





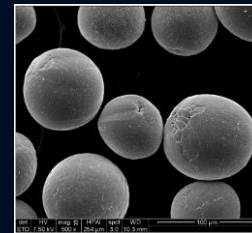
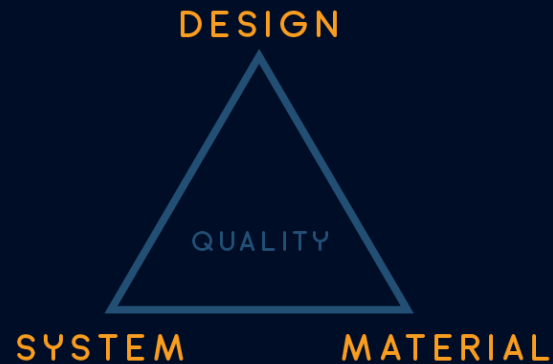
topolog³
SUBTRACTIVE TO
ADDITIVE VALUE

Challenges of Metal Additive manufacturing.

- Value-engineering,
• education / training.



- Investment / High
CAPEX,
• Throughput.



consistent quality.

- Particle size distribution.
- sphericity.

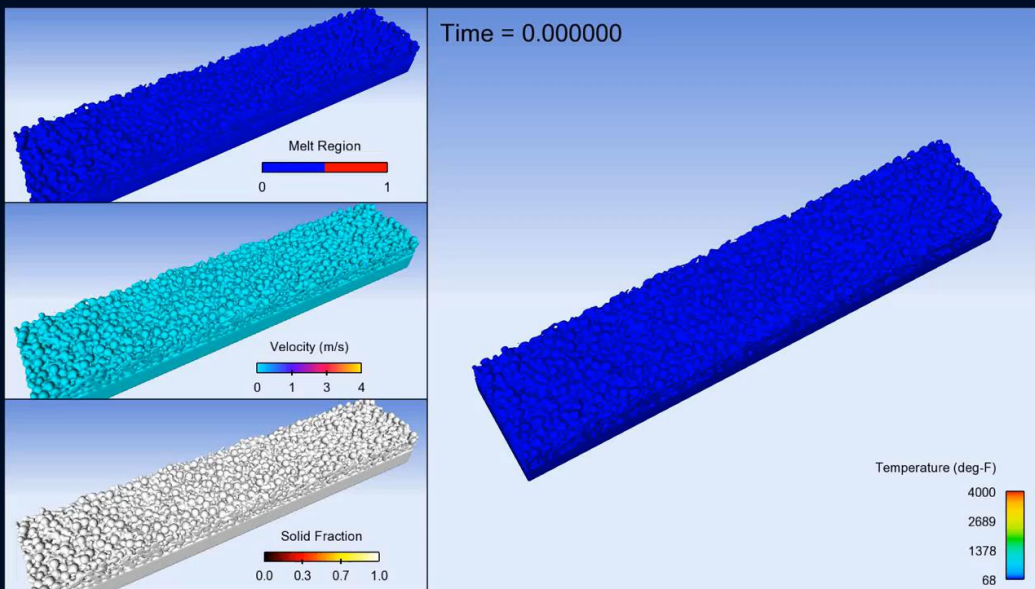
Sourcing.

- Waste of material.
- From waste to material.

Consequences of irregular A.M. powder



- Big particles not completely liquified during melting proces.
 - Thus lower scanning speed.
- Tension build-up creating vibrations during movement of the recoater.
 - Thus lower recoating speed.

