

**INNOVATIVE TECHNOLOGIES**

Lightweight Solutions  
Made of Plastic



# Innovative Material.

## From a Technical Plastic to an "Ultra Lightweight Construction"

In the last years, the automotive industry has shown an increasing interest in lightweight construction because it can make a significant contribution to CO2 reduction. High-quality plastic is the perfect material to realize both functional lightweight constructions as well as lightweight constructions for design purposes. The freedom when designing with plastic enables the excellent integration of functionality and, at the same time, reduces the number of components. In addition, plastic is a very environmentally-friendly material, which can be completely recycled.

As a "Full Service Supplier", BOGE Rubber & Plastics can offer you this lightweight concept. When it comes to plastic injection molding, we can support you in the automotive industry as well as in other industries as a competent developing partner from the initial concept to serial production. BOGE Rubber & Plastics is an internationally active group of companies and has uniformly defined processes throughout the companies. This way we can guarantee consistent standards worldwide.

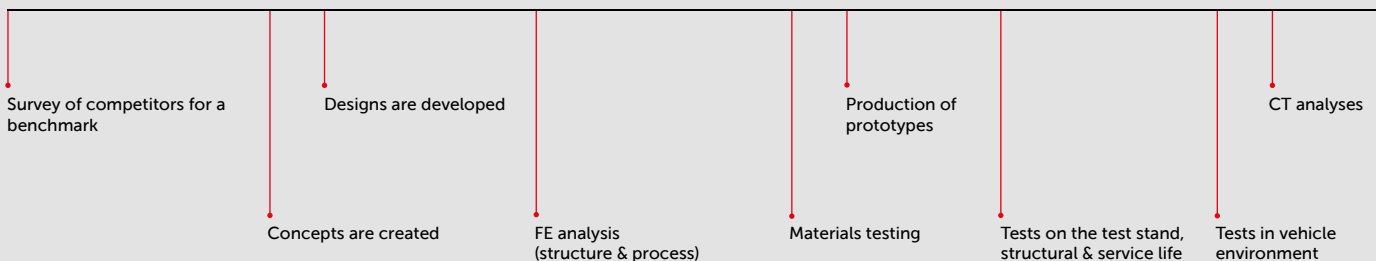
## Our Strengths

- Short development time
- Own tool manufacturing
- Modern testing and simulation facilities
- Comprehensive quality management in accordance with ISO/TS 16949

As a system supplier, we develop, manage and produce complex and high-quality plastic products, as well as modular systems for our customers worldwide. Our internal team of developers go hand in hand with our own tool manufacturing to realize plastic components of the highest quality and with the greatest punctuality. Innovations with new materials regarding the topic of ultra lightweight construction with continuous glass fiber technology complete our performance range.

Test our performance - we are looking forward to your lightweight construction projects!

## Our Development Process:



# Lightweight Makes the Difference.

## Ultra Lightweight Construction

Plastics which are reinforced with continuous glass fiber provide important potentials for lightweight construction and contribute to the reduction of the fleet's consumption. These materials are plastics which incorporate textiles made from glass fiber, carbon fibers or aramid fibers.

This material which was originally used in aerospace is now increasingly being used in automotive construction.

The following material characteristics speak for themselves:

- High stiffness and strength
- Can be recycled completely
- 100% corrosion-resistant
- Weldability

Formerly, the commercial use in large series was prevented by the long process chains and the resulting automation which was very complex. The example of a safety-relevant component demonstrates how BOGE Rubber & Plastics realized a fully-automated process chain: We manufacture brake pedals made from plastic granules and pre-consolidated, textile, semi-finished products (organo sheets). In serial production we can thus achieve weight savings of 40%-55% compared to conventional pedals.

BOGE Rubber & Plastics is tackling the challenge of analyzing the material class of continuous fibers and developing stable processes for serial production. Therefore, we are the link between current process research and its successful implementation in serial production.

## OUR DEVELOPMENT FOCUS IS ON THE FOLLOWING APPLICATIONS:

### Driver Control Systems and Powertrain



#### Pedal Modules

- Significant weight reduction
- Multi-functional design
- Development and testing from one source



#### Gearshift Components

- Innovative precision injection molding using 2- and 3-component technology
- High manufacturing precision
- Weight optimizations



#### Powertrain Suspension Mounts

- Direct integration of the rubber unit mounts from one source
- High component rigidity thanks to the use of innovative plastic materials
- NVH- and crash optimizations

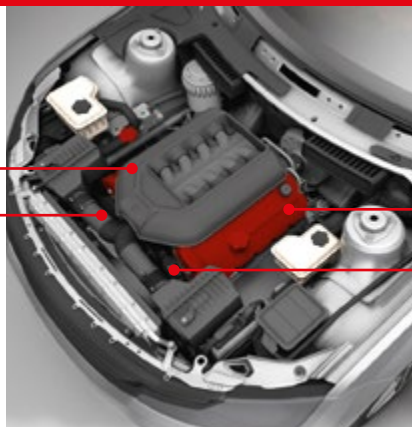
### Engine Compartment

#### Visual Components

- Design Cover
- Battery Cover

#### Air-Intake Components

- Air Intake Scoop
- Charge Air Tube
- Intake Manifold
- Air Pressure Tube



#### Functional Components

- Toothed Belt Cover
- Chain Guide/Guide Rail
- Cylinder Head Cover
- Battery Tray
- Brackets

#### Oil-Bearing Components

- Engine Oil Pan
- Suction Filter
- Transmission Oil Pan

# Innovative. International. Experienced.

Top NVH and lightweight products for the automotive industry – that is what BOGE Rubber & Plastics stands for all over the world. As a longstanding partner of international OEMs, we develop innovative solutions for the markets of tomorrow.

## BOGE Rubber & Plastics at a Glance:

- Leading international player in the field of rubber-metal and plastics technology
- Established development partner of the global OEMs
- More than 80 years of experience in the automotive industry
- Innovations and complete solutions that set new standards in vibration control technology and lightweight construction
- Unrivalled dedication to service and customer support
- Global operation with ten locations and around 4,200 employees on four continents

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