

## Saving energy in the production process with additive masterbatch

*GRAFE improves numerous properties of plastics through in-house development and significantly reduces energy consumption*

Highly effective additive masterbatches from GRAFE, Blankenhain, offer significant energy-saving potential in series production thanks to the specially developed processing aids. In times of rapidly rising electricity and gas prices, they thus contribute to more efficient plastics production. The masterbatch influences the flow behaviour of polymers in such a way that, depending on the application and component geometry, different increases in efficiency can be achieved at lower cost compared to special plastics.

"Our processing aids for cycle-optimised injection can be used with the right masterbatch carrier for a wide variety of high-performance polymers and engineering plastics, including ABS, PA, PBT, PET, PPA, PSU, POM, EPS, PPE, PPS and PSU," says Danny Ludwig, Head of Product Management Color & Functional Masterbatches at GRAFE. In addition, the additive masterbatches are also available in the form of combi-batches with a colour component, explains the expert, referring to numerous applications in the automotive sector.

According to Ludwig, large exterior components such as bumpers and carrier components have already been realised. The expert cites a project example in which the cycle time for a connector made of PBT could be reduced by 40% with a 3% masterbatch dosage. "For parts of the powertrain or parts under the bonnet made of PPA, we were able to reduce the cycle time by 26% with a 4% masterbatch dosage," he explains and adds: "The use of our additive batch enables a more stable processing window of PPA, improves the melt flow and generates easier mould filling in injection moulding applications."

PPA in particular can be processed at lower temperatures and with reduced injection pressure on the injection moulding machine. "Overall, lower friction forces have an effect, which means that burns or damage to critical geometries can be avoided and more complex elements can be realised," Ludwig explains. The surface quality of the components is also improved and demoulding is made easier, he adds. "Overall, a significant reduction in cycle time can be achieved." Depending on the plastic, the dosage of the additive masterbatch is between one and four percent, depending on the task and the problem to be eliminated, he explains.

It is precisely the lower processing temperatures that result in a high energy-saving potential. For example, a customer from the packaging industry succeeded in reducing the cylinder temperature in all zones by 40°C with GRAFE, thus decreasing their energy requirements by 30%. In addition, the optimised flow behaviour at low temperature resulted in a 12% better cycle time, as the parts cooled down faster and more evenly. The entire process chain benefits from the GRAFE processing aid through energy savings in the melting process, higher output in the same time and lower scrap.

Ludwig refers to another customer example from the construction sector that illustrates the savings effect: A "simple" black batch was replaced by a black with GRAFE's additive. "After a holistic efficiency evaluation in the production process, our customer was enthusiastic about the savings potential with the GRAFE additive masterbatch. Despite the fact that the cost of this masterbatch has gone up in price, the total saving far exceeds this and our development is in series production at the customer's site," reports the Head of Product Management Color & Functional Masterbatches.

But that's not all. In addition to better melt flow and reduced cycle times, users of the additive masterbatches also benefit from optimised mechanical properties. Compared to an unmodified base polymer, an improved surface quality, more uniform crystallisation and a faster process on the injection moulding machine can also be achieved, explains Ludwig, which means that GRAFE's processing aids can be used universally when it comes to solving special problems in the processing procedure.

#### About **GRAFE**:

In addition to color and additive masterbatches, **GRAFE's** product range also includes a wide range of functional polymer compounds. One of the sector's largest research and development departments is working on cutting-edge technologies to equip polymers with smart functions. Founded in 1991 by the four Grafe brothers, this family business today has over 300 staff developing and manufacturing products for national and international markets in the company's ultra-modern plant in Blankenhain in Thuringia, central Germany. GRAFE attaches great importance to quality management - and does so with great success, being certified to ISO 9001:2015, IATF 16949:2016 and ISO 50001:2018. Further information: [www.grafe.com](http://www.grafe.com)

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