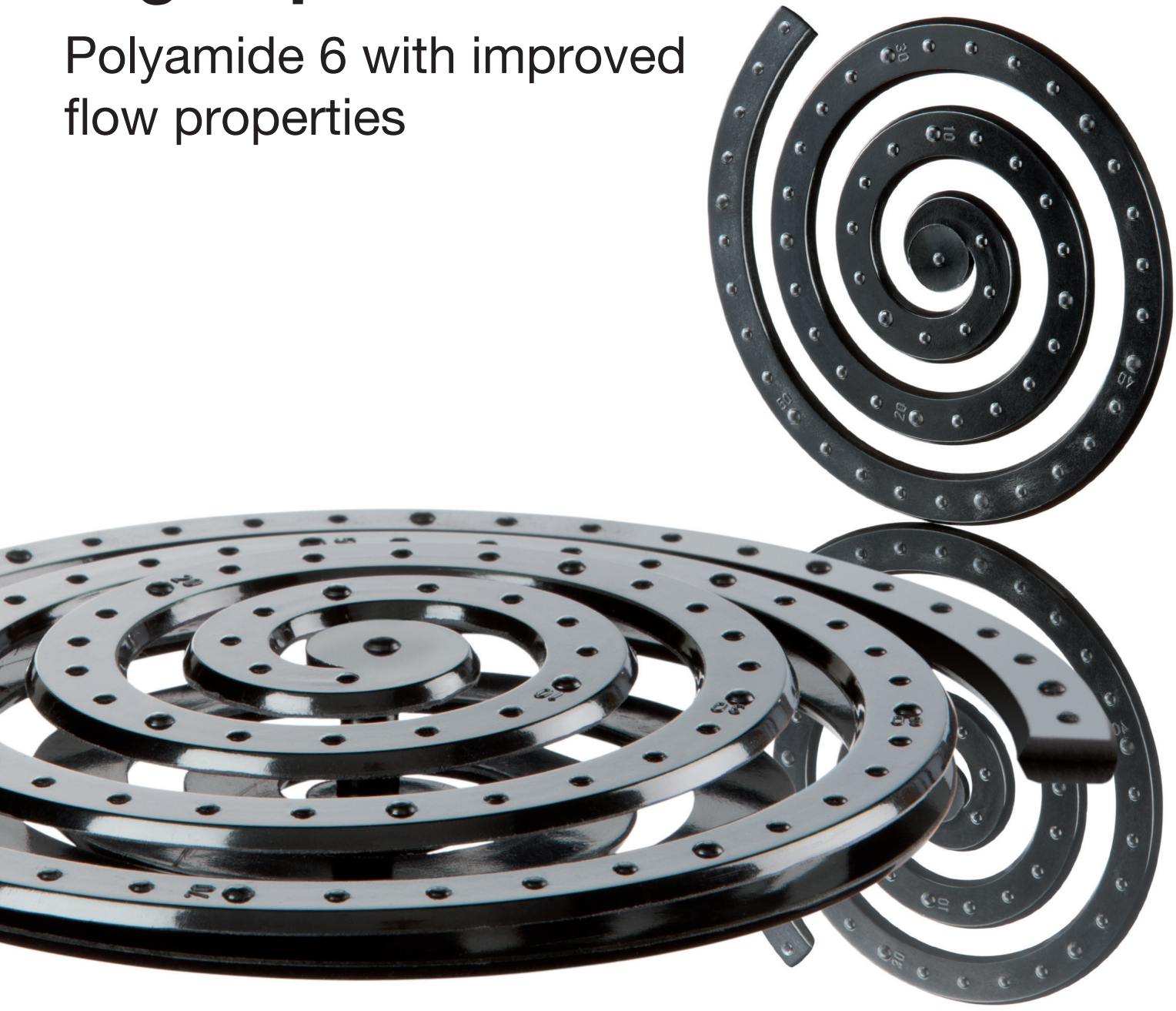
Ultramid® B High Speed

Polyamide 6 with improved flow properties



BASF
The Chemical Company

Ultramid® B High Speed ...

... saves money in injection molding

Improved flowability is always an advantage in processing thermoplastics like Ultramid® B High Speed, with savings in time, money and energy. If all other properties stay alike, an easy-flowing material in injection molding is more sustainable than its conventional, harder flowing counterpart. Easy flow means a lower injection or filling pressure, which in turn reduces the clamping force. So the processor can produce parts on smaller machines. This is a significant added value, since it is a well-known fact that the operating costs of an injection molding machine increase disproportionately with its size.