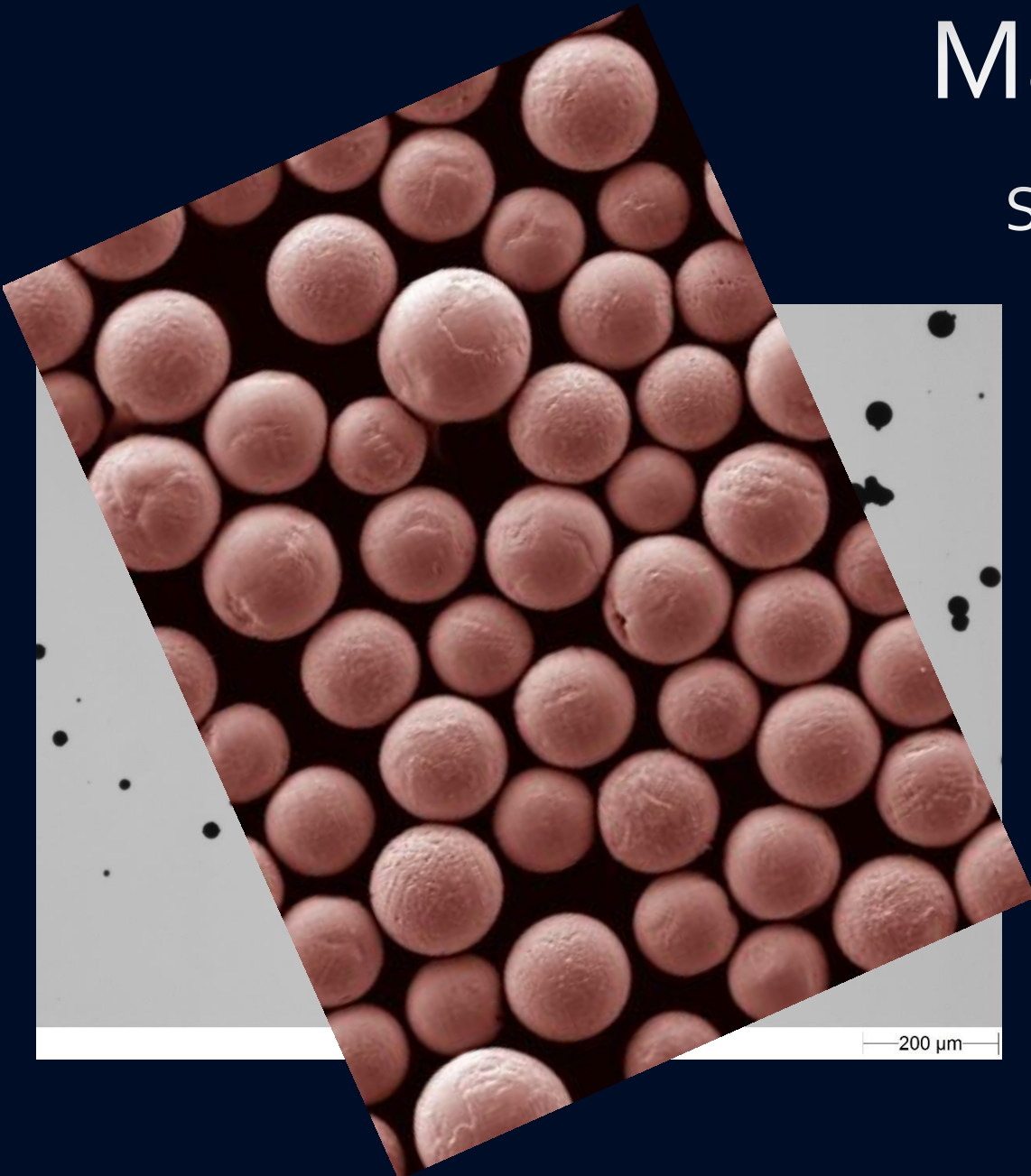


Resulting in a lower succesrate of the A.M . Build and a longer building time of the build

