is also free of beryllium.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Ni	2,0	3,0
Si	0,5	0,8
Cr	0,2	0,5
Fe		0,15
Mn		0,1
Pb		0,02
Other		0,1
Cu	Balance	Balance



Physical Properties		
Properties	Min	Max
Flow Rate [s/50g]		15
Bulk Density [g/cm ³]	4,9	

Example Value for PSD 20 – 63µm

COOPER ALLOY: METALPINE CuNi10

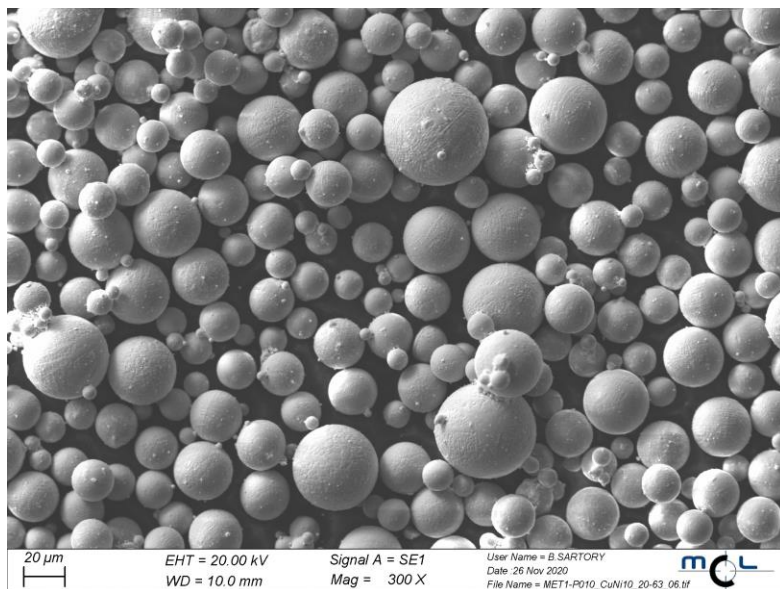
Alternative designation: C70700

Description and material properties

MET CuNi10 is an extremely resistant material with a very high seawater corrosion resistance. Typical applications are shipbuilding, oil refining machinery, food processing industries and so on.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Ni	9,5	10,5
Fe		0,05
Mn		0,50
Cu	balance	Balance



COPPER ALLOY: METALPINE Cu-OF

Alternative designation: C10200 or CW008A

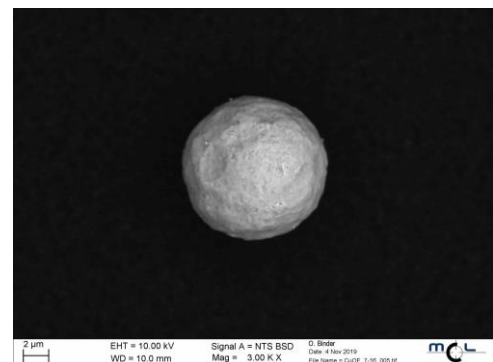
Description and material properties

MET Cu-OF is an extreme pure, oxygen free Copper with minimum 99,95% Cu. It combines the advantages from Cu-ETP and the phosphor deoxidized Copper materials. The high pureness of the material combined with missing oxygen inclusions allows a 100% IACS electrical conductivity and is not affected from hydrogen embrittlement. MET Cu-OF has a good deformability, solder- and weldability, better than Cu-ETP.

Typical applications are electrical and electronic components and the communication industry.

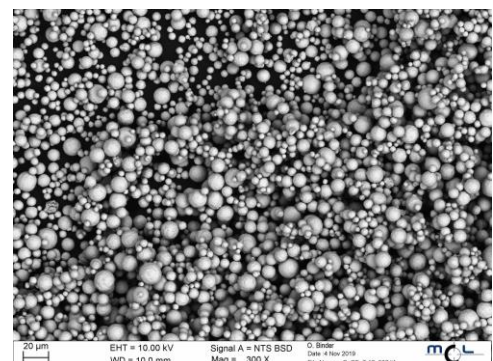
Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Pb		0,005
O		0,05*
Bi		0,0005
Cu	99,95	Balance



Physical Properties		
Properties	Min	Max
Flow Rate [s/50g]		20
Bulk Density [g/cm³]	4,5	

