AddUp
GLOBAL ADDITIVE SOLUTIONS

AddUp I Poly-Shape I BeAM

AddUp, by Fives and Michelin joint-venture.

How additive manufacturing helps industries to stay competitive?

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AN ALLIANCE BORN FROM AN INDUSTRIAL NEED. TWO COMPLEMENTARY TECHNOLOGIES

MICHELIN

Metal AM since 2005

fives

200 years of Industrial Engineering

AddUp

2016 Metal AM spin out

50/50 Joint Venture

Inherited expertise

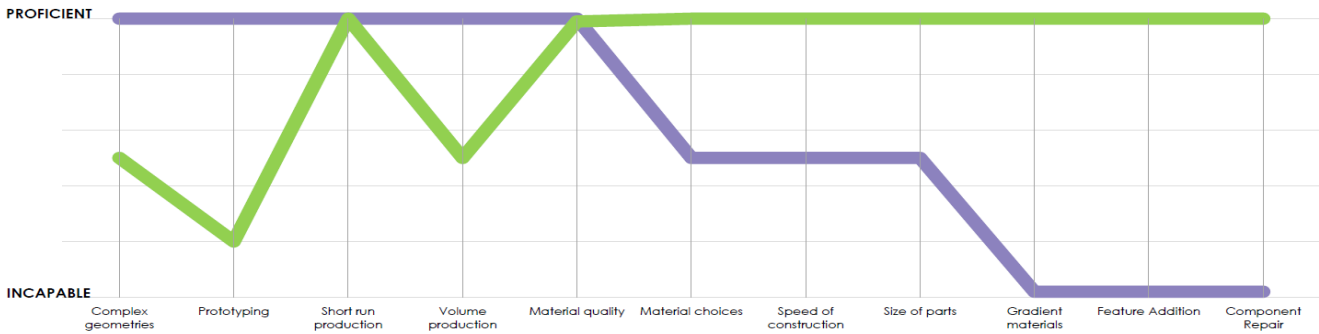
Located in France

We design PBF and DED machines and we deepen our experience in our production facilities

Machine manufacture **Parts manufacture**

FormUp® Range
PBF Technology

Modulo Range
DED Technology



How to generate value with Additive Manufacturing?

Strategy

Could AM be a lead to reinvent your business ?

- Co-creation
- On-demand production
- Customization

Technology

Could AM be a solution for your technical and economic barriers ?

- Delivery time reduction
- Digitalization of stocks
- Industrial simplification
- Development time reduction
- Cost reduction

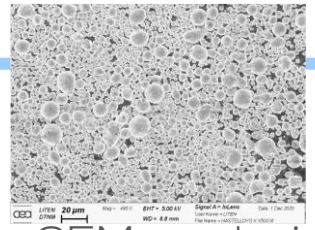
Product

Could AM be a solution to improve your product or a whole products system ?

- Energy efficiency improvement
- Function integration
- Weight reduction
- Visual features

Cycle of parts manufacturing

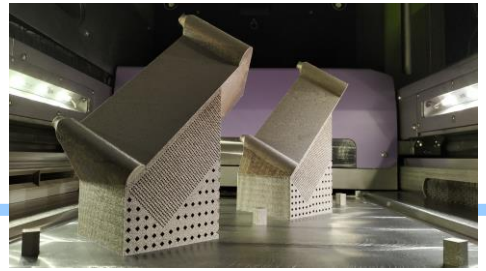
Material choice and characterization



SEM analysis

Process and equipment

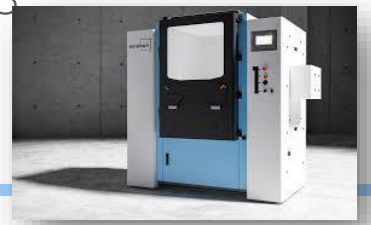
Software



Part manufacturing with required properties

Abrasive flow machining

Chemical finishing



Powder removing

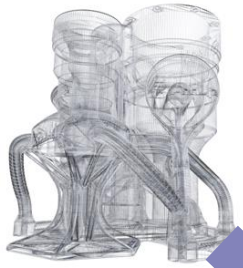
Post processing

Stress relief

Cutting

NUMERIC CONTINUITY

Our software solution are fully inter-operable along the production step from design to final part



DASSAULT SYSTEMES · AUTODESK NETFABB · NX · Materialise Magics

Design
AddUp Manager

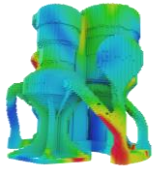
Inter-operability
AddUp "NTwin"

AddUp NTwin :
- Trajectory setting
- Production time
- Production file generation
- …