Materials

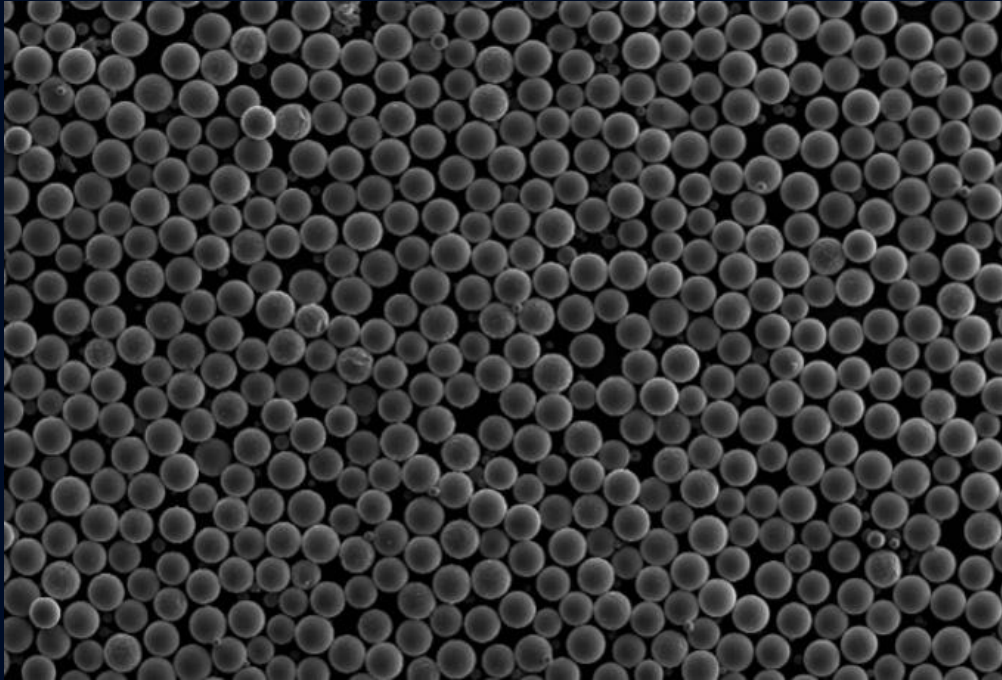
Sphericity

- Spherodisation of each individual particle.
- increasing flowability..
- Increased flowability = higher recoating speed.
- Optimum sphericity = increased density in the build.
- Lower building time, higher throughput.



Materials

Particle size distribution



- Controlled spread of particle Size Distribution.
- Smaller parts to start the melt,
- Bigger parts to increase density.
- increasing laser scanning speed by optimum Particle Size Distribution.
- Reliable operation, higher throughput.

