



# What perfection is made of

Specialist in powder solutions for additive manufacturing



# AP&C Powders

We know that additive manufacturing is the future. It's a technology that opens up new possibilities in engineering and design capabilities. And we know, in business, precision and quality are key for a successful product. That's why we apply our unique plasma atomization technology, unmatched expertise in additive materials, and unparalleled testing and quality standards to everything we make. We create powders that are highly spherical, with high processability, excellent flowability, and no porosity. That means fewer defects, more efficient processing, and superior quality for our customers.

Because when your products need to be flawless every time, your powders do, too.

**That's what perfection is made of.**

## Superior Features

- Low oxygen content
- High purity
- Excellent flowability
- High apparent and tap densities
- Highly spherical
- Low porosity content
- Batch to batch consistency
- Few to no satellites
- Low internal particle hollows/pores

## Core Expertise

- Plasma atomization technology
- AM alloys
- Reactive metals
- Powder handling

## Superior Services

- Segregated reactors for main products
- Tailored size distributions
- Expert knowledge of AM alloy powders
- Certified quality system  
(AS9100D and ISO 9001:2015 and ISO 13485:2016)
- Complete powder certification
- Traceability from ingot to powder
- Flexible packaging solutions

## End Markets

- Aerospace
- Orthopedics
- Industrial
- Oil & Gas
- Research



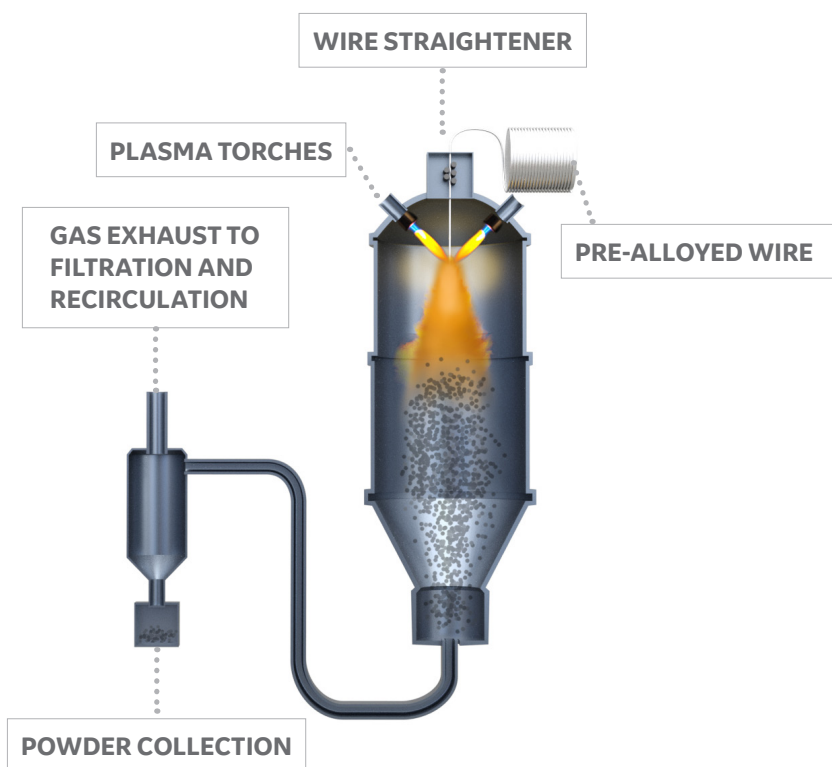


## WHY AP&C POWDERS

We have over a decade of experience working with major orthopedic and aerospace manufacturers. And we're the only company that can supply the highest quality AM powder at a competitive price point.

