



DESIGNED FOR THOSE WHO MOVE

Facts

Challenge

To make a housing for a low-price engineering prototype or low-price small series.

Solution

Production of a jacket housing for a camera stabilizer mount with a FORMIGA P 110.

Results

- Faster: short production times using rapid prototyping
- Requirement-oriented: just-in-time production
- Flexible: production also possible in low run numbers



Jitter-free filming: the precision mechanics in the LUUV camera mount not only compensate for the cameraman's movements but also balance out external movements, such as those caused by gusts of wind (source: LUUV Forward GmbH).

No More Jittery Images – Innovative Camera Mount Produced by Additive Manufacturing



Start-up Company LUUV is Always in the Picture Thanks to EOS Technology

Short profile

LUUV Forward GmbH is a young start-up company based in Berlin. The company designs solutions for jitter-free filming – including high-speed action shots.

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The attraction of outdoor sports is all about thrills, dynamics and speed. Whether you prefer downhill mountain-biking or snowboarding, the important thing is that there is plenty of high energy at high speed. But if you have ever tried filming the kinds of stunts and jumps that sports like these involve using a smartphone or action cam, you will quickly realize that the equipment just isn't up to the job. This is something that Felix Kochbeck, CEO and developer at LUUV also realized: when it came to snowboarding in Zillertal/Austria, as an active sports enthusiasts he consistently failed to record his impressions on film smoothly and without jitters. Seeking a solution to the problem, he designed an ingenious, self-stabilizing mount, founded a company, and produced his first prototypes using EOS technology.

Challenge

It is usually a long and rocky road from an initial idea to a finished product. If after creating your start-up you take a step back and view your project within the big picture, you may easily be bitten by doubt, and wonder if you have made the right decision. Usually the problem is a combination of technical problems and, above all, a lack of money. And it is always a race – not only against time but

also against the (potential) competition. When Felix Kochbeck first began developing his groundbreaking camera mount, he was aware of these challenges right from the start. Yet he never wavered from his goal – to design a hand-held mount that could be used to effectively prevent jittery film images.

On the face of it, the principle seems simple enough: the camera

or smartphone is attached to the top end of a camera stabilizer mount, which bears a passing resemblance to an hourglass. A handle is attached to the neck section, which functions as the grip for the cameraman. The drop-shaped undersection conceals sophisticated precision mechanics, and it is this that gives the camera its stability, for instance by allowing it to compensate for the cameraman's movements or motion caused by gusts of wind. Also, action film directors don't lose their balance even when filming things at high speed. The principle is loosely related to that of the self-balancing two-wheel scooter, which is able to maintain the rider's equilibrium on a single axis. A further advantage of the construction is that it can be rotated only a few centimetres above the ground.

It wasn't just the precision mechanics that posed a challenge to the young businessman and his team. Even if the housing would appear to be a relatively simple construction, it presented



Smartphones or action cams can be attached to the camera mount made of PA 2200 plastic (source: LUUV Forward GmbH).

several design problems to Kochbeck right from the start: "What we wanted from the beginning was to work quickly and keep our sights set on our goal, to ensure that we would be able to get our product on the market as fast as possible. Moreover, as a start-up, it was very important for us to maintain strict cost-awareness." In the past, the construction of individual prototypes was a costly and time-consuming business. What the young LUUV crew needed was a viable alternative production technique. And they needed it quickly.

Solution

The housing had to satisfy all functional requirements, such as ergonomic design and mechanical resilience. And to be accepted for trendy outdoor use, it also had to have an attractive appearance. Requirements such as these are crying out for a production technique that is in itself highly innovative – Additive Manufacturing. This allows components to be made on the basis of 3D digital construction data by building up a body in successive layers of extremely fine plastic powder and fusing them by the application of a laser beam. One of the main features of this technology is its suitability for the production of prototypes with particularly stringent requirements in terms of functionality, time-to-market, and cost.

This is something that company founder Kochbeck realized very quickly: "We were aware that due to the special requirements of our product, the only solution for us was to employ an Additive Manufacturing process." For this reason, the decision was taken to purchase a 3D printer in addition to placing other smaller orders for tools and materials; indeed these were the chief investment of the Berlin start-up. The device functions on the principle of Fused Deposition Modelling (FDM). Kochbeck continues: "The process was very suitable for producing our first functional models. However, in the course of our development, we quickly reached the point at which we needed an industrially produced small series."

Because FDM printers are unable to produce the level of quality required for professional use, the LUUV founders quickly discovered to EOS, the technological leaders when it comes to Additive Manufacturing. The central aspects behind this decision were that the product's aesthetics and mechanical properties had to be at a professional level of quality. Moreover, the EOS solution offered them additional advantages such as just-in-time production and ease of component modification. This fast design change allows the LUUV team to continually incorporate customer feedback in their product. To sum up, the

production process had now been established, so all that remained was to build up the 3D model – already completed using CAD software – layer by layer using laser technology.

Results

This production method offers the start-up great advantages, as Kochbeck confirms: "We have no set-up costs, for instance for injection moulds. We can employ component geometries that would not be possible using other manufacturing techniques. And we can make changes to parts during the ongoing production or prototyping process." For instance, the team were able to considerably reduce the size of the mount, thanks to their ability to perform intensive testing with the various prototypes. The tenth prototype generation is currently in test operation, something which would be barely imaginable using traditional production methods.

EOS machines were employed to produce a small prototype series. Or to be more precise, the *jacket* of the LUUV stabilizer mount originates from an EOS system, while the precision mechanics are concealed in the interior. Kochbeck is already planning to use Additive Manufacturing for LUUV's serial production. A crowd-funding campaign is currently ongoing. The technology has taken hold of the young company.

In future, sports enthusiasts around the world will be able to use their action cams and smartphones for filming in a far greater range of situations. Professional looking films taken by hand – a real innovation. Spectacular snowboarding jumps can now be captured with the image quality that they deserve. And EOS technology is playing its role by employing its unique properties and capabilities in turning visions into reality.

"I got the idea for my camera stabilizer mount while on a snowboarding holiday in Zillertal/Austria nearly two years ago. I am a fun sports enthusiast and up to that point I had never found an easy way of capturing my impressions on camera. But the LUUV mount will change all of this. Additive Manufacturing was clearly the ideal technique for cheaply and quickly producing prototypes and small product series. Quality, mechanical properties, customizability and cost – all of these factors make it a great technology, particularly for start-ups."

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