Final Part

Preparation

Simulation

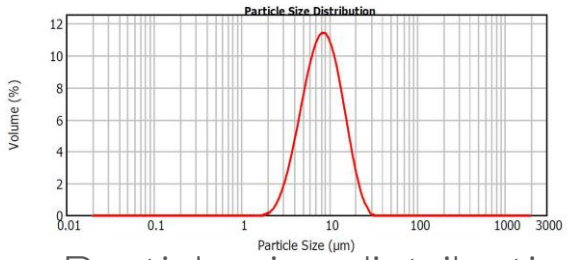


AddUp Manager

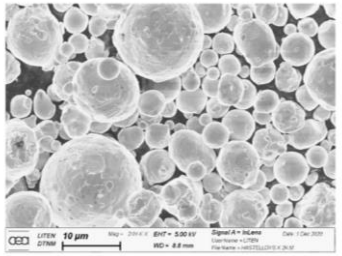
Production

+ Monitoring Layering
+ Monitoring Fusion

Powder characterization and materials datasheets



Particle size distribution



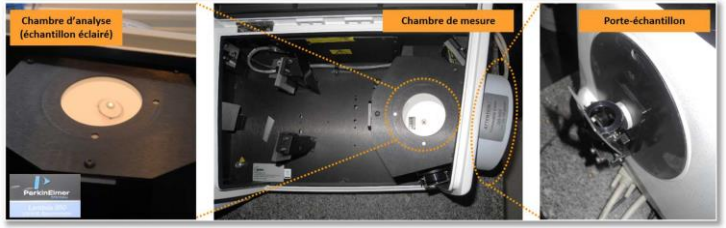
SEM analysis

Tap and apparent density

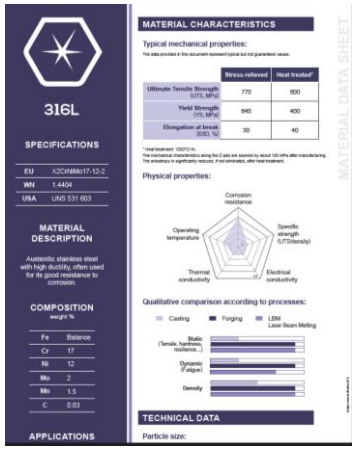
Paramètre	Exemples			
Ratio d'aspect (traduit l'allongement)	= 1	= 0,18	= 1	= 0,76

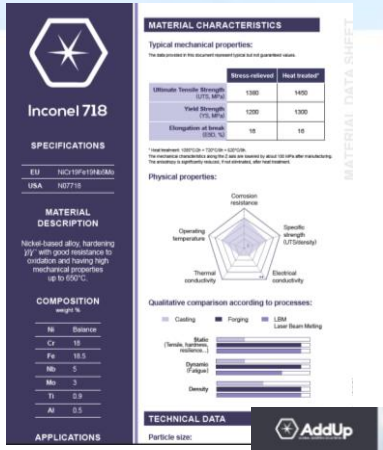
Particle shape

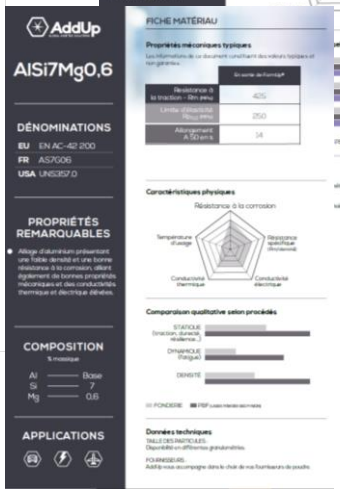
He pycnometer



Optical specnometer



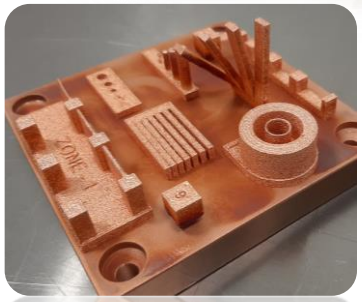


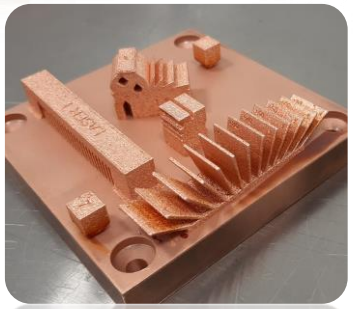


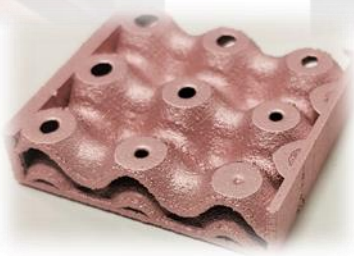
Development of new materials : pure Copper on FormUp 350

- Commercially Pure Copper on a FormUp 350 equipped with 1 KW fiber laser
- Machine build Volume = 350 x 350 x350 mm
- Porosity Level < 0,4%
- TRL : 4

	AddUp
Density	> 99,6 %
Electrical conductivity (w/o heat treatement)	> 94 % IACS
Tensile strenght (Rm) (w/o heat treatement)	225 MPa
Yield strenght (Rp 0,2) (w/o heat treatement)	145 Mpa
Elongation at break (A%)	50 %







*Results achieved in the frame of the project **AMBITION** in partnership with*

And with the financial support of

ORNMENT - DS7 CROSSBACK Louvre –Limited edition.

Manufacturing of 5 000 parts from 316L

- Manufacturing of 200 parts from 316L by a single built
- Full production time of a building plate: 21 hours
- Production time of a single part : less than 6 minutes

Collaboration between KIF Parechoc and AddUp

« Les sociétés partageront leurs savoir-faire dans les applications microtechniques et horlogères pour **développer ensemble des designs de pièces innovants et des réalisations de fonctions mécaniques inédites**. De la précision **du design et de l'impression** des pièces, à la minutie des **finitions et du contrôle**, ce partenariat saura répondre aux plus hautes exigences de nos clients. »

Thank you for your attention