Smoothing the process

Carefully selected process aids can speed up production, aid dispersion and lift overall compound performance. ***Peter Mapleston*** *investigates some of the latest innovations*

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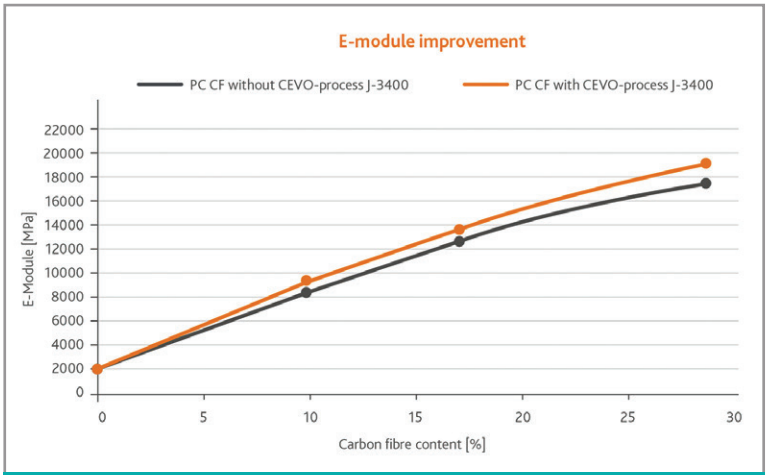

Figure 1: Effect of the inclusion of 0.3phr of CEVO-process J-3400 on tensile (E) modulus of PC reinforced with carbon fibre contents of 9.7, 17.2 and 28.5phr
Source: Völpker Spezialprodukte

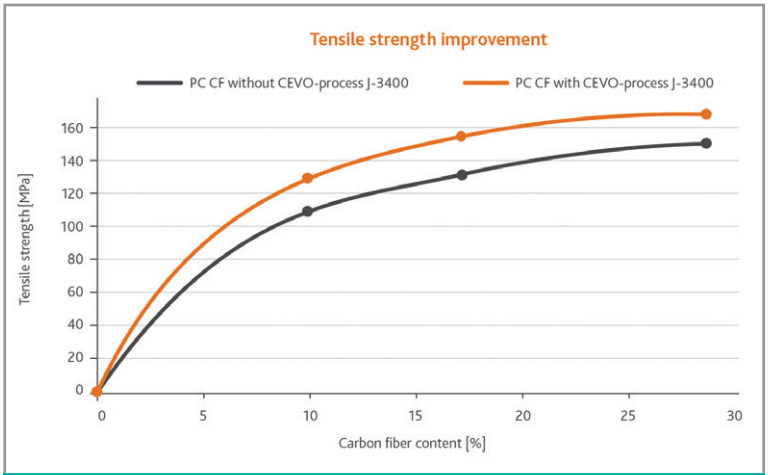

Figure 2: Effect of the inclusion of 0.3phr of CEVO-process J-3400 on tensile strength of PC reinforced with carbon fibre contents of 9.7, 17.2 and 28.5phr
Source: Völpker Spezialprodukte

Whether it's processing of mixed polyolefin post-consumer waste or compounding of high-performance carbon fibre-reinforced polycarbonate, all sorts of plastics formulations can benefit from the judicious addition of processing aids and lubricants to improve processing and performance. With additive developers working continually to adapt their products and to improve effectiveness, this article takes a look at some of the latest developments in the field.

In fibre-reinforced composites, for example, physical performance is influenced by the mechanical properties of the fibre, the dispersion of the fibre within the matrix, and the adhesion between the two phases. **Völpker Spezialprodukte** has been studying how its Cevo-process J-3400 product, a synergistic mixture of montan wax esters and other waxes, can affect the mechanical properties of carbon fibre-reinforced polycarbonate compounds. Tests were carried out using Makrolon 2405, a general purpose, low viscosity, easy release grade from Covestro with an MVR (300°C/1.2 kg) of 19 cm³/10 min. Multi-purpose injection moulded 1A (DIN EN ISO 3167) test specimens were used and the results shown in Figures 1 and 2.

"The study demonstrated that using Cevo-process J-3400 can significantly improve both the tensile modulus and tensile strength," says the company. "Previous studies have already shown that there is a significant correlation between th dispersing effect of this additive on filler materi and the improvement in mechanical properties. The improved carbon fibre distribution allows a reduction in the carbon fibre content and thus leads to lower raw material costs." Cevo-proces J-3400 is available as powder and as compacte dust-free pellets.

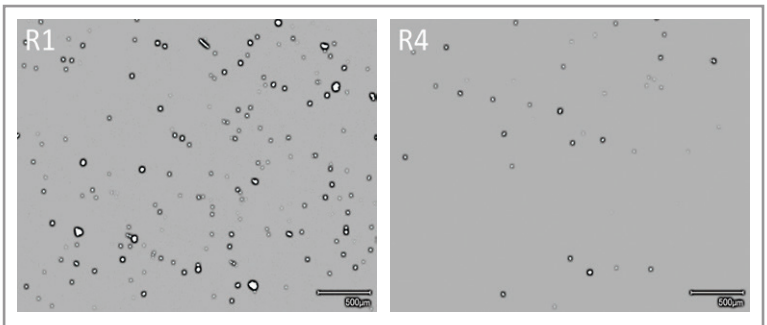

Figure 4: Micrographs show the impact of addition of CEVO-process B-3690 on dispersion of 2% carbon black agglomerates in HDPE. The left image contains no additive; the right image an addition of 0.5%.
Source: Völpker Spezialprodukte

Upcycling polyolefins

Cevo-process B-3690 from **Völpker** is a dispersion additive intended for post-consumer HDPE/LDPE recycling operations. This type of waste often contains unwanted polymer particles and mineral contaminants (among others) that disrupt production and reduce the quality of the recyclate. "Their proper dispersion as well as the dispersion of new fillers such as carbon black is mandatory in order to produce adequate recycling qualities for, for example, injection moulding," says the company.