

Media Information
13 November 2018

A million printed components in just ten years: BMW Group makes increasing use of 3D printing

- BMW Group is a driver of additive manufacturing
- Use of additive manufacturing is increasing in series production

Munich. At the BMW Group, the use of 3D-printed components is on the rise. Over the last decade alone, the company produced a million parts by this innovative method, and this year output from the BMW Group Additive Manufacturing Center is expected to reach over 200,000 components — a 42 percent increase on last year's total.

Dr. Jens Ertel, Director of the BMW Group Additive Manufacturing Center: “The use of components made by additive manufacturing in series production of vehicles is increasing particularly strongly at the moment. We are following the development and application of advanced these manufacturing methods very closely indeed, partly through longstanding cooperations with leading manufacturers in the field. At the same time, we are engaging in targeted technology scouting and evaluating innovative production systems.”

Recently the BMW Group fitted its one-millionth 3D-printed component in series production: a window guide rail for the BMW i8 Roadster. Thanks to the work of specialists at the Additive Manufacturing Center, the rail took just five days to develop and was integrated into series production in Leipzig shortly after. It is found in the door of the BMW i8 Roadster and allows the window to operate smoothly. The component is manufactured by HP Multi Jet Fusion Technology, a high-speed method enhanced by the BMW Group in conjunction with HP and now in use in the series production of vehicles for the very first time. It can produce up to 100 window guide rails in 24 hours.

BMW i8 Roadster now incorporates two additively manufactured components

The window guide rail is the second 3D-printed component in the BMW i8 Roadster. The first was the fixture for the soft-top attachment, which is also produced at the Additive Manufacturing Center in Munich. Made of aluminium alloy, the metal component weighs less than the injection-moulded plastic part that is normally used but is still considerably

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stiffer. Its importance has already been recognised with an Altair Enlighten Award in the category for Modules this year. The accolade honours lightweight innovations in the field of subsystems and components.

Additive manufacturing fulfils customers' wishes

Meanwhile, the personalisation of vehicles and components by customers themselves is also becoming more and more important. With the MINI Yours Customised product initiative, customers can design selected components themselves, such as indicator inlays and dashboard trim strips. They create their designs at the online shop (www.yours-customised.mini), and the parts are then 3D-printed to specification.

Advanced and customer-focused in equal measure, MINI Yours Customised was honoured with a special accolade: the gold German Innovation Award presented by a foundation called the German Design Council ('Rat für Formgebung').

The BMW Group is constantly exploring ways of using additive manufacturing to the customer's advantage.

Additive manufacturing for series production

For the BMW Group, additive manufacturing will be a key future production method. The company first began using plastic and metal-based processes back in 2010, initially for the production of smaller series of components, such as the water pump pulley for DTM vehicles. Further series applications followed in 2012, with various laser-sintered parts for the Rolls-Royce Phantom. Since last year, the fixtures for fibre optic guides in the Rolls-Royce Dawn have also been 3D-printed, and the luxury brand today incorporates a total of ten 3D-printed components into its products.

The BMW Group has been quick to capitalise on its experience, identifying potential uses for additive manufacturing technologies early on.

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* BMW i8 Roadster fuel consumption and emissions data:

Combined fuel consumption 2.1 l/100 km; confined electricity consumption 14.5 kWh/100 km; combined CO2 emissions 46 g/km.

(All figures based on EU test cycle using standard tyres).

Figures shown here for fuel and electricity consumption, CO2 emissions and range were determined according to the European Regulation (EC) 2007/715 in the version applicable at the time of type approval.

The figures refer to a vehicle with basic configuration in Germany. Ranges shown allow for the different wheel and tyre sizes and optional equipment.

Values shown here are already based on the new WLTP test cycle and have been translated back into NEDC-equivalents for purposes of comparability. [For these vehicles, different CO2 values from those cited here may be applied to determine the rate of taxation or other vehicle-related duties.]

CO2 efficiency specifications are determined according to Directive 1999/94/EC and the current Pkw-EnVKV, and use fuel consumption and CO2 values identified in the NEDC cycle for classification purposes.

For more information on official fuel consumption figures and specific CO2 emission values of new passenger cars, please see the "Leitfaden über Kraftstoffverbrauch, die CO2-Emissionen und den Stromverbrauch neuer Personenkraftwagen" (Guideline for fuel consumption, CO2 emissions and electric power consumption of new passenger cars), which is available free of charge from all dealerships and at

<https://www.dat.de/en/offers/publications/guideline-for-fuel-consumption.html>

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The BMW Group production network

Strong customer demand and the launch of new models resulted in very high capacity utilisation for the BMW Group's production network in 2017. With 2,505,741 vehicles produced for the BMW, MINI and Rolls-Royce brands, production volumes reached a new all-time high. This figure included 2,123,947 BMW, 378,486 MINI and 3,308 Rolls-Royce units. The company's German plants, which produced more than one million vehicles, are responsible for roughly half of production volumes.

With its unparalleled flexibility, the leading-edge production system is in excellent shape for the future. Based on Strategy NUMBER ONE > NEXT, it is characterised by a high level of efficiency and robust processes. The BMW Group's production expertise represents a decisive competitive advantage and contributes to the profitability of the company and its sustainable success.

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Quality and speed of reaction are key factors in the BMW production system, as well as flexibility. Digitalisation, standardised modular concepts and intelligent composite construction testify to the high level of expertise within the production network. At the same time, the production system offers a very high level of customisation and allows customer specifications to be modified up until six days before delivery.

The BMW Group

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises 30 production and assembly facilities in 14 countries; the company has a global sales network in more than 140 countries.

In 2017, the BMW Group sold over 2,463,500 passenger vehicles and more than 164,000 motorcycles worldwide. The profit before tax in the financial year 2017 was € 10.655 billion on revenues amounting to € 98.678 billion. As of 31 December 2017, the BMW Group had a workforce of 129,932 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.

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