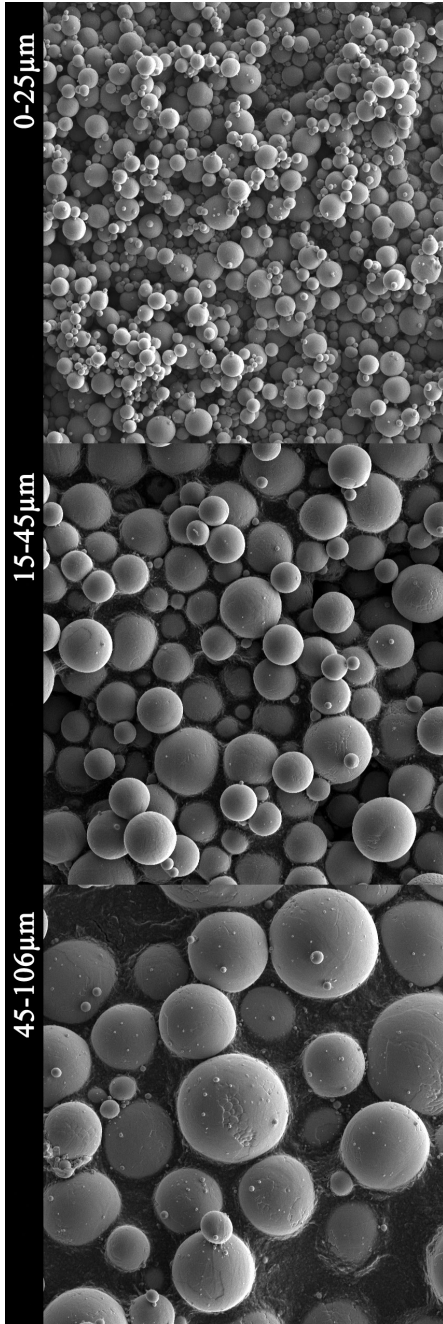
We invest in R&D to optimize the proprietary Advanced Plasma Atomization process to provide superior quality products at competitive process.

In addition, our two state-of-the-art facilities ensure site redundancy and a secured supply chain for customers.



As specialists in spherical metal powder production designed for additive manufacturing, AP&C offers quality powders for all AM processes. In addition, this level of precision is available at competitive prices—allowing for reliable and cost-efficient production.

# The Plasma Atomization Process



Our proprietary Advanced Plasma Atomization (APA™) process uses plasma torches to melt and atomize the metal wire feedstock which is sourced from multiple 100% virgin melted material. In order to prevent contamination and to ensure high purity product, the melting wire never meets any solid surface.

Using a wire feedstock allows an accurate feed rate which provides excellent control over the powder size distribution and batch to batch consistency. The wire chemical composition is maintained for better control of the powder chemistry.

The reactor is purged to a vacuum prior to each production batch then the powder is atomized in a high purity argon atmosphere to ensure the lowest oxygen content.

Then the plasma atomization process superheats the metal. The cooling stage rapidly solidifies the melt into highly spherical powder. And a low concentration of suspended particles is maintained in the reactor chamber to prevent the formation of satellites. Due to the low level of satellite particles, our spherical powders exhibit an excellent flowability rating.

The produced powder size distribution ranges from 0 to 150 µm with the vast majority between 0 to 106 µm or 0 to 75 µm depending on configuration. Powder is sieved to the requirements of each customer and each lot is blended for homogeneity, tested, and certified before packaging.





## Standard Spherical Powder Products

- CpTi grade 1
- CpTi grade 2
- Ti-6Al-4V grade 5
- Ti-6Al-4V grade 23
- Ti-6Al-2Sn-4Zr-2Mo
- Ti-5Al-5V-5Mo-3Cr
- Ni Alloy 718
- Ni Alloy 625
- Al-Si7-Mg (F357)
- Al-Si10-Mg

## Custom Spherical Powder Products

- Ti alloys
- Ti-5Al-2.5Sn (Grade 6)
- Nickel-titanium
- Molybdenum alloys
- Niobium alloys
- Zirconium alloys
- etc.

## Testing Capability

- Size distribution by sieving (ASTM B214)
- Size distribution by laser diffraction (ASTM B822)
- Flowability (ASTM B213 and ASTM B964)
- Apparent density (ASTM B212)
- Tap density (ASTM B527)
- Chemical composition (ASTM E1409, E1447, E1941, E2371 etc.)



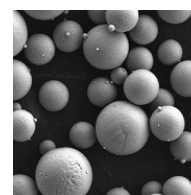
# AP&C standard powders

## High purity titanium: CpTi grade 1 and CpTi grade 2

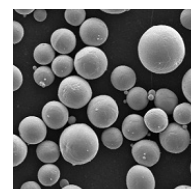
Powder chemistry may comply with standards: ASTM B348, ASTM F67, ASTM F1580. Typical particle size distributions (PSD): 0-20 µm, 15-45 µm, 15-53 µm, 20-63 µm, 45-106 µm, 45-150 µm

