IMAGE: CHEM-TREND NORTH AMERICA

Compounders find the urge to purge

Traditionally focused on the injection moulding market, manufacturers of commercial purging compounds now see compounding as a significant growth area. ***Mark Holmes*** *reports*

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IMAGE: VÖLPKER SPEZIALPRODUKTE

Above: Völpker sees its universal Cevo-clean J-1819 grade offering a flexible purging option for compounders

procedures is very important for best results."

Another Serell tip for compounders is to use the 'disco purge' – a simple but effective process that can be applied to twin-screw as well as single-screw extruders. It involves stopping the machine screws for a short period of time (ten seconds is sufficient) and then restarting and bringing them back up to speed. This exerts more cleaning/scrubbing force against the screw flights and can be done several times during a purge. It works whether a purging compound is being used, or just flushing with the next resin.

RapidPurge is currently focusing on a purge compound specifically for masterbatch colorant manufacturers. "The extremely high concentration of pigment makes changeovers especially difficult in these applications," says Serell. "Our approach will be a little bit different than traditional mechanical or chemical compounds. We are focusing in this case on the pigments more than the resins. Since the chemical makeup is different, we need to employ a novel technology. We have some final technical hurdles to overcome, but we expect to be launching these grades before this time next year."

The current market for purging and cleaning compounds in plastics manufacturing is expected to grow at a significant rate in the next few years, reports **Völpker Spezialprodukte**. It cites a report from Precision Business Insights that forecasts 8.5% CAGR globally over the 2023-2029 period and identifies extrusion as a growing application area.

According to Dr Lutz Matthies, Head of Business Development at Völpker, there are a number of influences driving new developments in purging and cleaning. "These include the increasing demand for high-quality and consistent plastic products in various end-use industries, such as automotive, construction, packaging and electronics. These industries require plastic products that have specific properties, such as colour, strength, durability, and resistance to heat, chemicals and abrasion. To achieve these properties, plastic manufacturers need to use purging compounds that can effectively remove any contamination, degradation or colour change from the processing equipment."

He says environmental concerns also play a part. "There is also rising awareness and regulatory pressure to reduce the environmental impact of plastics. Manufacturers are looking for purging compounds that are economical in use and compliant with the environmental standards and regulations. Purging compounds can also help to reduce energy consumption, greenhouse gas emissions, and waste generation of plastic manufacturing processes."

The latest development from Völpker is its Cevo-clean 'one 4 all concentrate'. The Cevo-clean J-1819 grade is a cleaning concentrate that can be used for extruders, injection moulding machines and hot runner systems. It is designed to be used diluted with the polymer to be processed, which the company says means only one cleaning concentrate is required for nearly all commonly used polymers.

Völpker says Cevo-clean J-1819 is designed to enable a fast material and colour change, so

reducing downtime and scrap costs. The resulting cleaning extrudate can be granulated and reused, especially in cases of low contamination. It is also recommended for cleaning extruders during extended shutdowns, where it can help prevent contamination or deposit formation.

According to the company, the J-1819 purging material uses a combined chemical and physical mode of action that can clean both the surface and the inner layers of the equipment. Cevo-clean J-1819 has can be used up to 360°C (depending on the carrier polymer used) and will clean extrusion screws and barrel as well as die heads and adapters.

Matthies offers some specific practical tips to compounders for effective and efficient purging and cleaning of extruders with Cevo-clean J-1819. These include preparing a dryblend mixture of Cevo-clean J-1819 with the unfilled polymer type that is to be used in production, or that which forms the basis of the new compound to be processed. The recommended mixing ratio is 20-25 parts Cevo-clean J-1819 to 75-80 parts polymer. The mixture should be processed on the extruder using the normal processing parameters of the polymer and an amount sufficient to fill the entire extruder and die head should be used.

Efficiency savings

US purging compound producer **Dyna Purge** sees industry concerns over the impacts of labour shortages, the drive for manufacturing efficiencies, offsets to volatile resin prices and increasing interest rates encouraging use of CPCs. "Growth opportunities in the market are associated with those not using CPCs. These companies need to understand the savings and efficiencies associated with CPCs compared with 'in-house' remedies," says Bob Grzegorek, Technical Product Manager at the firm.

"Other current market influences include that many companies prefer to use one universal purge with all types of resins. This makes it easier on the associates who perform the purging. Having to use multiple types creates opportunities for mistakes. Recyclability is becoming more important as well, with the ability required to grind and reuse clean purges," he says.

Grzegorek says ease of 'post-purging' is particularly important. "Compounders need assurance that a CPC is completely removed from the system before starting the next production run. Ease-of-use with defined procedures is also required. A CPC provider that offers training and optimisation of the purge process is highly valued."

Dyna-Purge says its focus is on mechanical purges with wide heat ranges, providing ease-of-use across multiple processes and resin types. The company provides a non-abrasive scrub utilising a 'scrubbing polymer' for this purpose, with its latest development being Dyna-Purge L, a CPC that is said to use an easier flow carrier matrix that works well in both single- and twin-screw applications.

Grzegorek's practical tip for compounders for effective and efficient purging and cleaning of extruders is to fill the flights completely without overfilling for twin-screw applications. "Utilising a 'disco purge' procedure while maintaining full flights is best practice," he says. "Increasing die and adaptor heats, if applicable, will also help release stubborn pigments and dyes at 10°C (50°F) minimum or hotter, without exceeding recommended temperatures for your equipment or resin system."

The challenges posed by new resins, compounds and alloys in plastics compounding for effective and efficient cleaning of extrusion machines are highlighted by **Asaclean**. "To meet the needs of sustainable and competitive businesses, purging compounds have been developed to offer solutions such as concentrates and specific purges for different processing needs including broader temperature ranges, as well as providing compatibility with various production mixes or base resins," says Hector Sanchez, National Sales Manager.

"The current market for purging compounds is growing and competitive, as plastic processors are increasingly aware of the benefits of using a commercial purging compound for waste reduction and process efficiency. Any machine with a screw

IMAGE: ASACLEAN

Left: Asaclean purging compound being peeled away from the screws