Better flowability can also mean a reduction in molding temperature. This has two advantages: the cycle time is shorter, productivity rises, and less energy is needed in injection molding.

Because Ultramid® B High Speed has better flow, longer flow paths are basically possible. The mold is easier to construct and has fewer injection points. Therefore, for example, a smaller number of expensive hot runner nozzles is necessary.

Advantages for the processor at a glance:

+ Reduction of the injection pressure
  → Lower clamping force
  → Smaller, cheaper injection molding machine
  → Longer service life of mold because of less wear

+ Lowering of the processing temperature
  → Reduction of cycle time
  → Higher productivity
  → Lower energy consumption of the injection molding machine
  → Savings in energy costs

+ Longer flow paths
  → Simpler gate concepts

+ Easy filling of thin walls
  → Minimum waste with complex geometries

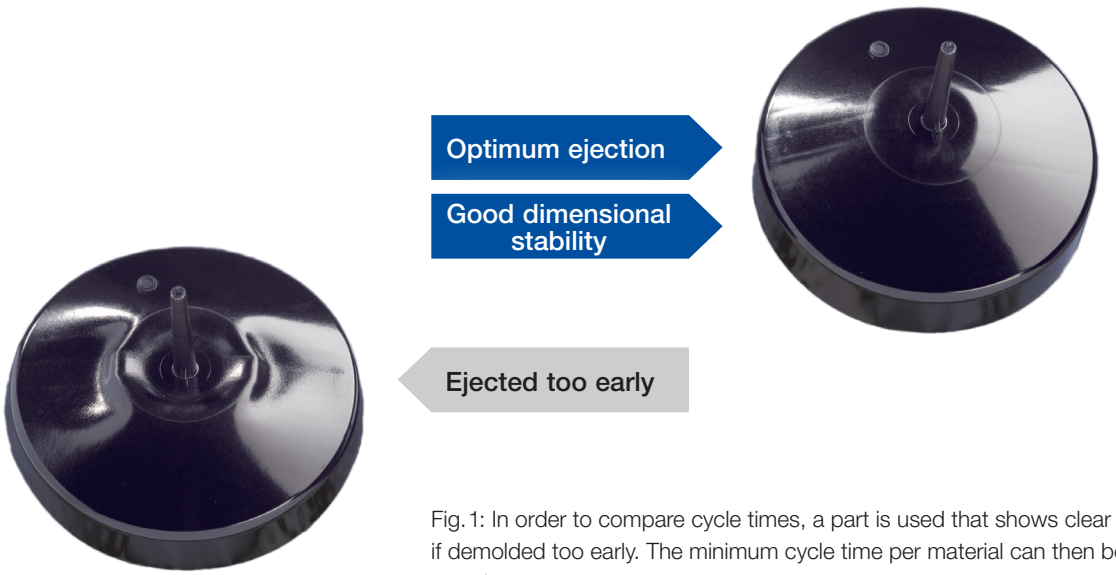


Fig. 1: In order to compare cycle times, a part is used that shows clear deformation, if demolded too early. The minimum cycle time per material can then be determined exactly.

Ultramid® B High Speed

Product portfolio

Ultramid® B3WG6 High Speed	PA6 30 % GF	▪ heat-stabilized for operating temperatures of up to ~170 °C
Ultramid® B3WG7 High Speed	PA6 35 % GF	
Ultramid® B3WG8 High Speed	PA6 40 % GF	
Ultramid® B3EG6 High Speed	PA6 30 % GF	▪ heat-stabilized for operating temperatures of up to ~150 °C ▪ light colors possible ▪ very good electrical properties
Ultramid® B3EG10 High Speed	PA6 50 % GF	
Ultramid® B3ZG6 High Speed	PA6 30 % GF	▪ impact-modified
Ultramid® B3GK24 High Speed	PA6 10 % GF + 20 % GK	▪ low warpage

High stiffness and toughness, good surface, short cycle time: an ax handle made of Ultramid® B3ZG6 High Speed

... increases flexibility in injection molding

The improved flow properties can be used to produce parts at lower processing temperatures than with a standard material and so save energy and increase productivity. The flow properties of the High Speed version are significantly better compared with a standard PA6 with a glass fiber content of 30 %. As Figure 2 shows, Ultramid® B High Speed achieves the same flow properties as the standard material even at a 40 °C lower processing temperature. This in turn means that the processor can manufacture parts at lower temperatures, the cooling time to demolding drops and the cycle time is reduced.

