

911 CARRERA MODELS: Fuel consumption combined
11.7–8.2 l/100 km; CO₂ emissions 275–194 g/km



Electromagnetic Compatibility – a Product Development Issue

___ At its site in Bietigheim-Bissingen, Porsche Engineering has its own center for electromagnetic compatibility (EMC Center), which provides diverse options for EMC-oriented developments. Beyond the automotive sector, tests are performed for customers from different areas such as industrial, medical, and household technology.

By Jan Spindler, Ralf Fanz, Florian Dietze Photos by Jörg Eberl

Due to the rising number of electronic components and radio communication services in everyday life, electromagnetic compatibility (EMC) has become significantly more important in the last few years. For electronic systems, there are legal and customer-specific requirements to ensure that, first, they do not interfere excessively with their electromagnetic environment, and second, that they are resistant to interference from other systems and installations. Depending on the application environment and the customer, threshold values must be fulfilled with regard to interference emissions and requirements for the checking level for interference input.

Seeing EMC as a strength

The acceptance test is a criterion for release onto the market. To ensure that a product is launched onto the market punctually and without any problems, the corresponding requirements and criteria should be considered from the beginning of the development process. This is to avoid time-consuming rectifications and verification tests, and it can also provide competitive advantages. When problems are only identified in later stages of the development process, it is difficult to implement changes. >



EMC vehicle measurement

One of the everyday measurement procedures is the interference emission vehicle measurement. From the Porsche Communication Management to the GPS antenna and the TV module, everything is looked at closely. For this, Porsche Engineering uses two state-of-the-art measuring stations. The roller dynamometer can be used to perform tests at speeds of up to 50 km/h.



An interference emission measurement is performed in the anechoic chamber

Ideally, EMC disturbances can be reduced by means of shielding measures and filters. If these measures are not effective, redesigns are required. The comprehensive adjustments and additional measurements lead to costs that were not factored in, and experience shows that these increase exponentially the later an EMC problem is discovered.

Integration into the development process

In the development process, the focus is usually on functionality. At the start of the development it is often not clear which requirements apply to the target market and

what scope must be fulfilled. However, the EMC topic should be considered from the beginning. Aside from the applicable threshold values, basic aspects can be considered. These include the PCB layout and structure, the selection of the components, and a comprehensive grounding concept. Intensive preparation can often reveal shortcomings in this early phase. The scope, the applicable standards, threshold values, and requirements should be defined as early as possible. Ideally, these are set down in the form of a specification set or a catalog of requirements. In the long term, the knowledge gained over time is employed in various projects and can ultimately contribute to all-round improvement.

Porsche Engineering as a development partner

The Porsche Engineering EMC Center has already proved itself a reliable and flexible partner in a multitude of projects. The goal of the center is to discover and document problems and then develop the corresponding measures for

The distinguishing feature is the long-term support for customer projects.

optimization or resolution. The approaches used here in disruptor analysis do not have to adhere to a standard. To find interference sources and detect switching paths, mea-

suring equipment is sometimes used that has been modified by Porsche engineers to meet their own individual requirements. Additionally, special constructions can be used for application-relevant scopes. The comprehensive repertoire of interference-suppressing materials can be used for a wide range of approaches, the effect of which can be tested immediately in the anechoic chamber.

The Porsche Engineering EMC Center can perform classic layout consulting, provide a review relating to the test plan, or provide support to clients building up their own EMC expertise.

For the employees at the EMC Center, individual consulting with customers and fast, solution-oriented processing of projects are the focus of their day-to-day work. What distinguishes the EMC Center in Bietigheim-Bissingen is the long-term support for customer projects. From the initial idea to the qualification and series production—the entire spectrum can be provided by a single source. ■

The new generation of the 911 Carrera Cabriolet is tested on the roller dynamometer



An engineer evaluates measurement results