Example Value for PSD 15 – 45µm



STAINLESS STEEL: METALPINE 304L

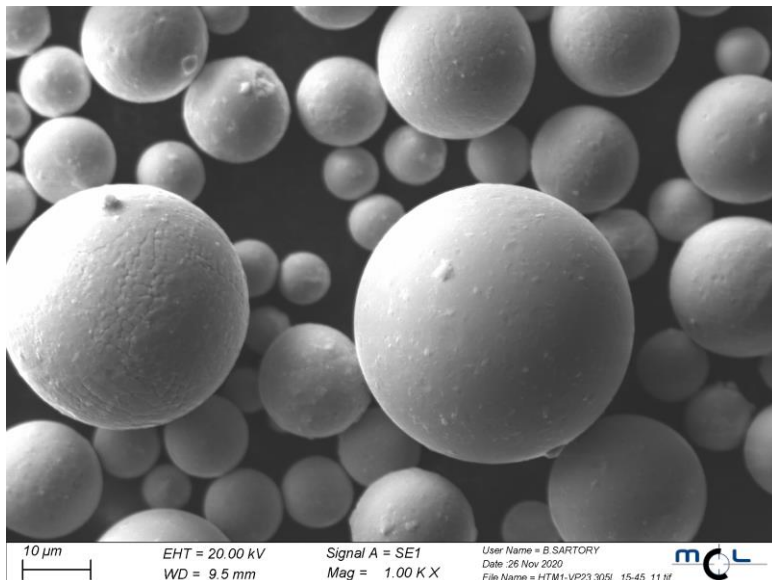
Alternative designation: 1.4306

Description and material properties

MET 304L is a stainless steel with a low carbon content and good corrosion resistance. This steel is used mainly in the chemical and pharmaceutical industry. A high gloss surface finish can be achieved.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	18,0	20,0
Ni	10,0	11,0
C		0,03
Other		3,075
Fe	Balance	Balance



STAINLESS STEEL: METALPINE 316L

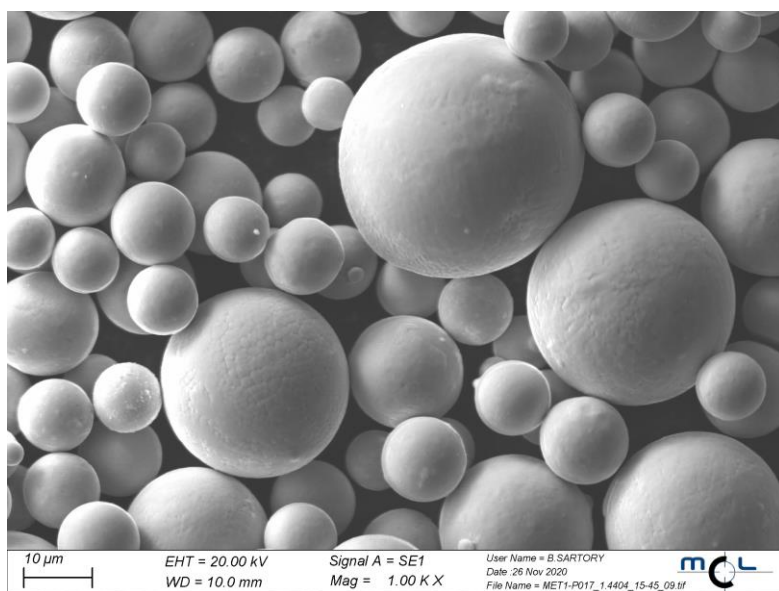
Alternative designation: 1.4404

Description and material properties

MET 316L is a stainless steel with a low carbon content and good corrosion resistance. It is commonly used in chemical and petrochemical industry, in food processing, pharmaceutical equipment, medical devices, in potable water, wastewater treatment, in marine applications and architectural applications near the seashore or in urban areas.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	16,5	18,0
Ni	10,0	13,0
Mo	2,0	2,5
C		0,03
P		0,045
S		0,015
N		0,1
Fe	Balance	Balance



