AUBERT&DUVAL

STELLAR
Metal powders by AUBERT & DUVAL

Stellar InvHard

Powder for Additive Manufacturing

MATERIAL OVERVIEW

Stellar InvHard is a cobalt free alloy with low thermal expansion combined with good mechanical properties. The alloy is developed for additive manufacturing and can replace Alloy 36 to reduce weight in applications such as:

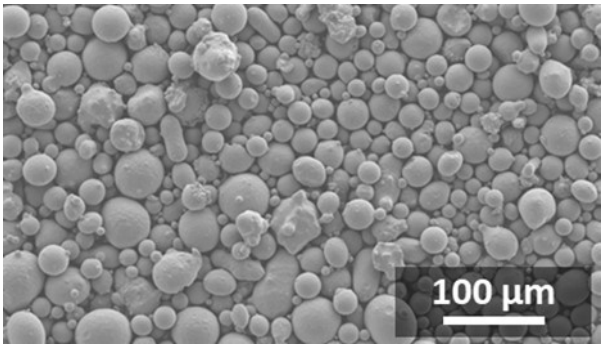
- Satellite components
- Laser components
- Precision instruments
- Precision tools
- Tooling for composites
- Cryogenic components

POWDER CHARACTERISTICS

Particle size distributions:

Laser Powder Bed Fusion (LPBF): 15-53 µm
Electron Beam Melting (EBM): 45-106 µm
Directed Energy Deposition (DED): 45-106 µm
Custom size distributions available on request

POWDER MORPHOLOGY



Typical powder morphology

CHEMICAL COMPOSITION

Wt%	Fe	Ni	Nb	C
Mini	Bal.	38	4	0
Maxi		42	6	0.2

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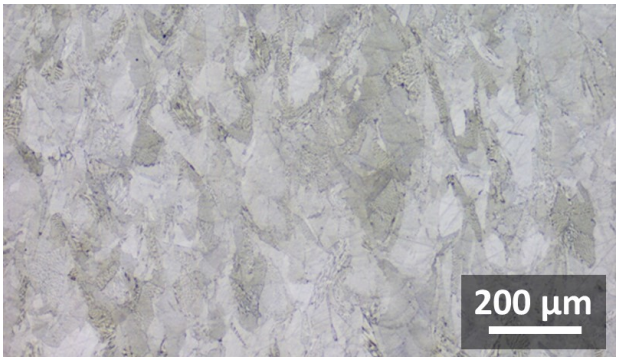
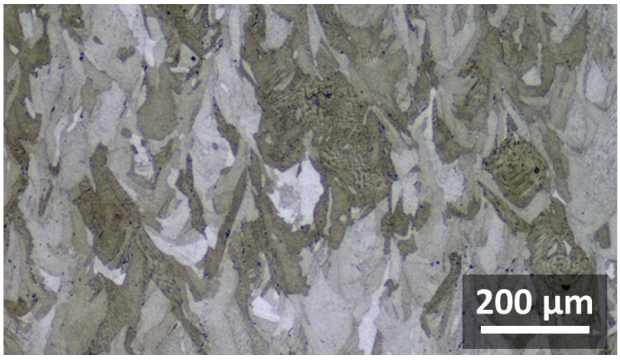
PRINTABILITY



As-build microstructure

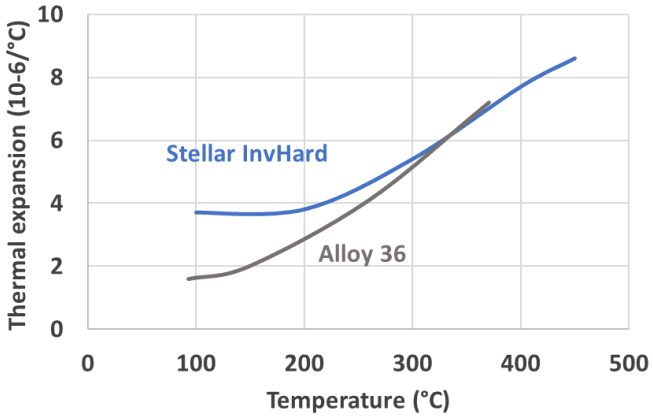
- Machine: EOS M290
- Layer thickness: 40 µm
- Energy density: 72 J/mm
- Density: 99,995%

HEAT TREATMENT AND HARDNESS

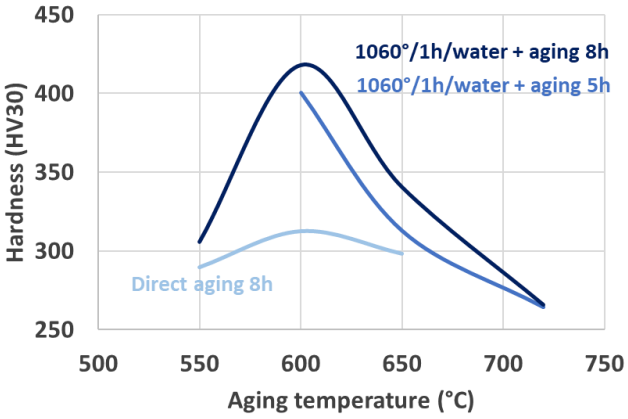


Microstructure of Stellar InvHard solution treated at 1060°C/1h/water followed by aging 600°C/8h/Air

THERMAL EXPANSION COEFFICIENT

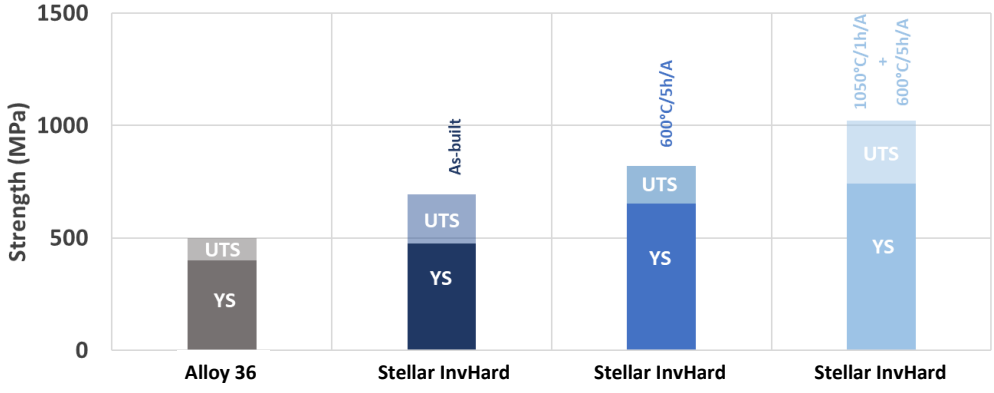


Thermal expansion coefficient for Stellar InvHard in as-built condition according to ASTM E228-17 (2017).
Data for Alloy 36 from the literature.



Stellar InvHard HV30 according to ASTM E384 or NF EN ISO6507-1for different thermal treatments.

TENSILE PROPERTIES



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