Innovations in body design: the multi-material mix of the new Porsche 911

The 911 Cabriolet has a lot to offer: its body features more innovative light-weight components than ever before.

In addition to high-strength steels, more extruded aluminium profiles were also used in the bodyshell, such as for the front and rear longitudinal members, inner and outer door sills and floor reinforcements. Their share has been increased from three to 25 percent. Porsche also uses more die-cast aluminium parts in the new 911, for instance as part of the front spring strut mount, rear tunnel housing, rear longitudinal members and impact absorber mounts. The benefit of die-casting is that even complex, geometrical
components can be produced as one single component. Reinforcements or screw connections no longer have to be produced and welded individually. As a result, the component not only becomes lighter, but production steps also become obsolete, making production more efficient.

Up to now, one disadvantage of aluminium die-cast parts had been the necessary thermal treatment following die-casting. This step is required to lend components the desired material properties that are crucial for crash performance, for example. Thermal treatment therefore represented a separate and thus energy and time-consuming step in the production process. In the new 911, Porsche now utilises the temperatures generated during painting processes to perform final treatment of die-cast parts.

![Image of Porsche 911](image_url)

Materials and production processes define the ideal connection technology: welding, bonding, clinching, screw connections – no less than ten methods are involved in assembling the body of a new 911. One new feature, for example, is friction welding with countersunk head bolts to link components made of aluminium and steel. In this process, the steel bolt is pressed through the aluminium at such a high speed that friction causes the countersunk head bolts to merge with the steel component, creating a particularly strong connection.

The body of the new 911 consists of a multi-material mix and is thus taking the next big step in intelligent light-weight design, advancing the weight reduction strategy started by the predecessor model. At the same time, the evolved body concept also guarantees higher rigidity. Compared with the predecessor model, the 911 Coupé delivers better torsion and bending values. As a result, the 911 stays unwaveringly on course even when driven with a sporty driving style on sections of road with different surfaces.
Hermann-Josef Stappen

hermann-josef.stappen@porsche.de

Link Collection

Link to this article

Media Package
Downloads
Innovations in body design of the new 911, infographics, 2019, Porsche AG