STAINLESS STEEL: METALPINE 316L MEDICAL

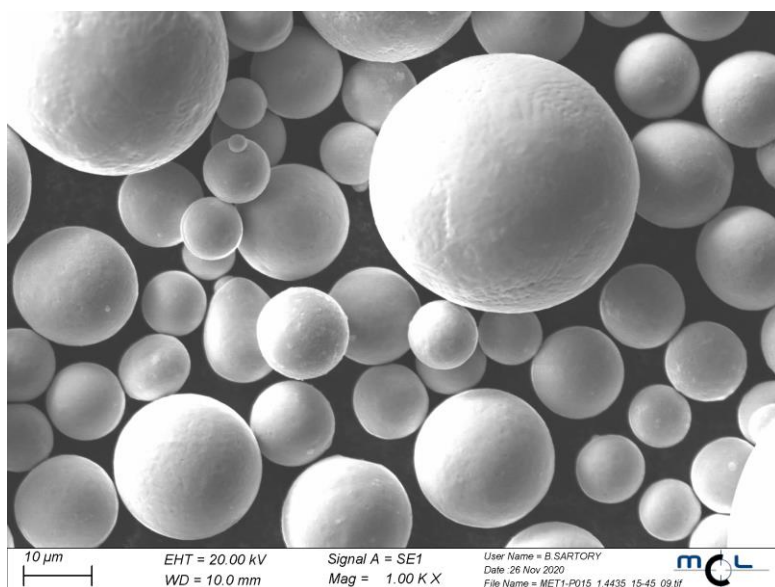
Alternative designation: 1.4435

Description and material properties

MET 316L Medical is a stainless steel with a very low carbon content and high corrosion resistance. Due to its resistance to many forms of corrosion and the excellent surface quality that can be achieved, it is mainly used in medical technology. Furthermore, it is used in chemical and petrochemical industry, in food processing, pharmaceutical equipment, in potable water, wastewater treatment, in marine applications and architectural applications near the seashore or in urban areas.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	17,0	18,0
Ni	12,5	14,0
Mo	2,5	3,0
C		0,03
P		0,045
S		0,015
N		0,1
Fe	Balance	Balance



STAINLESS STEEL: METALPINE 17-4PH

Alternative designation: 1.4542

Description and material properties

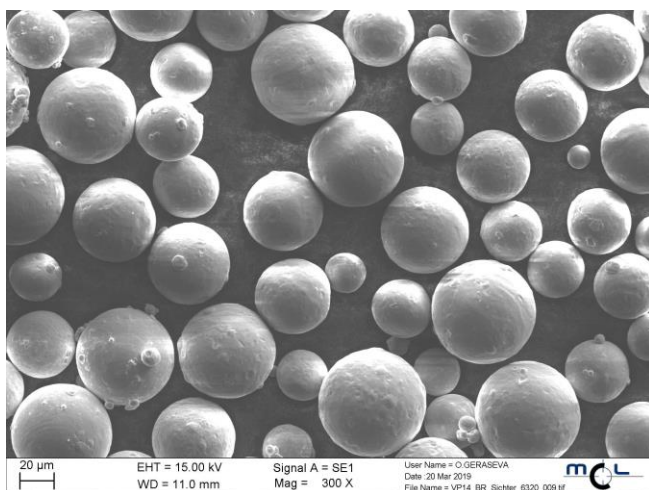
MET 17-4PH is a stainless steel with high yield strength, high wear resistance as well as good corrosion resistance. It is possible to be used in low temperatures and has excellent impact strength even at minus temperatures.

Due to the combination of corrosion resistance and good mechanical properties, this material MET 17-4PH is also suitable for use in maritime environments, whenever the corrosion resistance and mechanical properties of martensitic steels are insufficient. In standing seawater it is vulnerable to corrosion fissures.

MET 17-4PH is used in plant construction, chemical industry, wood industry, offshore, shipbuilding, mechanical engineering, oil industry, paper industry, air and water industry. Space travel, sports and leisure industry.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	15,0	17,0
Ni	3,0	5,0
Cu	3,0	5,0
Nb	5xC	0,45
Other		2,36
Fe	Balance	Balance



