AM 4 AM

Advanced Materials
for
Additive Manufacturing

We create materials that shape the future

Production of New Metal Powders for Additive Manufacturing by Cold Plasma Technology : the Use Case of HiperAI

EPIC Meeting

15th of May 2023

AM4AM

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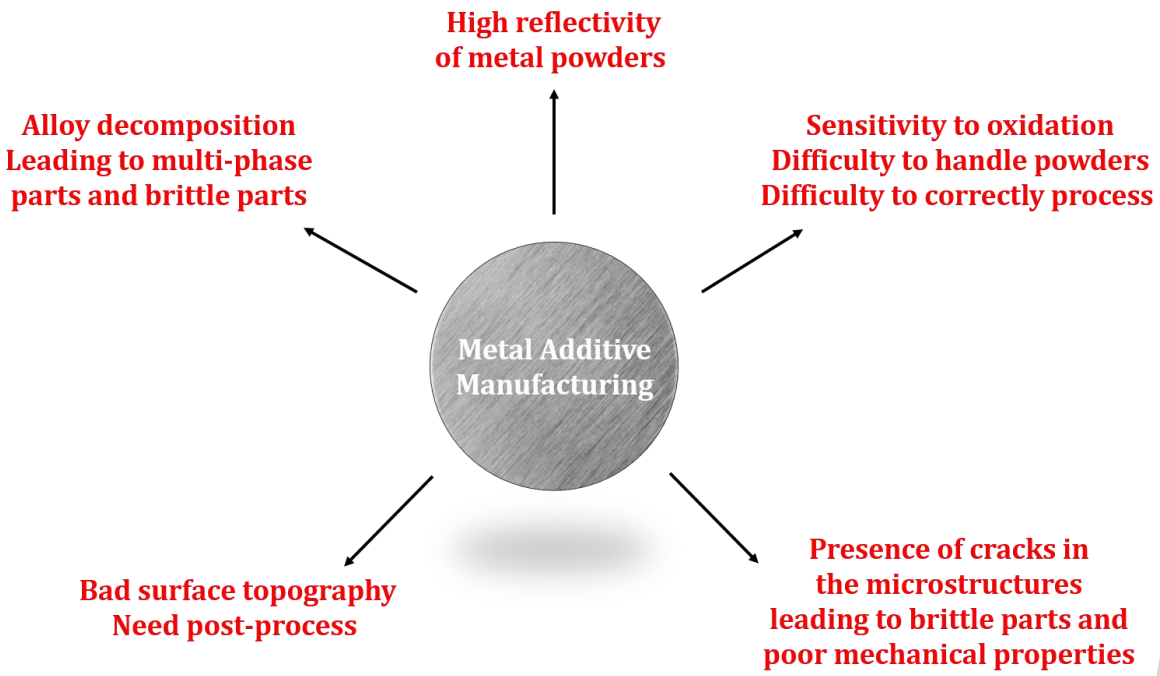
We create materials that shape the future