A BASF test shows that parts made from the easy-flowing Ultramid® B High Speed achieve the demolding temperature more rapidly at lower processing temperatures so that they can be taken from the mold earlier. This means an approximately 30 % shorter cycle (Fig. 3).

The overall energy demand of an injection molding process depends on a number of parameters, such as the size and geometry of the part and the machine parameters. The figures for energy consumption are different for each process. The heating energy, however, accounts for the majority, particularly in electrically driven machines. If the processor employs a free-flowing material, he can use a lower temperature and demold the part earlier – a double advantage. This both saves energy and also increases productivity. This advantage in energy efficiency yields results particularly where there are no finishing processes that set a limit to a higher cycle speed (Fig. 4).

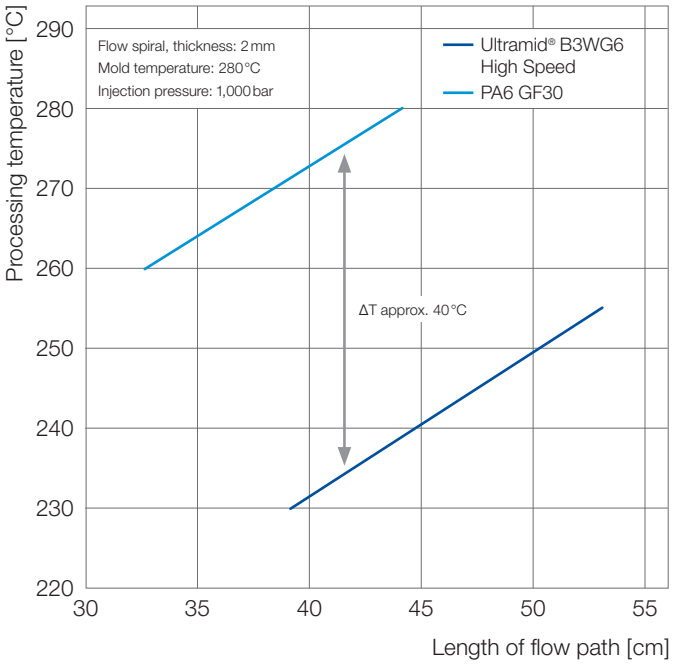


Fig. 2: The clear improvement in the flow properties of Ultramid® B High Speed can be seen in the length of the flow spiral. In order to achieve a comparable flow length, the processing temperature with Ultramid® B High Speed can be reduced by approximately 40 °C compared with standard PA6 GF30.

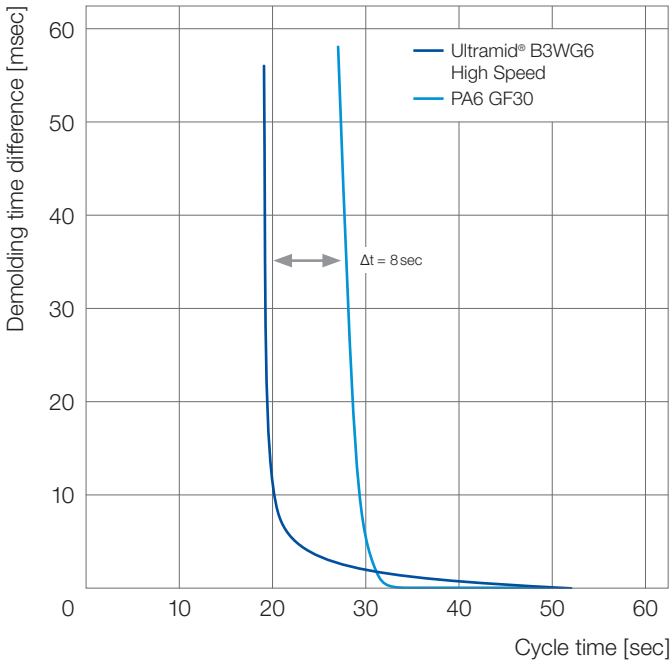


Fig. 3: The demolding time difference is a measure of the deformation of the part in Figure 1. Ultramid® B3WG6 High Speed can be demolded in an approximately 30 % shorter cycle time than a standard polyamide because of the lower processing temperature.