PSD	Size distribution by laser diffraction (ASTM B822)			Apparent density (ASTM B212)	Flow rate (ASTM B213)	Oxygen content	
	D10	D50	D90			Grade 1	Grade 2
0-20 µm	6 µm	12 µm	21 µm	2.7 g/cm <sup>3</sup> *	—	—	0.21%
15-45 µm	17 µm	32 µm	44 µm	2.55 g/cm <sup>3</sup>	29 s	0.16%	0.20%
15-53 µm	20 µm	41 µm	54 µm	2.60 g/cm <sup>3</sup>	29 s	0.15%	0.20%
20-63 µm	23 µm	44 µm	59 µm	2.56 g/cm <sup>3</sup>	27 s	0.12%	0.18%
45-106 µm	50 µm	74 µm	100 µm	2.61 g/cm <sup>3</sup>	25 s	0.10%	0.16%
45-150 µm	55 µm	82 µm	120 µm	2.62 g/cm <sup>3</sup>	25 s	0.10%	0.16%

\*Tap density per ASTM B527



AP&C CpTi grade 1  
15-45



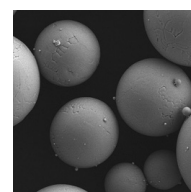
AP&C CpTi grade 2  
45-106

## Titanium alloys: Grade 5 and Grade 23

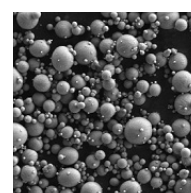
Powder chemistry may comply with standards: ASTM B348, ASTM F136, ASTM F1580, ASTM F2924, ASTM F3001, AMS 4998. Typical particle size distributions (PSD): 0-20 µm, 15-45 µm, 15-53 µm, 15-63 µm, 45-106 µm, 45-150 µm, 106-180 µm

PSD	Size distribution by laser diffraction (ASTM B822)			Apparent density (ASTM B212)	Flow rate (ASTM B213)	Oxygen content	
	D10	D50	D90			Grade 5	Grade 23
0-20 µm	6 µm	13 µm	19 µm	2.8 g/cm <sup>3</sup> *	—	0.19%	—
15-45 µm	20 µm	34 µm	44 µm	2.49 g/cm <sup>3</sup>	28 s	0.16%	0.11%
15-53 µm	23 µm	38 µm	52 µm	2.51 g/cm <sup>3</sup>	26 s	0.16%	0.11%
15-63 µm	24 µm	44 µm	61 µm	2.50 g/cm <sup>3</sup>	25 s	0.15%	0.10%
45-106 µm	52 µm	71 µm	102 µm	2.47 g/cm <sup>3</sup>	25 s	0.13%	0.08%
45-150 µm	54 µm	81 µm	123 µm	2.59 g/cm <sup>3</sup>	25 s	0.13%	0.08%

\*Tap density per ASTM B527



AP&C Ti-6Al-4V  
grade 23 15-45



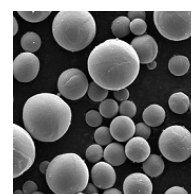
AP&C Ti-6Al-4V  
grade 5 45-106

## Nickel-based alloys: 625 & 718

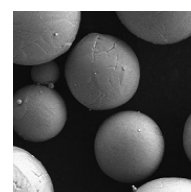
Powder chemistry may comply with standards: ASTM B472, ASTM B637, ASTM F3055, ASTM F3056, AMS 5596, AMS 5662, AMS 5666. Typical particle size distributions (PSD): 0-20 µm, 15-45 µm, 15-53 µm, 15-63 µm, 45-106 µm, 45-150 µm

PSD	Size distribution by laser diffraction (ASTM B822)			Apparent density (ASTM B212)	Flow rate (ASTM B213)
	D10	D50	D90		
0-20 µm	5 µm	10 µm	18 µm	5.0 g/cm <sup>3</sup> *	—
15-45 µm	20 µm	32 µm	43 µm	4.67 g/cm <sup>3</sup>	—
15-53 µm	25 µm	40 µm	53 µm	4.74 g/cm <sup>3</sup>	11 s
45-106 µm	52 µm	73 µm	105 µm	4.86 g/cm <sup>3</sup>	13 s
45-150 µm	52 µm	85 µm	137 µm	4.75 g/cm <sup>3</sup>	13 s

\*Tap density per ASTM B527



AP&C UNS N07718  
45-106



AP&C UNS N06625  
15-45

All information is based on typical values. It does not guarantee a particular outcome and is not binding.