WEAR RESISTANT STEEL: METALPINE 1.2343

Alternative designation: H11/T20811

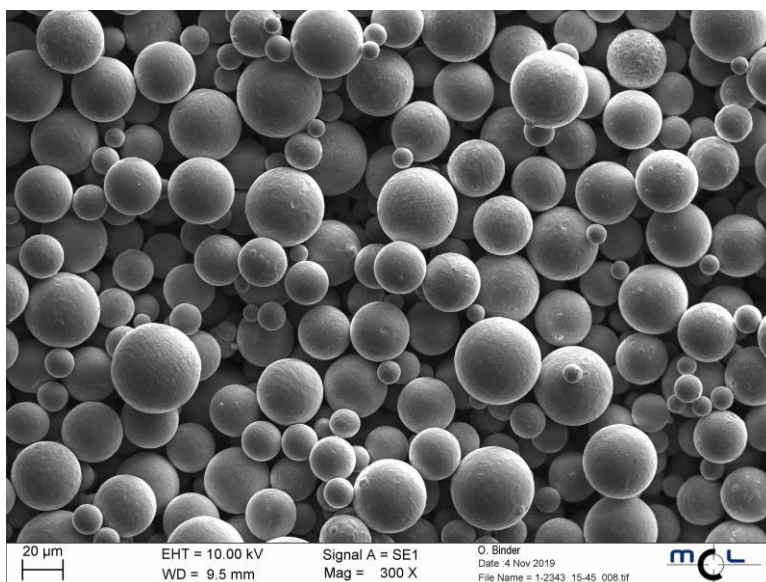
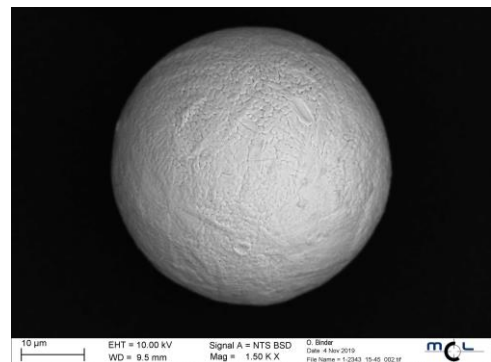
Description and material properties

MET 1.2343 hot work tool steel with high temperature strength and wear resistance with high thermal shock resistance. Plastic molds, die-casting and extrusion tools for light metal. Good toughness and thermal conductivity.

MET 1.2343 is used for forging dies, forging tools, hot shear blades, hot extrusion tools, punches, screw tools, steel pins and ejector.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	4,8	5,5
Mo	1,1	1,5
Si	0,8	1,2
C	0,33	0,41
V	0,3	0,5
Mn	0,25	0,5
Other		0,05
Fe	Balance	Balance



NICKEL BASED: METALPINE IN625

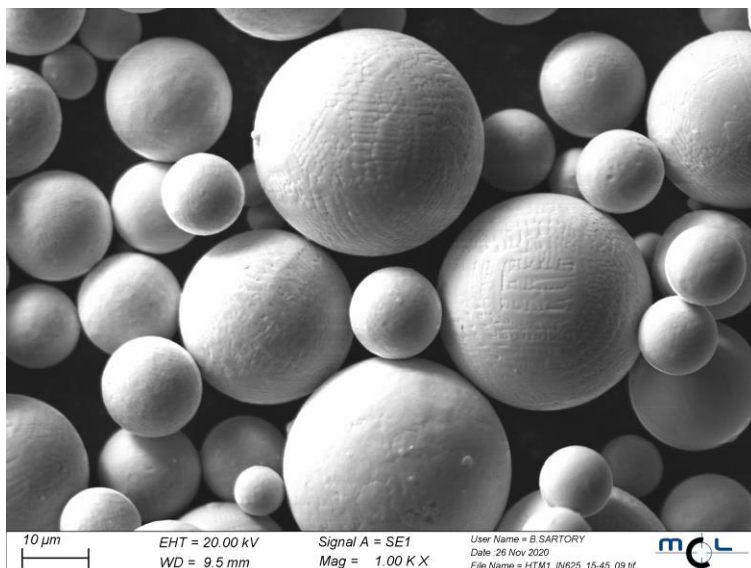
Alternative designation: 2.4856 or N06625

Description and material properties

MET Inconel 625 is a nickel-based superalloy that possesses high strength properties and resistance to elevated temperatures. It also demonstrates remarkable protection against corrosion and oxidation. Its ability to withstand high stress and a wide range of temperatures, both in and out of water, as well as being able to resist corrosion while being exposed to highly acidic environments makes it a fitting choice for nuclear and marine applications. Typical applications are seawater components, flare stacks, aircraft ducting systems, specialized seawater equipment, chemical process equipment, turbine shroud rings, engine thrust-reverser systems, jet engine exhausts systems.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Cr	20,0	23,0
Mo	8,0	10,0
Nb+Ta	3,15	4,15
Fe		5,0
Other		2,95
Ni	Balance	Balance



