"Seeing through the Fog"
Kafrit presents new developments in the field of anti-fog coatings

The new product developed for PETG films by Kafrit is a breakthrough that sets the company as a leader on the world scale where solutions for polyester are concerned. The new product is a compound used entirely on the outer layer that faces the packaged material. A layer of only 7 μm in a multilayered structure was sufficient for giving immediate excellent results – without any waiting time. The product was tested in a cold anti-fog test (4° and 0.5°), as well as in a hot anti-fog test (60°) and showed remarkable performance.

Another two solutions are now also being added to the solution inventory of the company – **anti-fog for nylon and for biodegradable polymers (PLA).** Together with the above PETG solution it opens new possibilities to users around the world. The company is inviting customers in the industry to collaborate on using for these advanced products in their own.

The anti-fogging property is very popular in sheets and films used either for agricultural purposes, or for food packaging. In both cases the manner by which the property is realized is identical, but the goals of its implementation are different. In agriculture it has functional purposes – it allows maximal penetration of light into the greenhouse by keeping the sheet transparent, it prevents water from dripping from the greenhouse roof on the plants, thereby preventing the crops from heating and burning when sunlight passes through the water droplets, that function as optical lenses. In food, on the other hand, the property serves mostly for an aesthetic purpose, allowing the client a better view of the product by keeping the film transparent. In some cases the property prevents water from condensing on the packed food, which damages its quality.

The incorporation of the AF additive into the film can be done by one of two methods. In the first method, the property is added to the film during the extrusion stage using a Masterbatch or a compound. In the second, the film is coated by the material. This, second method of applying AF by coating makes the product more expensive since it requires an additional process to be added. However, sometimes this cannot be avoided since not every polymer has an AF additive that is suitable for extrusion.

Kafrit has identified this need, and after a complex development process it is offering three new anti-fog solutions for the market, which open new possibilities to sheet and films manufacturers while retaining manufacturing in a single process, in which the AF is applied by extrusion without the need to perform AF coating in a separate process.

**New AF for Nylon**
There are AF solutions for Nylon in the market, but in most cases their performance fails to meet the standards required, which are achieved in polyolefin applications. The new Masterbatch by Kafrit gives an excellent result, and it is intended to be used in layers of Nylon 6 or Nylon copolymer 6/6.6. The product was developed in collaboration with a leading European manufacturer of Nylon, it is approved for food and is used for packaging fruit and vegetables, as well as for multi-layer food packaging. By adding 6% of the Masterbatch to a 30 film 30 μm thick, an excellent result is obtained after 6 hours. By increasing the used percentage to 12%, the reaction
time becomes shorter and an excellent result is obtained after two hours.

New AF for PET-G

The new product by Kafrit is a breakthrough that sets the company as a leader on the world scale where solutions for polyester are concerned. The new product is a compound used entirely on the outer layer that faces the packaged material. A layer of only 7 µm in a multilayered complex was sufficient for giving immediate excellent results – without any waiting time. The product was tested in a cold anti-fog test (4° and 0.5°), as well as in a hot anti-fog test (60°). The product functions in a stable manner; and in a test following 4 months of storage the obtained results were identical to the non-delayed testing result. The product has approvals for contact with food, and it recently completed the development process.
**New AF for biodegradable products**

Kafrit’s arsenal of Masterbatches for biodegradable materials is now supplemented by another anti-fog Masterbatch. The new Masterbatch is commercially available. It is suitable for a wide variety of biodegradable polymers, and its recommended usage percentage is 10%-15%. The performance results of this concentrate were found to be very good.

**What does the future hold?**

The new developments by Kafrit continue to extend the list of polymers to which AF Masterbatches can be added during the extrusion stage. Alongside these, Kafrit continues to develop and invest efforts in additional solutions in the field of anti-fog in particular, as well as in other advanced technologies that extend the life of food products, their quality, and in expanding the variety of offered products in agriculture, in order to provide novel solutions in this field.

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*For additional information contact Roe Levi, Sales Manager Kafrit 972-4-6487-367, rlevi@kafrit.co.il.*