sourcing

Waste off material

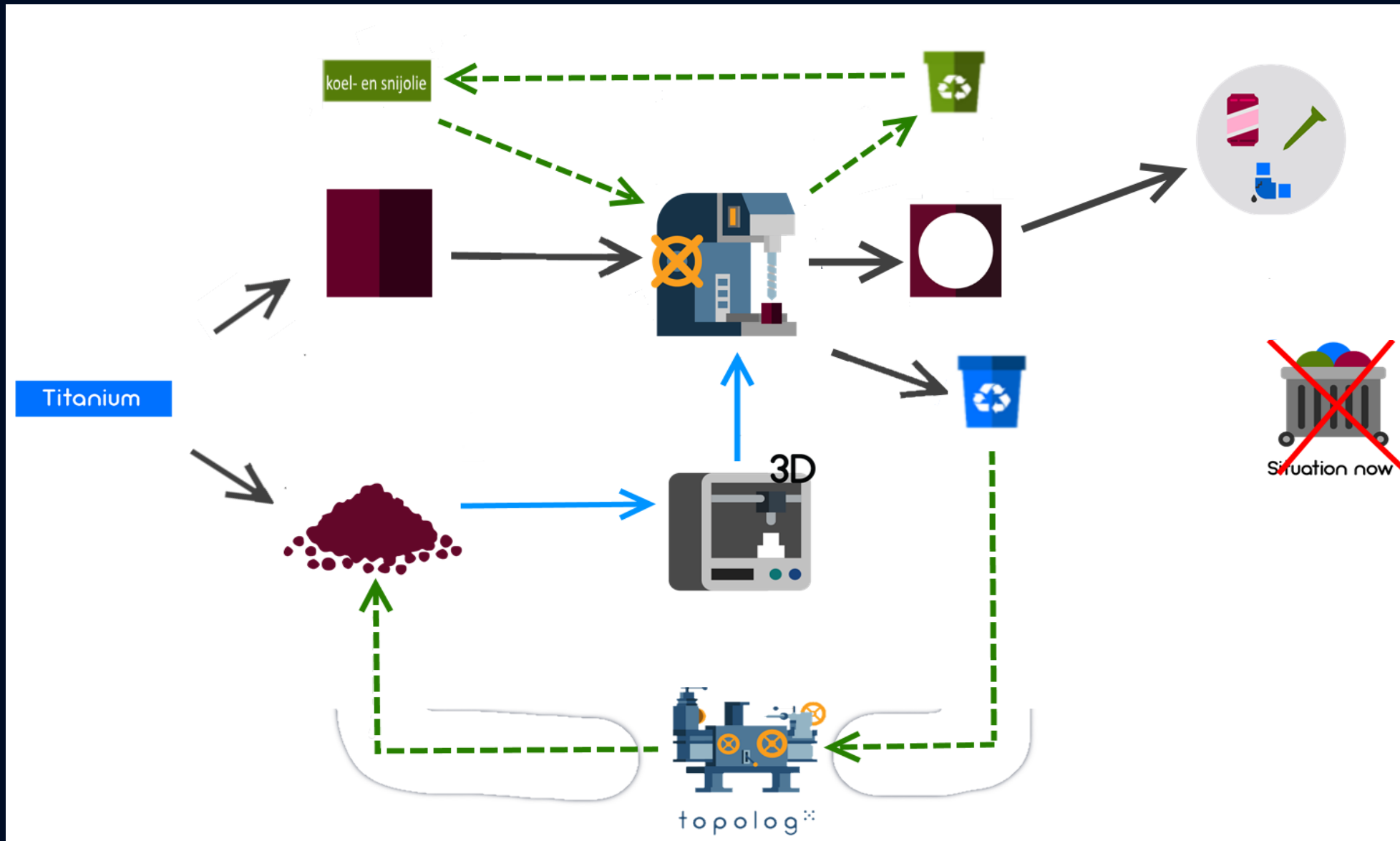
- 1,08 kg powder Ti64,
- 14,8 MJ / kg
- 175 – 600 € / kg

- 4,85 kg Mill product Ti64,
- 15,9 MJ / kg
- 30 – 60 € / kg



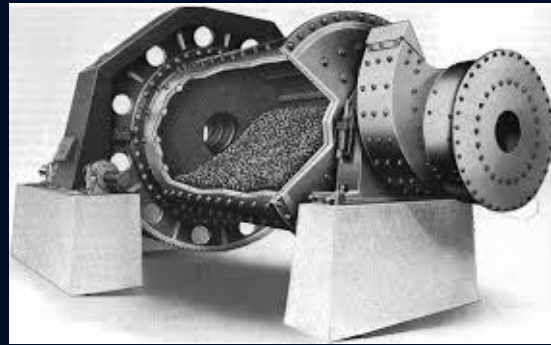
Waste chips, € 0,25 / kg

From waste to material



availability

How to ????