NICKEL BASED: METALPINE IN718

Alternative designation: 2.4668

Description and material properties

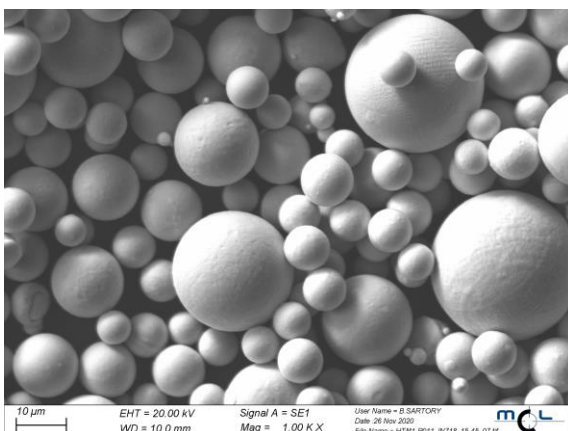
MET Inconel 718 is a high-strength, corrosion-resistant nickel chromium material used in a wide temperature range from cryogenic to high temperature applications.

The age-hardenable alloy can be readily fabricated, even into complex parts. Its welding characteristics, especially its resistance to postweld cracking, are outstanding.

The ease and economy with which MET IN718 can be fabricated, combined with good tensile, fatigue, creep, and rupture strength, have resulted in its use in a wide range of applications. Examples of these are components for liquid fueled rockets, rings, casings and various formed sheet metal parts for aircraft and land-based gas turbine engines, and cryogenic tankage. It is also used for fasteners and instrumentation parts.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Ni	50,0	55,0
Cr	17,0	21,0
Nb	4,75	5,5
Mo	2,8	3,3
Ti	0,65	1,15
Al	0,2	0,8
Other		2,2
Fe	Balance	Balance



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NICKEL BASED: ALLOY K500

Alternative designation: 2.4375 or N05500

Description and material properties

MET Alloy K500 is a nickel-copper alloy which has extreme hardness and high tensile strength in the temperature range lower than 650°C (1.202°F). The melting point of this material is 1.350°C (2.462°F). Due to its excellent corrosion resistance in marine and chemical applications, MET Alloy K500 has applications in springs, shafts and fasteners for marine propellers, oil handling equipment, knives, scrapers and springs.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
C		0,2
Si		0,5
Mn		1,5
S		0,015
Al	2,2	3,5
Cu	27,0	34,0
Fe	0,5	2,0
Ni	63,0	
Ti	0,3	1,0
Co		1,0
H		0,01
N		0,1
O		0,04

TITANIUM ALLOY: METALPINE Ti99,9

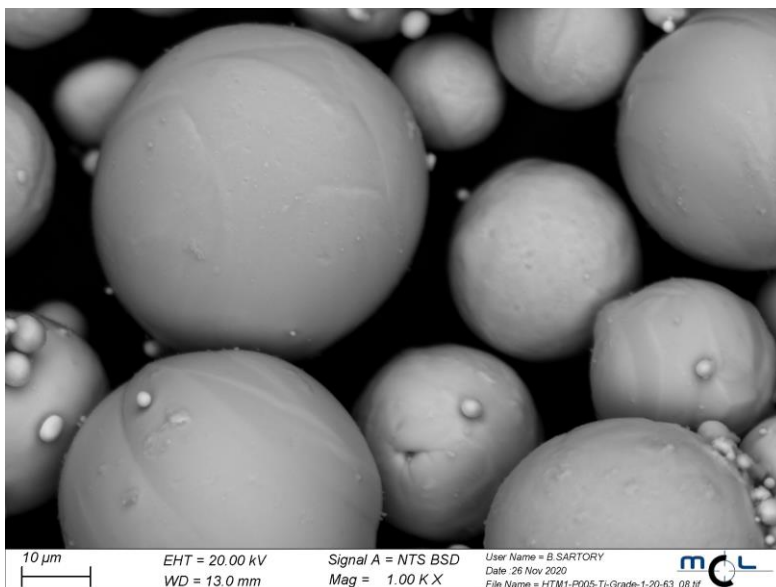
Alternative designation: Ti Grade 1

Description and material properties

MET Ti99,9 is the softest, unalloyed grade of titanium with the lowest strength and highest ductility. It's weldable, cold formability and an impact-resistant alloy. MET Ti99,9 has good resistance to mildly reducing conditions and very good resistance to strong oxidizing environment with or without chlorides. The alloy is used for a variety of applications, including medical industry, marine and automotive industry, airframe structures, plate heat exchangers, chemical equipment, chlorine production, desalination and anodes.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Ti	99,6	Balance
other	Balance	0,4



