

## Dynamic driving experience

GF ensures comfort and safety in vehicles thanks to its trend-setting materials

What has to happen if a material that has been known for decades but is basically unchanged needs to be reworked to meet demanding new applications in the automotive industry? The answer: You have to leave the beaten track and explore new avenues. This is what GF Automotive has done with the well-known material cast iron. The result is known as Sibodur. And in a few years' time, GF expects to deliver some 50 parts made from this family of materials to international car manufacturers.



The new material's name reflects its "ingredients" and its properties. The name Sibodur is derived from the silicon, boron it incorporates and from the material's extreme durability achieved through a special manufacturing formula. The innovative material, used to date in the German plants of GF Automotive in Singen and Mettmann, reconciles what is actually irreconcilable: hardness and ductility. It is thus predestined for use in passenger vehicles where the dynamic properties in chassis parts are particularly crucial.

### **Flying in the face of received wisdom**

The hardness of cast iron can be increased, as engineers have long known, by creating graphite precipitates in the form of spheroidal particles rather than flakes. Unfortunately, this also makes the material brittle. This problem can be dealt with by adding silicon, which makes the cast iron more ductile, but at the cost of castability.

Werner Menk, head of Materials Development at GF Automotive, and his team simply ignored these well-known properties and even raised the material's silicon content considerably. "It's a little like adding more butter when you're baking a cake", says Werner Menk, explaining the idea behind adding silicon and the greater ductility this produces in the material. The problem of castability was solved by adding boron, which helps the material solidify when it cools down. The task is not an easy one, since GF Automotive produces millions of vehicle parts every year, and each one of them has to be manufactured with the utmost precision to narrow tolerances and must be absolutely reliable.

### **A more dynamic driving experience**

Owing to the hardness of Sibodur, chassis parts can be made slimmer than those manufactured with aluminium. This relieves some of the concerns that automotive developers have when faced with the limited space available. And the new material has benefits for the end customer too. Its hardness provides security, and its ductility means it is dynamic, ensuring a comfortable driving experience.

### **Worldwide patent**

Sibodur is the future. For instance, for its Golf platform, the Volkswagen Group is already having the transverse link – which used to be forged – made of Sibodur and built into the various models of its VW, Audi, Seat and Skoda brands. And in a few years' time, GF Automotive expects to be delivering some 50 parts from the Sibodur family of materials to the automotive industry. Thanks to patents valid worldwide, the competitive edge in cast iron chassis parts that Sibodur gives GF Automotive is safeguarded for years to come.

## The bottom line

# Breaking new ground

“The key to success for my team and me is flying in the face of received wisdom and breaking new ground with a clear goal in front of us”.

*Werner Menk, Head of Materials Development at GF Automotive, Schaffhausen, Switzerland*

## The market

# SiboDur already in use

### Europe's biggest manufacturer opts for Sibodur

Volkswagen, Europe's biggest carmaker, has already opted for the new material. The Wolfsburg-based manufacturer is using Sibodur in its Golf platform and vehicles of the VW, Audi, Skoda and Seat brands.

### Full innovation pipeline

GF Automotive has other cards up its sleeve, for instance the material known as SiMo 1000, which boasts outstanding properties at high temperatures and is opening up new applications for the Corporate Group.

## Materials in a duel

# The customer is the winner

**Cast iron versus aluminium** Both materials are very much in demand especially in the automotive industry. The advantages of cast iron – greater strength, less volume, good castability and relatively low costs – stack up against those of aluminium, which is lighter, easier to machine and needs no corrosion protection.

### Neck-and-neck race

For a long time it seemed as though aluminium was in the lead until Georg Fischer Automotive gave cast iron “a shot in the arm” with its Sibodur family of materials. Now the race is neck-and-neck again, and the customers of GF Automotive, which uses both materials in different processes and applications, get the best possible solution for their individual needs.

## «Adding Quality to People's Lives»

# Comfort and safety in the car

### Relaxed even after long journeys

Modern chassis provide a comfortable journey despite very high speeds because even poor roads are barely noticed in the passenger compartment. The very hard cast iron material Sibodur deserves some of the credit. For instance when used in a car's steering knuckles, which have to withstand a lot of stress.

### Safety and long life

Sibodur ensures not only comfort in driving but also significantly greater safety. For one thing, because the material itself is highly resistant. For another, because the developers have more space for additional safety options since parts made of Sibodur are smaller in size. What's more, Sibodur's hardness ensures a particularly long life.