## Aluminum: Al-Si7-Mg (F357) and Al-Si10-Mg

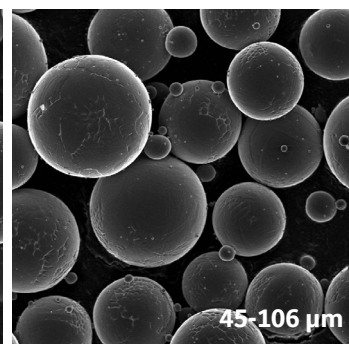
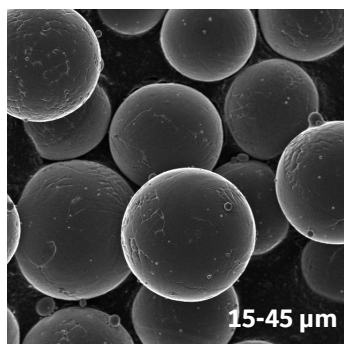
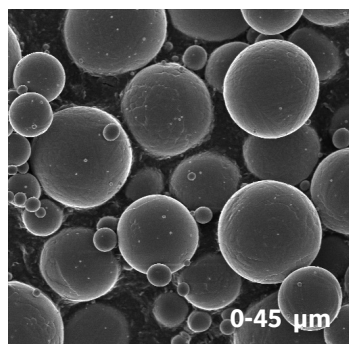
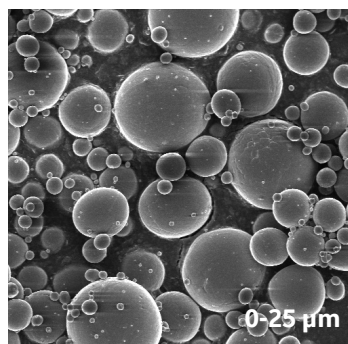
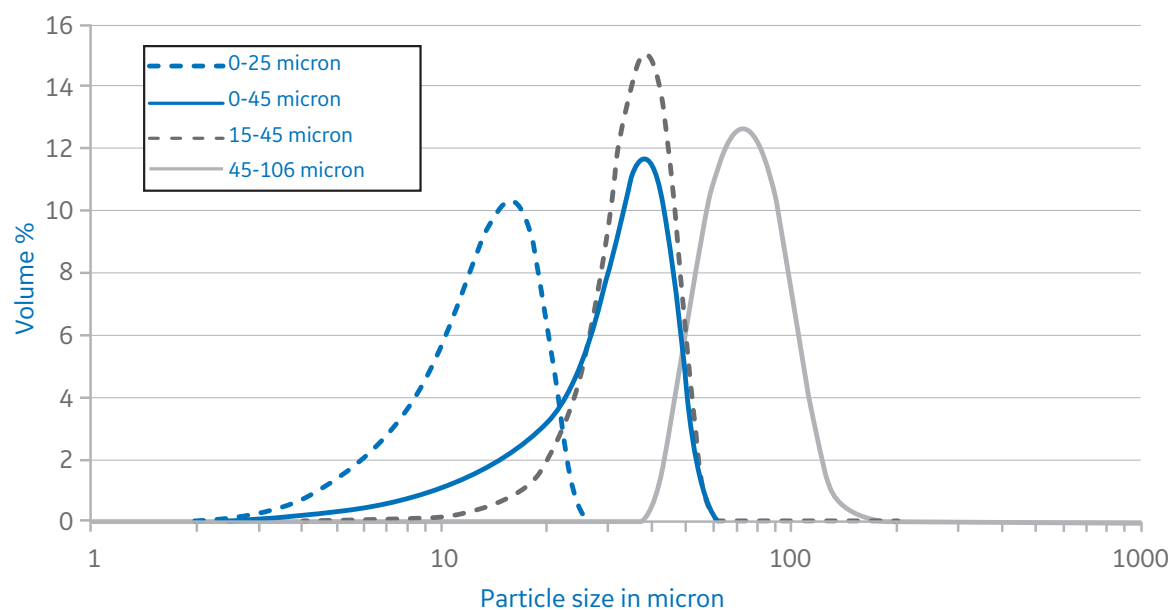
Powder chemistry may comply with standards: AMS 4282 or ASTM F3318. Typical particle size distributions (PSD): 15-53  $\mu\text{m}$  and 15-63  $\mu\text{m}$

PSD	Size distribution by laser diffraction (ASTM B822)			Apparent density ASTM B212*	Flow rate ASTM B213	Oxygen content
	D10	D50	D90			
15-53 $\mu\text{m}$	20 $\mu\text{m}$	35 $\mu\text{m}$	50 $\mu\text{m}$	1.49 g/cm <sup>3</sup>	109 s	0.07%
15-63 $\mu\text{m}$	19 $\mu\text{m}$	28 $\mu\text{m}$	63 $\mu\text{m}$	1.56 g/cm <sup>3</sup>	76 s	0.06%

