Small, Efficient Aids

Processing Materials Ramp Up Productivity and Enhance Product Characteristics

Specially developed granulated purging compound for efficient cleaning of extrusion screw

The market share of polyethylene terephthalate (PET) bottles and film is increasing relentlessly. The process of transforming PET granulates into PET films and preforms that are later used for PET bottles is associated with numerous factors that can lead to elevated reject rates. The use of suitable processing materials can help to reduce reject rates, improve product quality, and avoid downtime.

Apart from being unbreakable and temperature resistant, PET bottles are also lightweight, thus reducing energy during the shipping process. These characteristics are making PET bottles increasingly popular even for beer and wine. Inasmuch as PET films exhibit high tensile strength, robust chemical, mechanical and thermal stability, as well as transparency during the production process, PET is coming into increasing use in the packaging industry.

Process efficiency is a key factor in the manufacturing process of PET products. PET vendors are having to reduce production times in order to meet increasing demand without sacrificing product quality. Numerous factors can reduce productivity during the PET granulate manufacturing process. The most common anomalies include surface defects such as scratches, schlieren and stress cracking, as well as color and or material impurity. Although rejects are removed from the production process, they reduce machine availability and thereby increase overall costs.

These problems can be mitigated through the use of suitable external processing materials, which, unlike their in-house counterparts, comprise all products that help to optimize the manufacturing process and are not incorporated into the end product. For the past 50 years, Chem-Trend has been a leader in the external process materials sector. Under the Lusin® brand, Chem-Trend offers a portfolio of reciprocally compatible products that ramp up productivity for PET manufacturers. These products include release agents, lubricants, cleaning granulates, mould cleaners and anti-corrosion agents.

Release agents not only prevent form adhesion, but also help to improve surface quality and avoid stress cracking. The key factor in this regard is the product's robust and durable release effect, as well as its good temperature resistance. In addition, the latest generation of release agents form a film on preform and film surfaces during the moulding process, thus minimizing scratching during the downstream processes.

It is important to use an injection moulding tool lubricant that provides long lasting lubrication and soft running and that thus obviates the need for time-consuming tool re-lubrication. The lubricant should also not become encrusted or form any hard residues. In addition, the base oil should evaporate as little as possible, since an inadequate lubrication film could cause moving parts to seize up. Moreover, lubricant deposits on plastic components can ruin a tool. Here, too, the product should exhibit robust temperature resistance.

Processing agents for the processing of food packaging material requires proper certification.

Color changes always pose a problem during PET processing since all residues must be removed from the injection moulding machine plasticizer screw; otherwise such residues may be incorporated into the PET and cause schlieren. Such "ghost colors" sometimes manifest themselves a number of hours after completion of the production process, an event that in many cases results in lengthy machine downtime periods. Cleaning granulates developed specially for this process allow for efficient machine component cleaning that reduces reject rates and downtime.

Mould cleaners are used in PET manufacturing to remove residues and decomposition products from the mould. Targeted use of cleaners that remove degasifiers and oligomers leave the form in an extremely clean state, thus enhancing the quality of surface characteristics. The advantage of solvent-free mould cleaners is that they reduce downtime since they can be injected directly into the heated mould. Regular application of a long-lasting anti-corrosion agent helps keep machine components as well as moulds in good condition.

Today's processing materials are for the most part solvent-free and avoid the use of silicone and halogens, thus making them very environmentally friendly. Moreover, the fact that butane and propane use is avoided for the most part enhances the safety of the PET manufacturing process. Processing materials that are used to manufacture food packaging must also meet the applicable food safety requirements and normally are certified in accordance with NSF H1/H2 and K1/K 3 or Directive 2002/72/EC.

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