

# No electric car without plastic

Engineering plastics and  
polyurethanes in the BMW i3



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1

## Seat backrest in the driver and passenger seats

The seat backrest in the driver and passenger seats is the first injection molded and uncoated structural component made from polyamide (PA) to have a visible surface and to be used in the vehicle interior. This lightweight hybrid component, weighing only 2 kg, embodies all the know-how of BASF's Global Seat Competence Team.

### Material:

Ultramid® B3ZG8 UV (PA)

### Properties:

- High UV-stability
- Very good scratch resistance
- Excellent surface quality
- Sufficient rigidity
- Good elongation and toughness from -30°C to +80°C
- Low emission
- Use of simulation tool Ultrasim®: accompanied all the required certificates at different seat positions, temperatures and loads

The seat backrest owes its final, complex and above all very slim shape to the early use of BASF's universal simulation tool **Ultrasim®**. Thanks to the precise numerical simulation of the materials used for the backrest, release lever and belt guide, the calculated behavior in the crash simulation matched the subsequent tests very accurately.



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**2**

## Structural component in the carbon fiber body

The BMW i3 carbon body contains PBT (polybutylene terephthalate) structural parts between the inner and outer shell. The largest component and the first of its kind is a so-called **integral component** located in the rear side area between the carbon fiber body shells. Apart from its load-bearing function in the event of a crash, it also serves to keep the two body shells apart and forms the rear opening for the side window.

### Material:

Ultradur® B4040 G6 (PBT)

### Properties:

- High dimensional stability irrespective of surrounding climate conditions
- Necessary buckling resistance
- Use of simulation tool **Ultrasim®**: low-warpage production and glass fiber orientation for occurring loads achieved

The integral component comprises several smaller parts thus reducing complexity and costs. More than two dozen smaller Ultradur® components with a combined weight of around nine kilograms are integrated in other areas of the vehicle's body where they provide reinforcement and achieve the desired **acoustics**.

**3**

## Rear seat shell

Within the self-supporting rear seat shell, carbon fibers are combined with a polyurethane matrix for the first time in a serial production vehicle. The component integrates a variety of functions such as the cupholder attachment and storage tray, saving on both assembly work and weight.

### Material:

Elastolit® (PU)

### Properties:

- Wide process window
- High fatigue strength
- Very good damage tolerance

The crash-relevant part meets the stringent safety requirements by the BMW Group despite its wall thickness of just 1.4 millimeters.



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## Versatile BASF plastics and construction know-how in the BMW i3

By bringing together all plastics expertise in one division, BASF can offer **customized solutions** to innovative customers and their suppliers **worldwide** as well as support them during component construction. For several innovative components in the BMW i3, the electric vehicle from the BMW Group, BASF supplies versatile plastics and supported part development with extensive construction know-how. Furthermore, the BMW i3 incorporates many other parts made of BASF plastics which have already been established in a number of vehicles.

### Innovations in the BMW i3

- New seat structure in the backrests of the front seats made of Ultramid® (PA)
- Multifunctional reinforcement in the carbon fiber body made of Ultradur® (PBT)
- Self-supporting rear seat shell made of Elastolit® (PU)



### Established problem solvers for interior and exterior

- Structural rigidity: reinforcement of the roof frame made of Elastolit® D (PU)
- Automotive electronics: electric and electronic parts made of engineering plastics and cable elements made of polyurethane
- Interior acoustics: Elastoflex® E foams in the roof construction
- Module production: glass encapsulation system Elastolit® R for the optional sliding roof
- Axle suspension: lightweight spring aids made of the special elastomer Cellasto®
- Design: basecoats in four colors by the BASF Coatings division

Elastolit® D  
Roof frame and  
A-pillar reinforcement

Elastoflex® E  
Instrument panel

Ultramid® B3ZG3  
Fuse box

Cellasto®  
Spring aids for the front and  
back axle suspension

Elastoflex® E  
Roof construction

Elastolit® R 8919  
Glass encapsulation of the  
optional sliding roof

Ultradur® B4040 G6  
Sliding roof frame

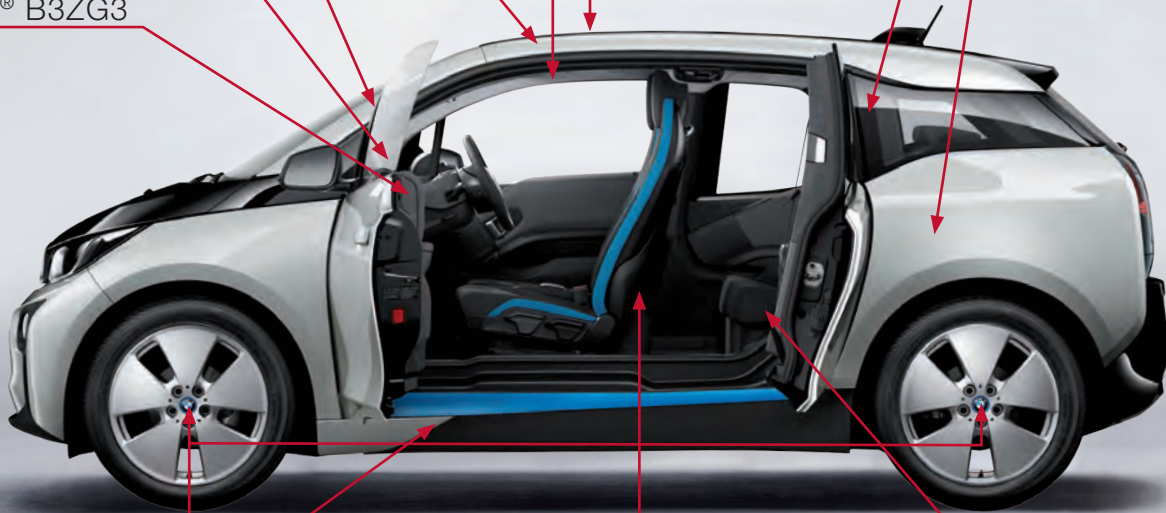
Ultramid® B3ZG3  
C-pillar cover

Ultradur® B4040 G6  
**2** Structural component  
in the carbon fiber body

Ultramid® A3EG6  
High-voltage connector

Ultramid® B3ZG8 UV  
**1** Seat backrest in the driver  
and passenger seats

Elastolit®  
**3** Rear seat shell



## Selected Product Literature:

- Ultramid® – Product Brochure
- Ultramid® – Product Range
- Ultradur® – Product Brochure
- Ultradur® – Product Range
- Engineering Plastics for Automotive Electrics – Products, Applications, Typical Values

### Note

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