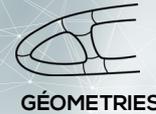


Dimensions: 223 x 94 x 76 mm  
Mass: 1,17 kg



## OBJECTIVE:

**Reduce the mass and optimize an aircraft floor bracket**

## RESULTS :

- Significant mass reduction of the part
- Part printed without any support
- Good surface condition

## CONTEXT:

AddUp has developed this demonstrator to illustrate both the value of 3D printing for the optimization of structural parts for aeronautics, and the advantages of the FormUp 350 machine which is able to produce this part without any manufacturing support.

## MASS REDUCTION THROUGH TOPOLOGY OPTIMIZATION

In order to introduce aeronautics manufacturers to the weight reductions made possible by 3D printing, AddUp engineers carried out a topological optimization study on an aircraft cabin floor support.

This part, which secures the cabin floor to the fuselage, is present in large quantities in all aircraft. Traditionally, this part weighing 3 kg is machined from a 12 kg metal block.

By applying the topological optimization technique, which allows to perform mechanical functions using the right amount of material required, AddUp engineers managed to obtain a part weighing only 1.17 kg, a mass reduction of 1.83 kg (-61%).

In addition, the additive manufacturing process does not generate any loss of raw material, unlike machining. The total gain in raw material for the optimized part is 10.83 kg.

## PRODUCTION TIME REDUCTION THANKS TO SUPPORT FREE MANUFACTURING

Thanks to FormUp 350 machines and their technology combining fine powder management and a roller layering device, the floor bracket can be manufactured without any support.

In most metal 3D printing machines, supports must be added to the part to produce surfaces with an inclination of less than 45° from the horizontal. These supports represent a significant cost.

On the part illustrated here, these supports would represent a loss of 250 g of raw material. In addition, there are significant manufacturing time savings: the presence of supports would have added three hours to the production time, and 30 minutes would have been required to remove these supports by machining.



**Stainless Steel 316L**

**Mass gain :  
-1,83 kg (61 %)**

**Production time: 11h30  
Metal powder: 50 µm  
No support melting required: -3 h  
No support removal required: -30 min**



Machined part: 3 Kg

## THE ADDUP ADVANTAGE

**Time and raw material savings thanks to a support free production, made possible by the use of the FormUp 350 with fine powder and a roller layering device.**