Challenge

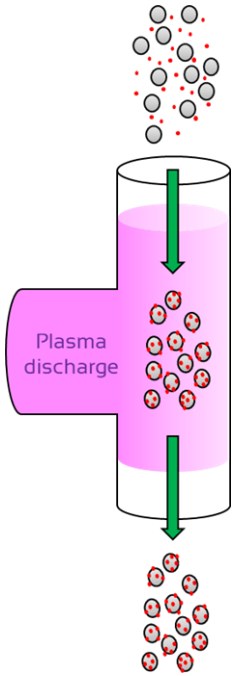


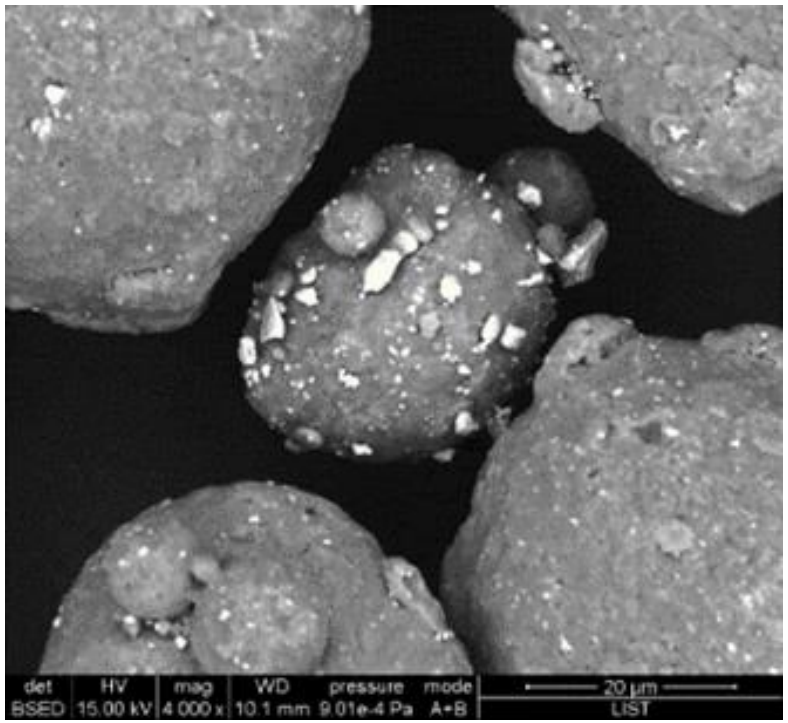
Constraints

- Laser/matter interaction
- High Thermal gradient
- Reactive materials

Our Innovative Technology

Our atmospheric cold plasma treatment (LU101177) allows the dispersion of ceramic particles on the surface of metallic powders to enhance the properties and processability of conventional alloys

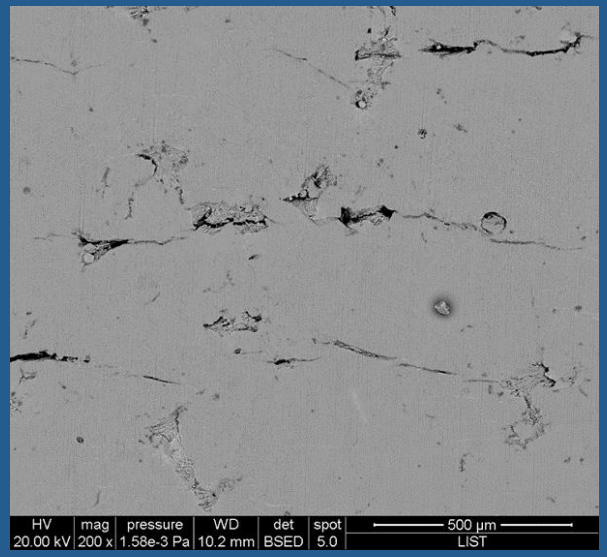




Our technology is…

- Making available **hundreds of conventional alloys**
- Creating **new alloys** designed for AM process
- Allowing **short time** alloy development
- **CO2 neutral**

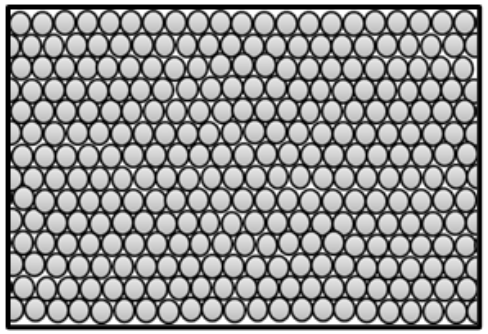
Aluminium in AM



Scanning Electron Microscopy of a 7000 series aluminum processed by Additive Manufacturing.

The microstructure is full of cracks and pores. These defects are bringing down the mechanical properties of printed parts

The major problem with aluminum is the cracks/porosity formation that leads to **brittle** parts and **inappropriate mechanical properties**



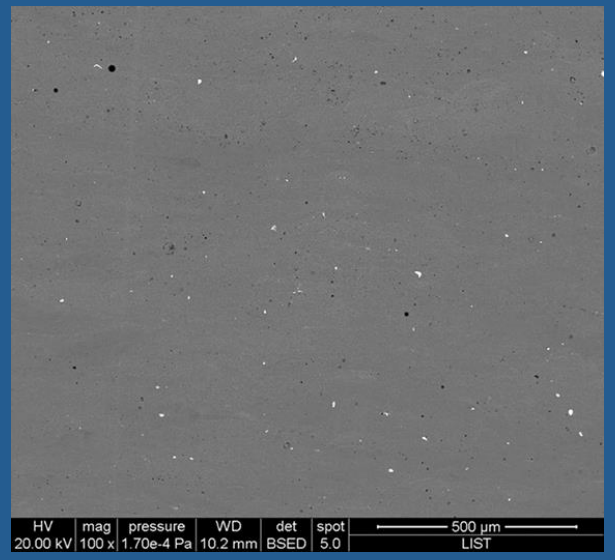
Conventional aluminum powder

Cracks/porosity due to the process constraints

Need of **new materials** designed specifically for additive manufacturing process

HiperAl

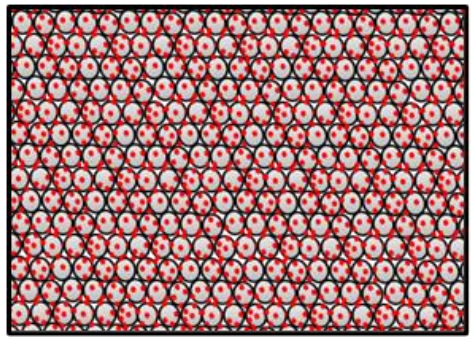
HiperAl



Scanning Electron Microscopy of a HiPerAl aluminum processed by Additive Manufacturing.