... improves energy efficiency in injection molding

Many components in the engine compartment, such as engine covers and intake manifolds, are made of PA6 and benefit from the flowability of the High Speed products. Other mechanical properties of the new material, such as stiffness and strength, also achieve values similar to the standard material. The particular properties include very good surface quality and good resistance to heat aging (Fig. 5).

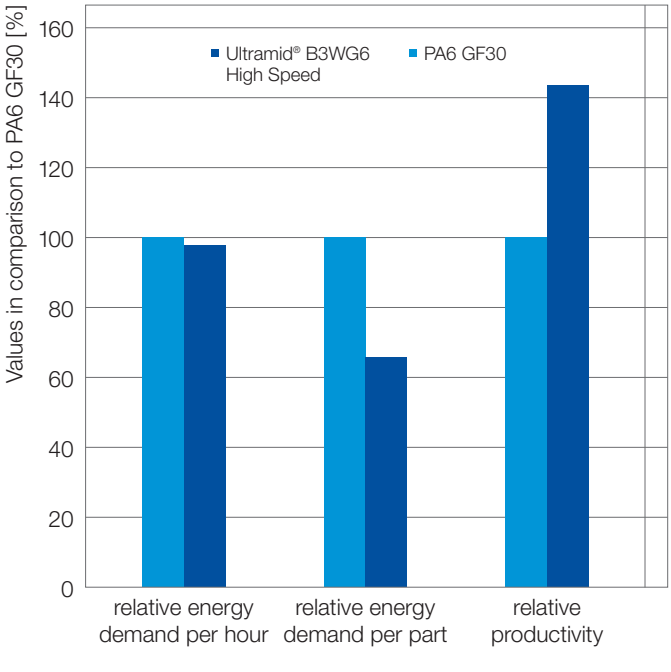


Fig. 4: Relative capacity demand of an injection molding machine when manufacturing test samples made of PA6 GF30 and Ultramid® B3WG6 High Speed. The use of Ultramid® B High Speed improves energy efficiency in injection molding. The energy demand per hour drops because a lower processing temperature can be used. The energy demand per part drops by approximately 30 % because of the shorter cycle time; the number of parts that can be produced rises.

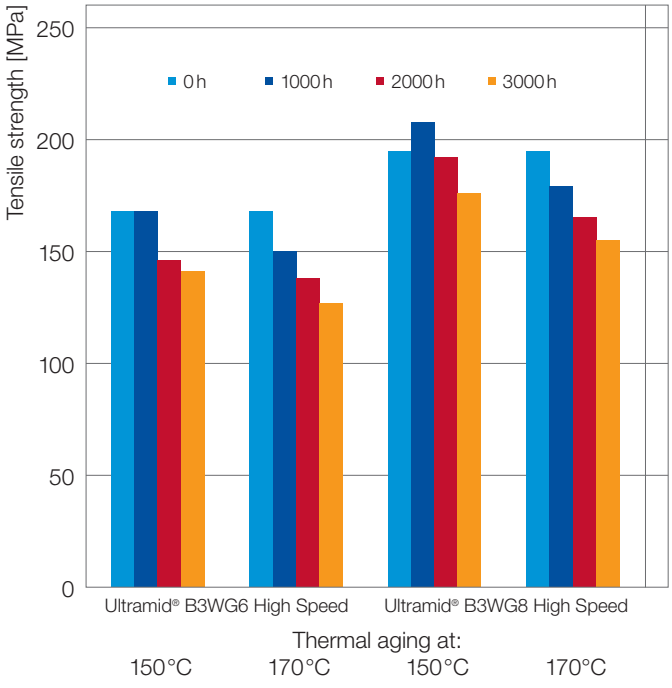


Fig. 5: Ultramid® B3W High Speed is heat-stabilized for applications in the engine compartment.

Selected Product Literature for Ultramid®:

- Ultramid® – Product Brochure
- Ultramid® – Product Range
- Ultramid®, Ultradur® and Ultraform® – Resistance to Chemicals

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. (May 2013)

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