

Press Release

Airbus APWorks launches the ‘Light Rider’: the world’s first 3D-printed motorcycle

Design inspired by nature

Ottobrunn, 20 May 2016 – From home décor to medical prosthetics, robotic parts to aircraft interiors, 3D printing is the future of manufacturing. APWorks, a 100% subsidiary of Airbus Group, has worked at the forefront of additive layer manufacturing (ALM) and advanced materials since its launch in 2013. APWorks produces bionically optimized metal parts for a wide range of industries, from aerospace to automotive and robotics. Its newest creation? The world’s first 3D-printed motorcycle, made using APWorks’ Scalmalloy® material, weighing in at a svelte 35 kg.

Dubbed the Light Rider, the new APWorks design has truly earned its name as a lightweight in its class. With a 6 kW electric motor powering it from zero to 80 km per hour in just seconds and a frame boasting a mere 6 kg, the world’s first 3D-printed electric motorcycle is 30% lighter than conventionally manufactured e-motorcycles.

3D-printing technologies have revolutionized the design and manufacturing process – not only in terms of structure and aesthetics, but also in impressive weight savings on parts and equipment when compared to those made using conventional manufacturing techniques. APWorks used an algorithm to develop the Light Rider’s optimized structure to keep weight at a minimum while ensuring the motorcycle’s frame was strong enough to handle the weight loads and stresses of everyday driving scenarios. The result: a motorcycle that looks more like an organic exoskeleton than a machine. That was a very deliberate design goal for APWorks, which programmed the algorithm to use bionic structures and natural growth processes and patterns as the basis for developing a strong but lightweight structure.

The Light Rider’s design echoes the form of a conventional motorcycle – but looks like a distant relative of today’s motorbikes. “The complex and branched hollow structure couldn’t have been produced using conventional production technologies such as milling or welding,” said Joachim Zettler, CEO of Airbus APWorks GmbH. “Advances in additive layer manufacturing have allowed us to realize the bionic design we envisioned for the motorcycle without having to make any major changes. With these technologies, the limitations facing conventional manufacturing disappear,” he added.

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Each 3D-printed part of the Light Rider's frame – produced using a selective 3D laser printing system that melts millions of aluminum alloy particles together – consists of thousands of thin layers just 60 microns thick. Leveraging the benefits of 3D-printing technology, APWorks designed frame parts that were hollow instead of solid, which has allowed for integrated cables, pipes and screw-on points in the finalized motorcycle structure – resulting in a dramatic 30% weight reduction over motorcycles produced using conventional manufacturing techniques.

“We further harnessed the benefits of metallic 3D printing by using our own proprietary material, Scalmetalloy®, for the construction of the frame,” said Zettler. Scalmetalloy® is a corrosion-resistant aluminum alloy that is virtually as strong as titanium. Specifically developed for ALM-based production, the material combines high strength with an extraordinary level of ductility, making it an especially interesting material to use for highly solicited parts in lightweight robotics, automotive and aerospace applications.

You don't have to wait long for the chance to ride the motorcycle of the future: APWorks is offering a limited production run of 50 Light Riders for sale, which can be pre-ordered at www.lightrider.apworks.de

About Airbus APWorks GmbH:

As a 100 % subsidiary of Airbus Group, Airbus APWorks is familiar with modern production processes, and makes proven aerospace technologies accessible in many different industries. In metallic 3D printing, or additive manufacturing, they cover the entire value chain, from optimized component design to the choice of suitable materials, from prototyping to qualified serial production. Their customers in robotics, mechanical engineering, automotive, medical technology and aerospace benefit from all the advantages that additive manufacture has to offer – the shortest possible production times and a reduction in weight and materials used for production. 3D printing also allows much more complex geometries than were previously possible. In addition to additive manufacturing, Airbus APWorks markets innovative projects and technologies from Airbus Group Innovations, the Group's global innovation network.

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