

## It's all a matter of perspective



Drivers expect reliability and convenience, and their demands extend even to secondary features such as these. That's why EM Kunststofftechnik uses two robust Ticona polymers to produce crucial functional components of the electrical adjustment mechanism of wing mirrors for GM/Opel. Produced entirely from the polybutylene terephthalate Celanex® PBT, the housing of the mirror adjustment unit protects the sensitive mechanical and electronic components. This meets the standard guidelines for electromagnetic compatibility (EMC). The stiffness, strength

Just a glance in the wing mirror is all it takes: Perfectly adjusted! Or perhaps not. In order to attain the right position, a number of different components mesh together in electrically adjustable mirrors.

and impact strength of this thermoplastic polyester combined with its excellent dimensional stability and low moisture absorption also make it ideally suited for this special application.

A combination of Hostaform® POM and Celanex® PBT is used for the internal functional parts. And no wonder: The optimal sliding friction properties of these two polymers ensure that the adjustment mechanism functions flawlessly. As a result, worms, worm wheels and followers made of the two materials intermesh perfectly – even with large

temperature swings. Regardless of frost or extreme heat, these functional components must withstand the block load imparted by the electrical adjustment system, i.e. when the motor continues to run after the adjustment mechanism reaches the limit of its range.

In Opel's Corsa and Astra models, these robust materials withstand high mechanical stresses such as those caused by repeated retraction of the mirror or severe impact, thereby enabling drivers to keep trailing traffic in clear view at all times.

## Ticona helps smart acceleration

For a quick getaway, vehicles need dynamic acceleration and smooth gearshifts. To ensure that this smart response is not achieved at the expense of the environment, Ticona polymers are being used in electronic accelerator pedals and automatic transmission systems to help strike the right balance between performance and fuel consumption.

With the electronic accelerator pedal from Hella of Lippstadt, Germany, modern engine management starts right from the acceleration stage. The pedal sensor, which electronically transmits the foot movements of the driver to the engine management unit, plays a critical role here. This intelligent technology directly affects fuel supply and fine-tunes engine performance to match requirements, so helping improve comfort and safety. And it also cuts energy consumption and therefore CO<sub>2</sub> emissions at the same time. Three engineering polymers ensure the smooth interaction of the elements of this drive-by-wire system: Celstran® LFRT (pedal plate, housing), Hostaform® POM (sliding elements) and Celanex® PBT (sensor housing).

### Powerful trio

Swedish auto component supplier Kongsberg also relies on this polymer trio. The gear selector and shift control housing for the automatic transmission systems on the Ford Galaxy and S-Max are produced from Celstran® LFRT. This material reduces component weight and noise, while also offering high dimensional stability and stiffness. Hostaform® POM, on the other hand, is the material of choice for the cable unit because of its wear resistance and impact strength. Other, smaller parts of functional elements or electronic components are made of

Hostaform® POM and special Celanex® PBT grades. So Ticona polymers help all components of the automatic gearshift mechanism to operate perfectly together.



Three engineering polymers from Ticona are used to make the electronic accelerator pedal from Hella: Celstran® LFRT, Hostaform® POM, Celanex® PBT.