

# News Release



*On the occasion of the conference "Plastics in Automotive Engineering"*

## **Pedestrian Protection on a Broad Front**

- Fourth Opel model with bumper stiffener made of a BASF resin
- Ultradid component especially stronger in comparison

In the tracks of the Opel Corsa (2006) and the Opel Insignia (spring of 2009), the Opel Astra has taken to the roads a few months later with a lower bumper stiffener (LBS) made of BASF's plastic Ultradid® CR. And even the new version of the Opel Meriva minivan, which debuted at the Geneva Motor Show in March 2010, has an LBS made of Ultradid. The LBS is a component designed to satisfy the latest legislation regarding pedestrian protection and requires the use of high-performance materials. The polyamide has been optimized specifically for crash applications and already demonstrated its capabilities in various other vehicle components.

While the LBS in the Opel Corsa was something new in terms of pedestrian protection, the Opel Insignia was able to draw on previous experience, making it possible to design an especially lightweight and slim component to fit into the limited space available for installation. The skill of a development engineer is evidenced by being able to take both form and function into consideration simultaneously for each application. The completely different styling concepts of the Opel Astra and Opel Meriva compared to the one of

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the Opel Insignia result in different front end designs for each, so that none of the four LBS components is similar (figure).

### **Off-tested simulation program**

BASF developed all versions of the LBS via computer with the aid of its ULTRASIM™ simulation program. Continuous expansion of this instrument's capabilities has, in the meantime, made it possible to combine and automate exact information about the local characteristics of a component with methods of numerical optimization. What was used for the first time on the Opel Insignia – so-called morphing, i.e. shape optimization during design calculations – is now a standard technology in the BASF program package for such parts. Thanks to the much more accurate predictability, construction of multiple and costly prototypes can be largely dispensed with. Designing demanding plastic components is hardly possible today without such computer programs.

### **PA versus PP for pedestrian protection**

Comparison with a production LBS made of impact-modified polypropylene (PP) from another automaker shows: The LBS for the Opel Insignia made of Ultramid B3WG6 CR is about 50 % lighter than the PP LBS (1 kg compared to 1.6 kg) and 50 % narrower at its widest spot. Additional investigations of both components showed that the Opel LBS exhibits almost three times the stiffness and energy absorption. Considering the cost of the material, an LBS made of Ultramid CR offers the end user a weight advantage of about 66 percent for the same costs and energy absorption. This is important especially where the space available for installation and weight requirements are particularly challenging.

Additional information on Ultramid® (PA) resins:  
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A press photo is available at [www.basf.com/pressphoto-database](http://www.basf.com/pressphoto-database) under the keyword "Plastics" or by entering the search term "Ultramid". This text and the photo will also be available shortly in the Plastics press archive of BASF at: [www.basf.de/plastics/pressreleases](http://www.basf.de/plastics/pressreleases).