Sourcing suitable metal chips.

shredding

High-impact grinding

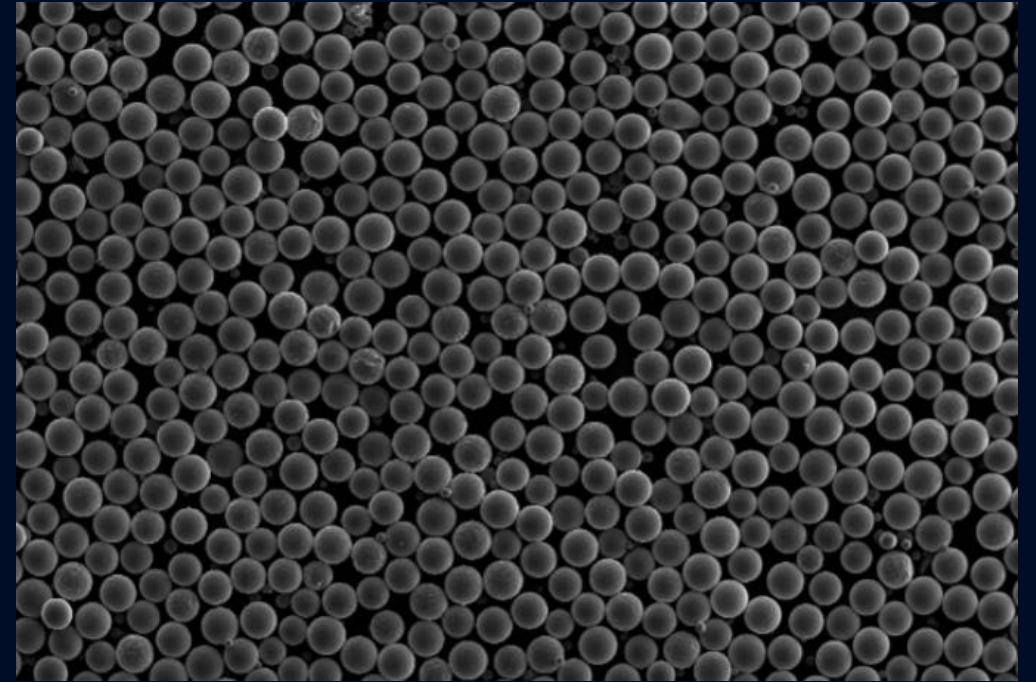
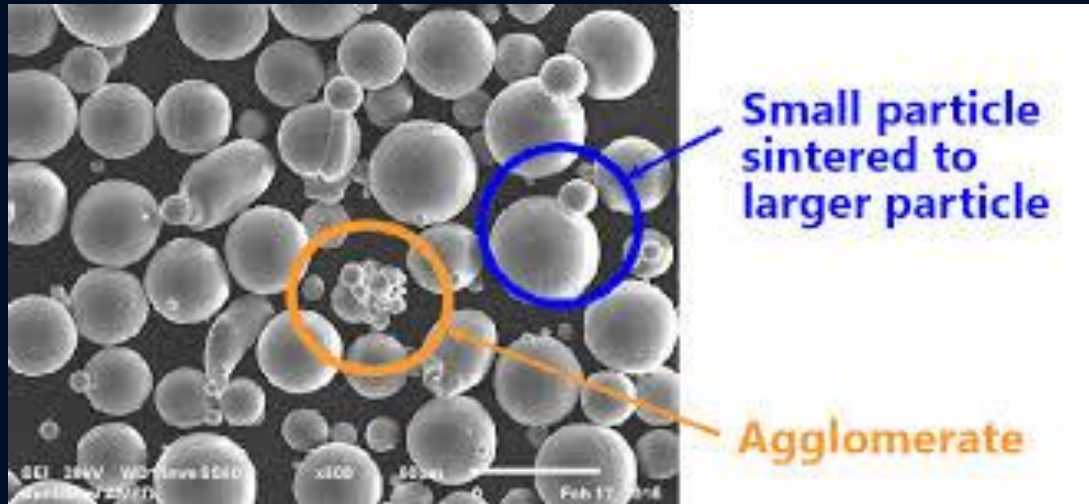
classifying

spherodisation

Classification & quality control



Gas-atomization Versus Plasma-Spherodisation.



Less satellite-parts.

Uniform round particles.

