

Stuttgart, 15th September 2016

PRESS RELEASE

ThinKing July – Decisive weight advantage in Rio – German 3D printing company builds lighter bicycle handlebar stems for the German track cycling team

Every gram makes a difference on the tough road to the podium in Olympic cycling. The less mass that needs to be moved, the faster the cyclists can accelerate. The German high-tech bicycles produced for this year's Olympic Games in Rio de Janeiro use parts produced by the Reutlingen based company 3D-Laserdruck to provide a crucial weight reduction.

The construction of the handlebar stems is optimized to minimize weight and has only half the mass of the original parts. In exact terms, the weight was reduced by about 160 grams. It may not seem like much at first glance, but in competitive sports where every hundredth of a second counts, so does every single gram.

3D-Laserdruck is a service provider in the area of metal selective laser melting (SLM). The SLM process involves creating components by melting thin layers of strong metal powder in a 3D printer. The layers themselves are only 0.05 mm (= 50 µm) thick. These layers are added together to create homogenous and versatile components which have similar performance properties to conventionally manufactured components but with significantly less weight.

Components are 3D printed according to the needs of the athletes

The weight reduction is achieved by creating a honeycomb form on the interior of the handlebar stem. The covering is manufactured in the 3D printer out of an aluminium alloy and creates a torsion-resistant connection with the lightweight carbon frame. The SLM procedure is well suited for the production of metal components with complex geometries.

By utilizing the additive procedure it is also possible to adapt the handlebar stem to the individual attributes of each cyclist (e.g. body size, sitting position, general ergonomics) as well as the technical conditions (e.g. bicycle geometry, frame height) for all eighteen members of the German track cycling team. These small adjustments result in significant advantages in the transformation of muscle power into speed.

The low weight handlebar stems were developed at the FES Institut für Forschung und Entwicklung von Sportgeräten in Berlin together with the specialists from 3D-Laserdruck. The engineers in Reutlingen were involved in the process from the very beginning, working together with FES to design and build the low-weight forms using cutting-edge technology.

Parts are produced and delivered in two months

The application of the forces acting on the component and bicycle in the oval track was simulated using the finite element method (FEM) in several stages. The component was optimized in later stages according to the results of the simulations. The additive production procedure also proved to be a time saver. After the development and testing stages, the handlebar stems could be completed and delivered to the athletes within two months.

Photos



Captions: (left) The SLM procedures is well suited for the production of metal components with complex geometries. / (right) After the development and testing stages, the handlebar stems could be completed and delivered to the athletes within two months. Sources: 3D-Laserdruck Photos in a higher resolution and other motives are available from mirko.hertrich@leichtbau-bw.de or can be downloaded from <http://www.leichtbaubw.de/en/press/releases.html>.

If you use this information in your own reporting, we would be happy if you could provide us with a reference or a copy of your report. If you would like to request an exclusive professional article on this topic or any other specific topic, please contact us. We are happy to help you with any questions or to refer you to one of our contacts.

Editorial Contct:

Development Agency for Lightweighting Baden-Wuerttemberg

Media and Public Relations

Breitscheidstraße 4

D- 70174 Stuttgart

Tel.: +49 711 – 128 988-46

Mob.: +49 151 – 5060 36 53

mirko.hertrich@leichtbau-bw.de

www.leichtbau-bw.de/en