

## BASF Polyurethanes: Innovative polyurethane products for automotive OEMs

Based on the principle “We help our customers to be more successful” BASF develops individual tailor-made solutions for its customers and creates its own innovative product applications. In partner-like cooperation with its customers BASF has brought numerous innovations to fruition, both in the shape of new products and through targeted further developments and new applications.



BMW uses Elastoskin in the 5 GT instrument panel

Chemists at BASF Polyurethanes GmbH have developed two custom-made PU systems that allow automotive components manufacturers to create an elegant, luxurious look and exquisite feel within the passenger cockpit. Elastoskin, the in-mould-coating (IMC) spray skin, and Elastollan, the hard-phase-modified aliphatic thermoplastic polyurethane (HPM-TPU). These products meet both aesthetic and haptic requirements of interior component design.

The IMC spray skin is an aromatic isocyanate-based PU system, that feels relatively soft since it is also back-foamed. This is why it can be used whenever good haptic properties in response to pressure are valued, for example, in instrument panels, armrests or inside door panels. In contrast, the HPM-TPU product creates a soft-touch sensation. Parts with Elastollan surfaces are not back-foamed. Moreover, the lightfast TPU avoids the need for off-line coating. Application examples include, door handles, centre console covers and cup holders.

### New generation of spray skin with potential in lightweight construction

The new generation of Elastoskin spray skin weighs up to 20 % less than the standard product introduced three years ago. This weight reduction is achieved by physically expanding the PU system with air. Machine manufacturers Hennecke and KraussMaffei have developed special mixing heads for this particular purpose. The new skins not only contribute to lightweight construction but they are less expensive due to savings in material. The system offers a great deal of design freedom in terms of colour and surface texture for the finished skin. The finished skin surface can hardly be distinguished from leather and its pressure behaviour meets the strictest standards of the automotive industry.

### Making its way into the luxury class

Due to its look and feel Elastoskin is already used by manufacturers of luxury models such as Daimler's S and SLK that have an Elastoskin surface that provides the car's occupants with a highly comfortable surrounding. In 2009, BMW started using IMC spray skin for the instrument panel of its 5 GT, and other models and components will follow. Elastoskin has also been showcased in the instrument panel of the Hyundai i-flow concept car. One of the targets of this concept is to present the wide array of options of the various BASF materials.

### Function as well as looks

A very important issue concerning the safety of vehicle occupants is that the airbag, integrated into the dashboard, has to function reliably under cold conditions. The aromatic PU used in the Elastoskin system continues to exhibit very high flexibility even at low temperatures, and the material has easily passed airbag tests at  $-35^{\circ}\text{C}$ .

### Good results in comparison to the competition

Even though aromatic polyurethanes are not lightfast and consequently require a coating, the relatively low material costs of the PU and of the coating account for the fact that they still compare very favourably to competitive products. The coating not only serves to improve the long-term durability but also plays a significant role for setting the hardness and feel, which ensues from the interplay between the PU formulation, the coating and the back-foaming system. Here, too, the coating can create a harmonious colour and gloss over the entire surface.

Thanks to the high-grade, matt-coated surface in combination with the very soft, expanded aromatic PU, Elastoskin has a very pleasant touch in comparison to TPO skin and the more conventional aliphatic spray skin, while allowing more design freedom than TPO, says BASF. In comparison to PVC slush skin, the Elastoskin spray skin not only demonstrates advantages in terms of touch but also in terms of multicoloured design options and lower energy consumption during production and lower component density. A simple masking technique can be used to cover up individual areas of the component so as to coat them in different colours. Very light-coloured surfaces can be achieved owing to the minimal interaction between the PU skin and the PU semi-rigid foam.

### **Elastollan: Aliphatic TPU with a broad hardness spectrum**

The hard-phase-modified aliphatic HPM-TPU Elastollan has already attracted a lot of interest because of its multifaceted haptic possibilities, ranging from velvety to leather-like. Today, it can offer an even greater array. Improvements achieved in its flow properties as well as the broad spectrum of available Shore hardness mean that there are almost no limits when it comes to component design, in creating grain patterns and to attaining a soft-touch. A special feature of Elastollan is that its feel can be matched to customer specifications by fine-tuning the interaction of the Shore hardness value with the surface design.

The most recent example of Elastollan use is the VW Golf VI centre console cover, which has obtained the European SPE Award last year. In close cooperation with BASF applications engineers and the Austrian machine manufacturer Engel, the automotive supplier Key Plastics from Lennestadt, Germany, was able to develop this complex part within a very short period of time. The cover is made by means of a two-component injection moulding with PC/ABS as the underlying component. The cover surrounds as the storage compartment, ashtray, air-conditioner control element, rolling cover of the cup holder and chrome finish on the gearstick. As mentioned above the UV stability of HPM-TPU eliminates offline coating. The softness of this material also makes it an effective anti-squeaking material, avoiding the need for additional vibration decoupling.

### **Adresse:**

<http://www.gupta-verlag.com/general/news/k-2010/8837/basf-polyurethanes-innovative-polyurethane-products-for-automotive-oems>