Better flowability, less downtime, higher throughput.

No Gas-inclusions.

Uniform predictable melting pool.

Better mechanical properties in the build.

topolog 

**Transform metals
into elements for the future.**

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Brightlands
Innovation Factory

Brightlands

Pedro Sterken

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topolog³

**Transforming metal waste
into elements for the future.**

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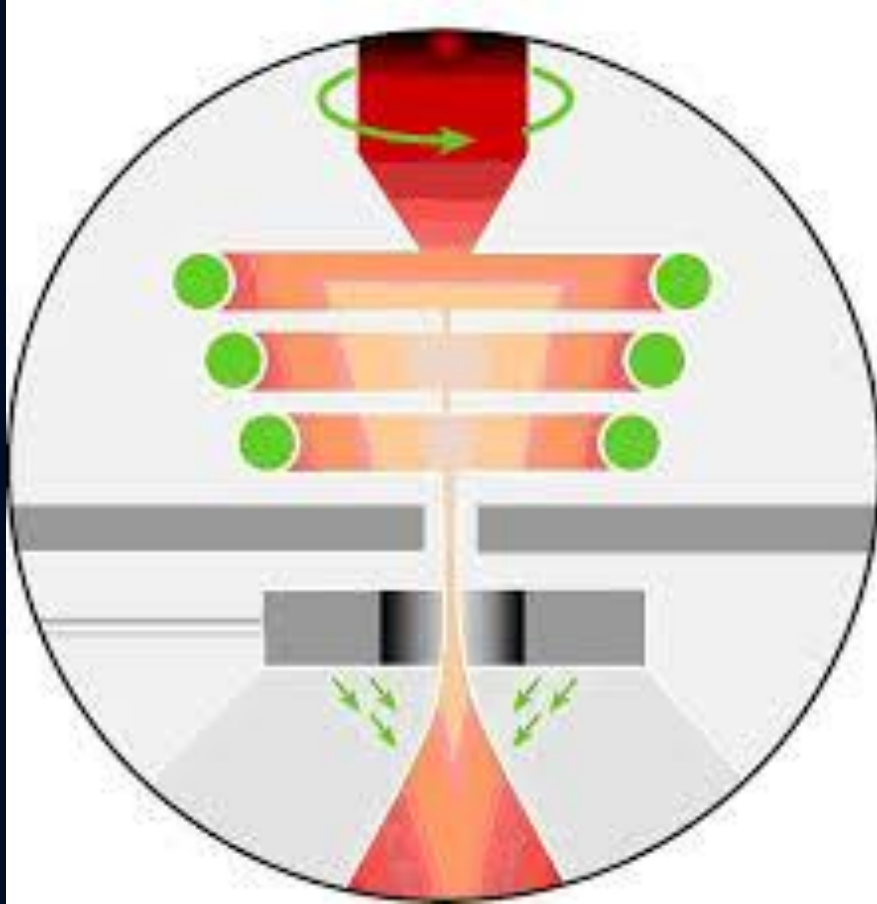
SUBTRACTIVE TO ADDITIVE VALUE

Yearly revenue.

