

## CHALLENGE: 3D printing of a complex ergonomic controller

## RESULTS:

Thanks to the use of a fine powder and a system of spreading the powder by a scraper, the part manufactured on the FormUp 350® machine has a low surface roughness, allowing the handle to be used immediately, without reworking.

The freedom of design linked to metal additive manufacturing allows the production of customised handles, of different dimensions, for right or left handed people, without tooling, thus limiting the costs and time of manufacturing the parts.

## CONTEXT:

The Joystick, a multi-axis handle is specially designed for the piloting of demanding vehicles (turrets, drones, lifting equipment, etc.) combining excellent ergonomics with a wide range of applications.

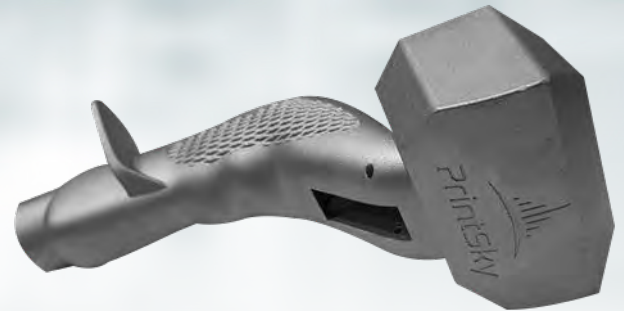
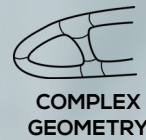
For this project, AddUp partnered with PrintSky who designed the flight stick to ensure the mechanical and manufacturability characteristics of the metal part would be met. The part has been designed to allow for the dimensions to be updated to suit the shape and grip of each driver, as well as the position and type of button for each application.

The part was optimized for the Powder Bed Fusion (L-PBF\*) process, reduced wall thickness of the handle down to just 1mm, compared to 3 mm for castings. The part was then printed on the FormUp 350 PBF machine.

## THE ADVANTAGES OF ADDITIVE MANUFACTURING

PBF technology is particularly suitable for applications that require customization, function integration and weight savings, while maintaining high mechanical strength.

This Joystick was made of 316L stainless steel and is remarkably strong and perfectly suited for off-road vehicles and machines. Its special grip makes it easy for the rider to grasp the handle. This part is a one-piece construction with modular inserts to provide design flexibility and ease of installation.



**316L  
Stainless steel**



Dimensions: 100 x 276 mm  
Mass: 380 g

CAD of the printed part

