Ultramid®: Well-suited for the water-injection technique (WIT)

Case Study

The water-injection technique (WIT) can be employed to manufacture complex thermoplastic hollow parts highly efficiently by means of injection molding. The WIT is a refinement of the gas-injection technique or gas-internal pressure technique (GIT), which is already well established on the market. Like the GIT, the water-injection technique removes material from the interior of the component, resulting in a weight reduction, fewer visible sink marks, less warpage, reduced clamping force and greater design freedom.

BASF's product portfolio already contains several standard types that are very well-suited for processing by means of the WIT. One example is Ultramid® A3WGM53 for applications exposed to hot oil. In the course of BASF's research project, however, a plastic has been developed specifically for WIT-processing: The hydrolysis-resistant PA 66 type Ultramid® A3HG6 WIT. This material also meets the requirements for a smooth channel surface with favorable flow properties, it exhibits high resistance to media, it is chemically resistant and prevents leaching. During the development of the material, it was possible to precisely work out the interaction between the chemical structure and the processing properties as well as the characteristic values of the material that are crucial for processing by means of the WIT and for the quality of the WIT components. Building upon this knowledge, the BASF experts studied and optimized other products. In this process, they obtained excellent results for the PA 6 type Ultramid® B3G10 SI (SI=surface improved) as well as for the new polyester (PBT) Ultradur® B 4040 G10 WIT, reinforced with 50 percent fiberglass and modified specifically for the WIT. Both types are suitable for structural components that have to meet high mechanical requirements while also exhibiting an excellent exterior surface.