Largest hybrid 3D printer in Europe will make parts for Skyora’s rockets

Custom-built Skyprint 2 will drastically reduce manufacturing time and produce parts up to 2.3 metres high when it starts production in Q2 2022

Skyrora has created Skyprint 2, the largest hybrid printer of its kind in Europe, to optimise the speed and efficiency of manufacturing rocket parts. By allowing printing and machining on the same bed, it will drastically reduce process complexity, cost and printing time by around 30% compared to other printers. Another key advantage of Skyprint 2 is that it can be manufactured via subtraction or addition processes, which means it can repair parts and machine items that were not originally printed.

Following on from Skyprint 1, and when it starts production in Q2, the bespoke Skyprint 2 will offer a cost-effective, bi-metallic, hybrid manufacturing service to meet the growing demand for small satellite launches and enables Skyrora to take full control of the manufacturing process. Skyrora’s vision is to meet this increasing appetite by combining proven technology with cutting-edge innovation in order to create economical, responsive access to space.

Skyprint 2 will use Inconel, a superalloy known for its mechanical strength at high heat which comprises most of the mass of Skyrora’s rocket engines and makes use of the Directed

Energy Deposition (DED) process. This is an additive manufacturing process in which focused thermal energy is used to fuse materials by melting as they are being deposited. One of the key features of Skyprint 2 is its 'near net shape' process of DED, which minimises material usage. Any residual material that would be otherwise lost due to blowout is instead collected and recycled, enabling greater material efficiency and making the manufacturing of parts more sustainable.

With standard, bulk methods of manufacturing Inconel alloy engine parts (oxidation-corrosion-resistant materials well suited for extreme environments subjected to pressure and heat), it can take around 10 weeks from concept to production, not to mention quality modifications. Using Skyprint 2, the time needed to manufacture key rocket engine components has been significantly reduced to only two weeks due to 3D printing's direct forming capabilities. Combined with the increased design dexterity – allowing for greater changes in design between iterations – Skyprint 2 is radically altering what is possible in hybrid manufacturing services.

Volodymyr Levykin, Skyrora's founder and CEO, said: "Skyprint 2 reinforces our ambitions to not only be the first company to launch from UK soil, but also to do so in the most sustainable way possible. By taking greater control of the design and manufacturing process of our parts using our custom-built industry-leading 3D printing technology, we are taking another crucial step closer to offering a significant space service from our own soil. Creating this cost- and time-effective solution encapsulates the innovation and talent that resides at the heart of the UK space industry. As an asset, Skyprint 2 is a real game-changer – it will transform Skyrora's operations and expand the limits of what is possible when it comes to space engineering in general."

Following Skyrora's announcement in October 2021 of a multi-launch agreement with SaxaVord that will enable the company to

complete 16 launches a year by 2030, the ability to fully design and print parts using Skyprint 2 will substantially reduce the timeframe needed for Skyrora to manufacture its rockets from 2022.

Earlier this year, Skyrora also successfully completed trials of the third stage of the Skyrora XL rocket, including its orbital transfer vehicle (OTV) – a vehicle that once in orbit can refire its engines around 15 times to complete tasks such as acting as a space tug or maintenance and de-orbiting of defunct satellites. The development of Ecosene – a rocket fuel made of otherwise unused plastics – also highlights the sustainable innovations that are at the core of Skyrora's business as it strives to solve the biggest issues facing the space industry.


SKYPRINT