TITANIUM ALLOY: METALPINE Ti6Al4V

Alternative designation: Ti Grade 5 or Ti64

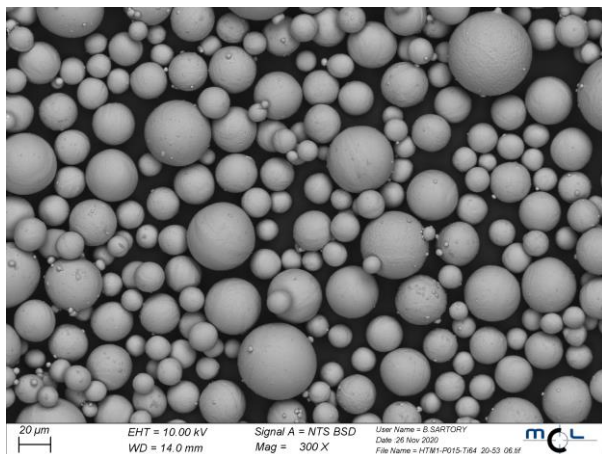
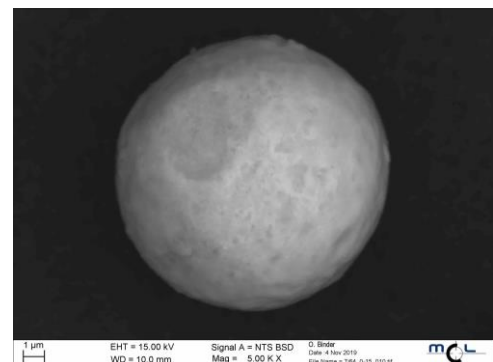
Description and material properties

MET Ti6Al4V, or Grade 5 titanium, is the most commonly used of all titanium alloys. Its usability lies in its many benefits. MET Ti 6Al-4V may be heat treated to increase its strength. It can be used in welded construction at service temperatures of more than 300°C. This alloy offers its high strength at a light weight, useful formability and high corrosion resistance.

MET Ti 6Al-4V is used in many industries such as aerospace, medical, marine and chemical processing industries, for example in aircraft turbines, engine components, aircraft structural components, aerospace fastener, high-performance automatic parts, marine applications, sports equipment's.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Al	5,5	6,75
V	3,5	4,5
Fe		0,4
O		0,2
C		0,08
N		0,05
Ti	Balance	Balance



TITANIUM ALLOY: METALPINE Ti6Al4V-ELI

Alternative designation: Ti Grade 23 or Ti64-ELI

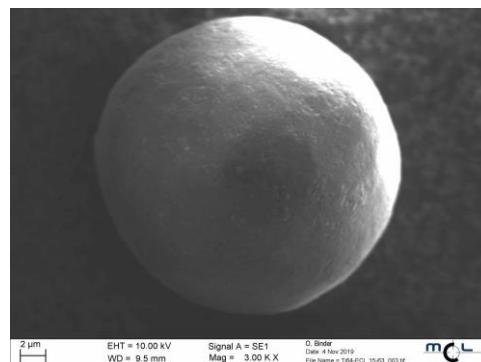
Description and material properties

MET Ti6Al4V-ELI, or Grade 23 titanium, is the higher purity version of MET Ti6Al4V with a very good biocompatibility. It's the top choice for any sort of situation where a combination of high strength, light weight, good corrosion resistance and high toughness are required. It has a superior damage tolerance to other alloys.

These benefits make MET Ti6Al4V-ELI the ultimate dental and medical titanium grade. It can be used in biomedical applications such as implantable components due to its biocompatibility, good fatigue strength and low modulus. It can also be used in detailed surgical procedures.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Al	5,5	6,5
V	3,5	4,5
Fe		0,25
O		0,13
C		0,08
N		0,05
Ti	Balance	Balance



MOLYBDENUM: METALPINE Mo 99,9%

Alternative designation: Mo99

Description and material properties

MET Mo99,9% has one of the highest melting temperatures of all the elements (2.623°C), yet unlike most other high-melting point metals, its density is only 25% greater than iron's. Its coefficient of thermal expansion is the lowest of the engineering materials, while its thermal conductivity exceeds all but a handful of elements. The operating temperature is up to 1.900°C.

Powder characteristics

Chemical Composition [wt.%]		
Element	Min	Max
Mo	99,95	