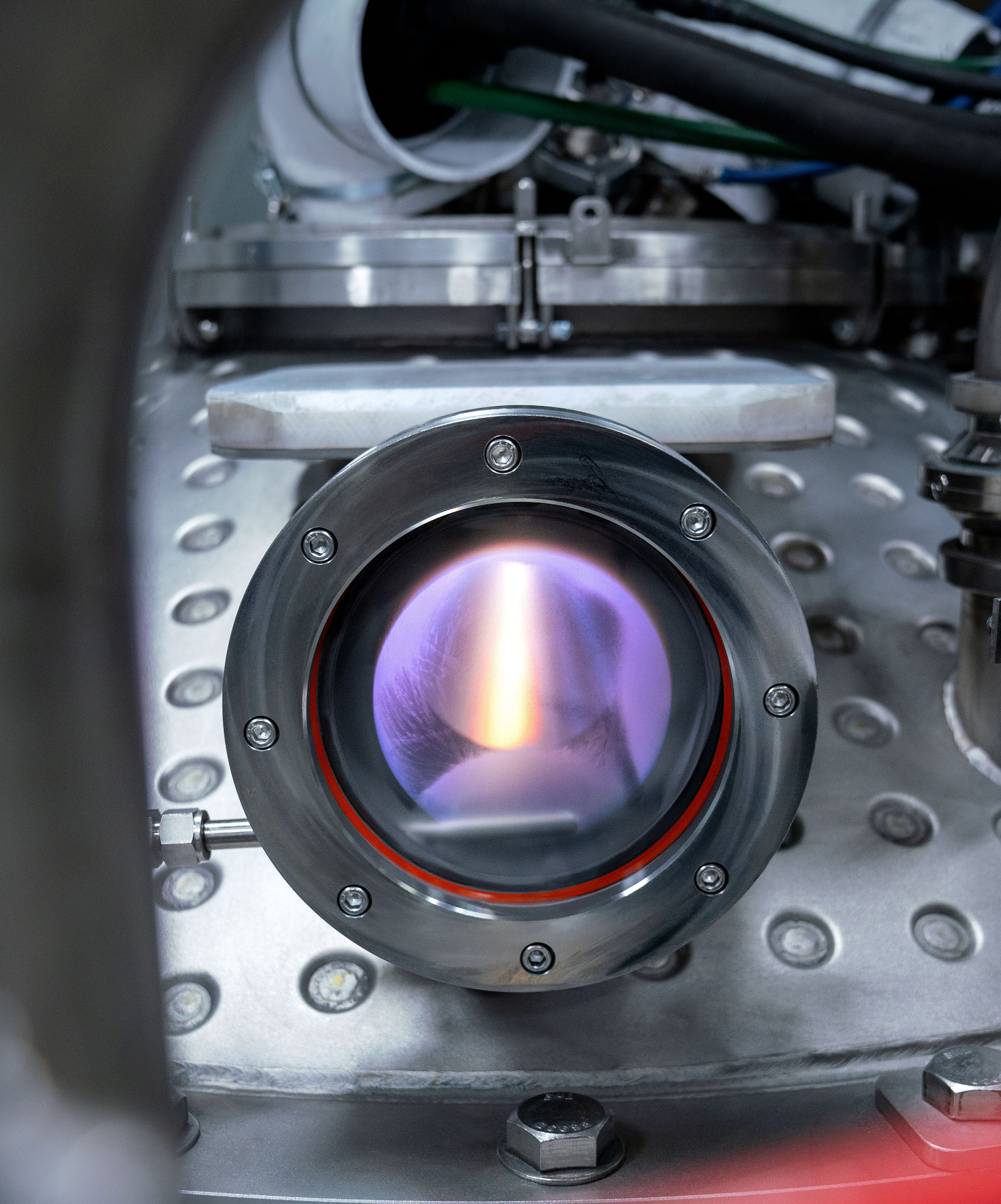
\* Tap Density per ASTM B527

### Standard size distributions:

- 0-20, 0-25 and 0-45 micron (MIM and coatings)
- 15-45, 15-53 and 15-63 micron (laser additive manufacturing or coatings)
- 45-106 micron (electron beam additive manufacturing)
- 45-150, 45-250 and 0-250 micron (DED and HIP)







[www.advancedpowders.com](http://www.advancedpowders.com)

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