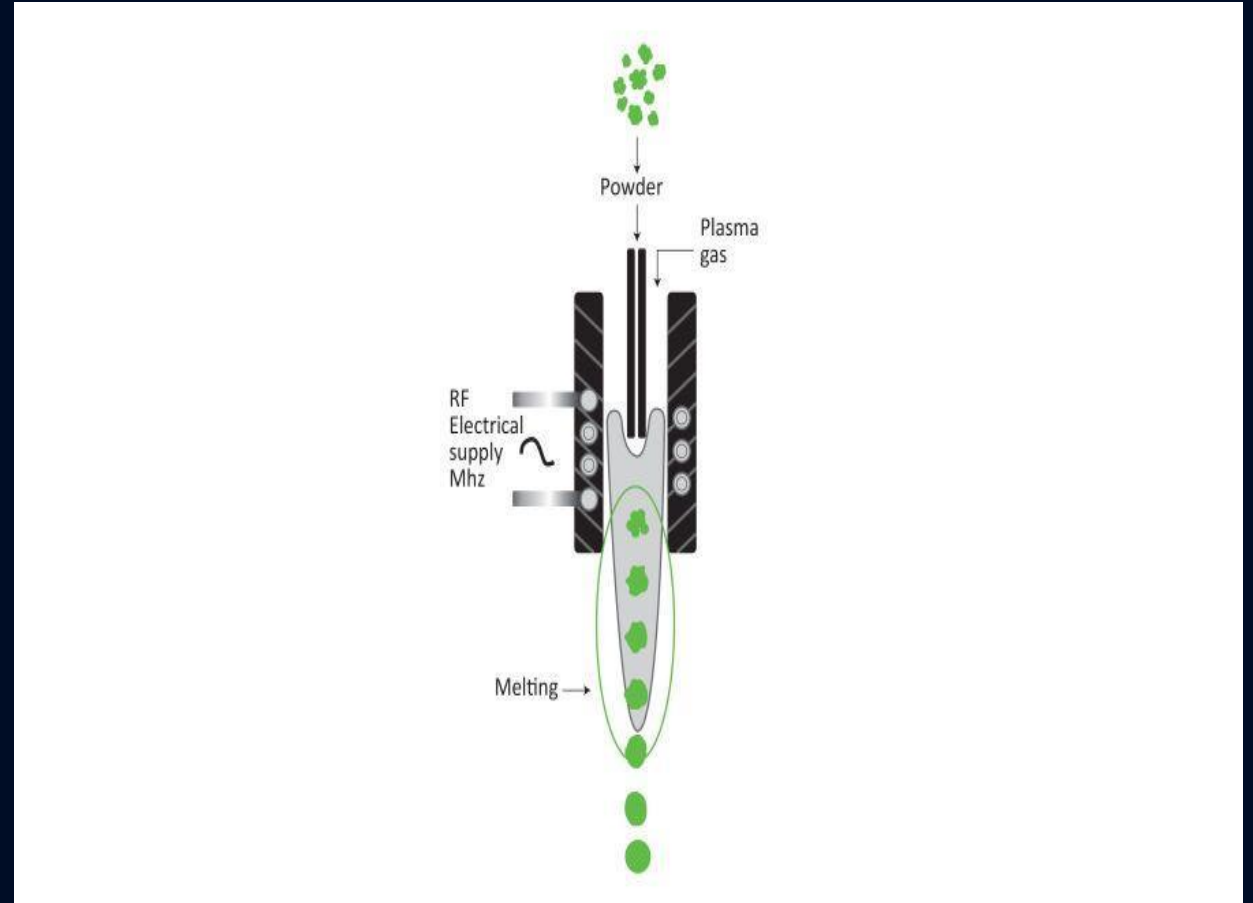
Huidige opbrengsten titanium schroot	€ 0,25 / Kilo.
LME prijs titanium	€ 3,87 / Kilo.
Kosten Titanium staf (Ø 60 x 500mm.)	€ 45,00 / Kilo.
Inkoop titanium schroot Mayfran / TopologX	€ 10,-- / Kilo
Verkoop Titanium Poeder voor AM	€ 480,-- / Kilo
Werkbare uren	5000

Flow	Verspaner		Mayfran /TopologX	Xilloc /TopologX
	Huidige opbrengsten	Extra opbrengsten	Inkoopvoordeel	Bruto marge
1 kg / uur	€ 1.750	€ 48.250	€ 142.500	€ 2.207.500
10 kg / uur	€ 17.500	€ 482.500	€ 1.425.000	€ 22.075.000
20 kg / uur	€ 35.000	€ 965.000	€ 2.850.000	€ 44.150.000

How does it work !



Gas-atomization



Plasma Spherodisation.