HYBRID PISTON

Dimensions: 102x92 mm
Weight: 2,3 kg

MASS

ASSEMBLY

ORGANIC SHAPE

GOAL :

Proof of concept : demonstrate the feasibility of a multi-material part made with PBF and DED

RÉSULTS:

- Multi-material part combining steel and Inconel 625
- Proven ability of PBF to create complex structures
- Proven ability of DED to add metal to an existing part

Steel & inconel® 625

CONTEXT:

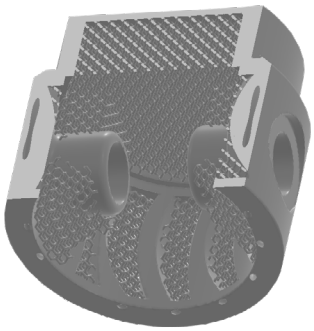
In 2019, AddUp and its subsidiary BeAM worked together to manufacture a high-performance piston concept using two metal additive manufacturing technologies: PBF (Powder Bed Fusion-Laser) and DED (Directed Energy Deposition- powder).

MULTI-TECHNOLOGIES AND MULTI-MATERIALS:

The demonstrator has a lower part made with PBF technology. The inside of the volume contains lattice structures to show the ability of PBF to produce low mass parts.

AddUp designers also integrated channels into the walls of the part to demonstrate the ability of the FormUp 350 machine to create complex internal channels.

Then, BeAM experts added a DED structure on top of a Magic 800 machine and developed a formula to weld Inconel 625 on steel, to prove the ability of DED to create coatings on existing parts improving their temperature resistance.



Sectional view of the inside of the part obtained with PBF (before addition of material with DED).

THE AddUP'S

This project demonstrates the ability of AddUp to produce a multi-materials part with two additive technologies.

Directed Energy Deposition

Improved wear resistance.
Inconel® 625 helps to withstand very high temperature.
Deposited fast with no support.

Power bed fusion

Improved performance.
Steel
Lattice helps to provide a lightweight structure.
Internal fluid channels assist in cooling.