BigRep Premieres Innovative 3D-Printed Prototypes for E-Mobility and Automation Applications: Showcasing a New Dimension of Additive Manufacturing.

3D printing thought and innovation leader BigRep showcases the world's first fully (FFF) 3D-printed, functional e-motorcycle and bionic passenger seat, as well as an adaptive robotic gripper and 360° mobile industry platform for automation applications.

Berlin/Frankfurt am Main, 13 November 2018 - BigRep, the global leader in large-scale 3D printing, premiers a host of innovative 3D-printed prototypes for automation and e-mobility applications at *formnext*, the world's leading exhibition for Additive Manufacturing (AM).

Opening a new dimension for Additive Manufacturing, these prototypes, designed by NOWlab, the BigRep innovation consultancy and printed on BigRep's large-scale 3D printers, include two groundbreaking prototypes for e-mobility applications: the world's first fully 3D-printed and functional electric motorcycle, the NERA, and a bionic passenger seat, the Aero Seat. Advancing applications in AM are two other new prototypes, the Adaptive Robotic Gripper, designed for flexible handling applications, and the Omni Platform, a 360° mobile industry platform for fully automated manufacturing environments.

"These exciting prototypes not only demonstrate the unprecedented capacity of FFF large-scale 3D printing technology in Additive Manufacturing", said Stephan Beyer, PhD, CEO of BigRep GmbH." They also emphasize our unique ability as the market's innovation and thought leader to bring cutting-edge technologies from design to reality, providing an added-value market lead for our industrial customers."

Using 3D printing technology for cutting-edge e-mobility solutions, BigRep has developed the world's first fully (FFF) 3D-printed and functional e-motorcycle, the **NERA e-motorcycle.** As a distinction from similar prototypes, all NERA parts, excluding electrical components, have been 3D-printed, including tires, rims, frame, fork and seat.

"The NERA combines several innovations developed by NOWlab, such as the airless tire, functional integration and embedded sensor technology", explained Daniel Büning, co-founder and Managing Director of NOWlab. "This bike and our other prototypes push the limits of engineering creativity and will reshape AM technology as we know it."

NERA illustrates the massive benefits that 3D printing offers for the production of end-use parts, particularly for batch sizes between lot size one to small series, by reducing lead times and costs, optimizing supply chains and limiting dependency on supplier networks.

In building NERA, the engineers didn't simply adapt existing motorcycle designs, but instead envisioned a bike for large-format FFF technology, setting a benchmark for truly creative design; breaking the limits of traditional mechanical engineering. Among the many innovations featured in NERA are the airless tires with customized tread; a lightweight rhomboid wheel rim, as well as flexible bumpers (instead of suspension) and the electric engine, which is fitted in a customizable case.

Another prototype for an e-mobility application is BigRep's **Aero Seat**, based on aerospace developments, a game-changing passenger seat for autonomous driving technology. This exciting seat shell design has an almost bionic touch, look and feel as the seat adapts to the driver's individual body shape: using a 3D body scan prior to the seat production, the shell will provide its users with an unprecedented level of comfort to reduce the stress and physical discomfort of long-distance travel. Last but not least, flexible material (TPU) was used for printing the seat cushions, which molds to the passenger's body shape. In addition, they are attached to the shell using only a few fixing points to reduce vibrations.

The **Adaptive Robotic Gripper** has been designed to advance the full integration of robotics into automated AM, more specifically to grip finished parts from BigRep printers. Created on a BigRep STUDIO large-scale printer, the bionic gripper is mounted on a robotic arm. The gripper has three modular fingers and an opposable thumb and is capable of handling objects of any shape by wrapping its "fingers" around it instead of using excess force. It is responsive to pressure with a force-monitoring system that automatically adjusts its grip.

The bionic design of the robotic finger tips is inspired by the lamellae of geckos, that helps them climb walls: each finger segment of the robotic gripper has an additional pad made of flexible lamellae. When force is applied these fine rib structures gently hold the gripped object by their restoring force.

The equally innovative **Omni Platform** is a 360° mobile industry platform (size: 100 by 80 cm) for highly flexible applications, in automated manufacturing environments and smart factories. It can both serve as an automated logistics carrier (loading capacity: up to 200 kg) and as a platform for additional devices such as robots, for example, to be mounted.

The 3D-printed platform has a fully integrated design, i.e. any bearings or electronics can be integrated during the printing process. Two key elements are special 3D-printed omni wheels with two different materials, allowing the platform to move sideways, and an integrated safety feature (human detection antenna), which was also 3D-printed.

For more information on BigRep's debut of new products and technologies, please visit its *formnext* booth (hall 3.1 / E-20, Nov. 13-16) or visit www.BigRep.com/nextgen.

About BigRep

BigRep develops the world's largest serial production 3D printers, creating the industry benchmark for large-scale printing with the aim to reshape manufacturing. Its award-winning, German-engineered machines are establishing new standards in speed, reliability and efficiency. BigRep's printers are the preferred choice of engineers, designers and manufacturers at leading companies in the industrial, automotive and aerospace sectors.

Through collaborations with its strategic partners – including Bosch Rexroth, Etihad Airways and Deutsche Bahn – and key investors – including BASF, Koehler, Klöckner and Körber – BigRep continues to develop complete solutions for integrated additive manufacturing systems, as well as a wide range of printing materials on an open-choice source. Founded in 2014, BigRep is headquartered in Berlin with offices in Boston and Singapore. Leading the way in one of the world's key technologies, our multinational engineering teams are highly trained, interdisciplinary and customer-focused.

For additional information, please contact:

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