The microstructure is dense with no cracks. The mechanical properties of printed parts are maximized.

Our technology has been applied to aluminum alloy leading to our first product : **HiperAl**



HiperAl

Crack-free - Strong parts

- **Exceptional mechanical properties**
- **Corrosion resistant**
- **Compatible with the majority of AM equipment**

Mechanical properties

Yield Strength

AlSi10Mg – 230 MPa

HiperAl – 425 MPa

Ultimate Tensile Strength

AlSi10Mg – 350 MPa

HiperAl – 465 MPa

Elongation at break

AlSi10Mg – 11%

HiperAl – 4%

Main characteristics

HiperAl has been designed
to sustain additive manufacturing
constraints

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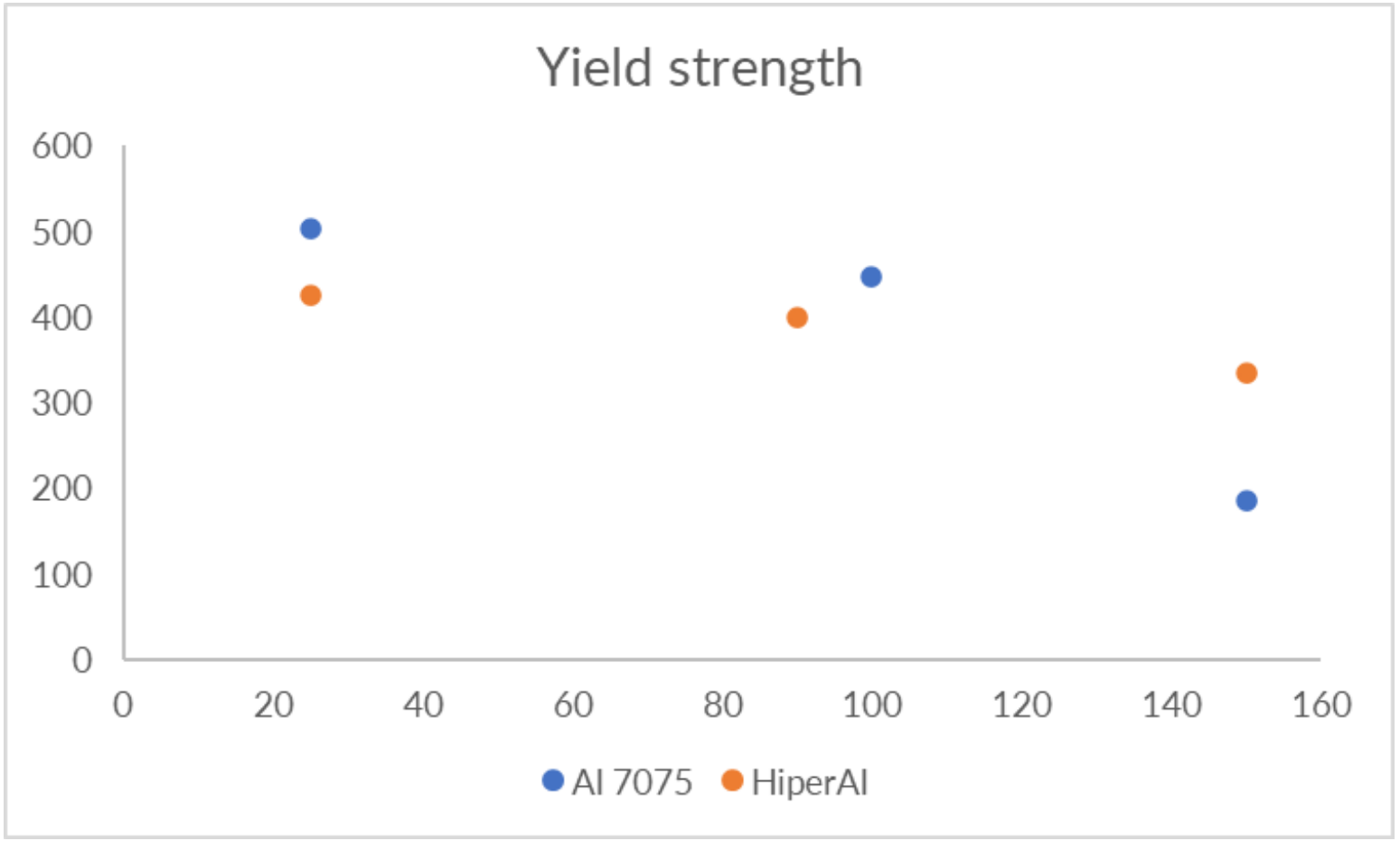
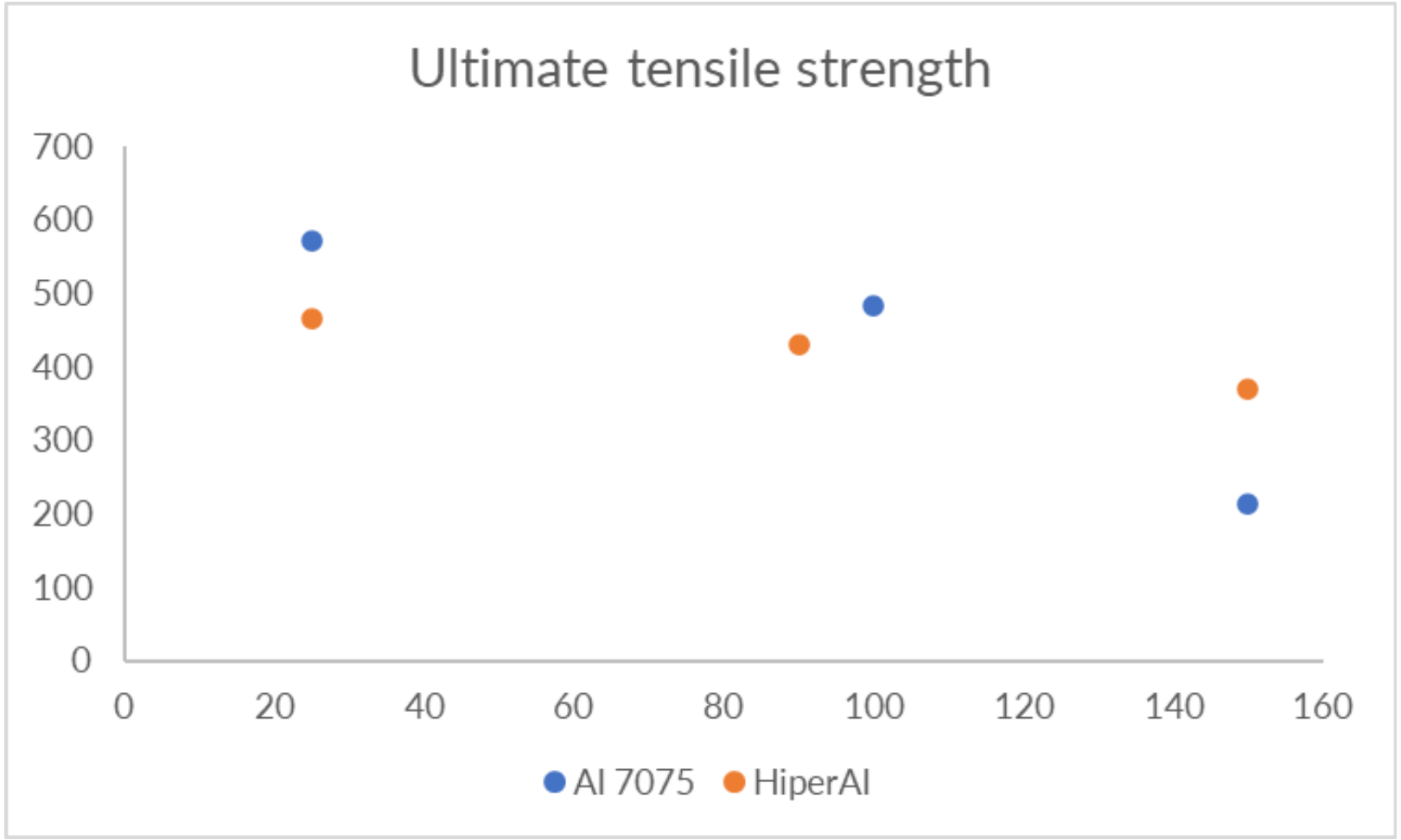
HiperAl vs 7075 mechanical properties



HiperAl vs 7075 mechanical properties



HiperAl vs 7075 mechanical properties