

White paper

PET preforms moulder achieves higher supplier rating using Ultra Purge™ 5160.

Due to black specks, one European PET moulder was seeing batches of up to four billion preform parts rejected. This led to the implementation of a maintenance programme using Ultra Purge™ 5160, and with great success.

Using a suggested amount of the product, the moulder followed a purging procedure that took just five minutes. Six months later, checks showed very good results.

Like many moulders, Chem-Trend's North-West Italy-based customer had seen PET resin flow scrape carbonised contamination from machine parts and carry it downstream. The end result was that black specks were appearing in moulded preforms several hours into new production runs.

Although preform defects are noticed as soon as bottles burst in the blow-moulding station, just a small fraction of non-compliant parts will mean the entire production batch is rejected. Being forced to scrap good quality preforms not only increases production costs but also weakens the supplier's rating.

Moulders commonly find that black specks are being flushed into moulded parts hours after production has started. A key cause is the tendency for liquid colourants to stick to metal surfaces and degrade, causing contamination to build layer upon layer. Add temperature, shear rate and pressure factors to that and, over time, degradation becomes critical.

When layers of contamination reach this level, polymer flow and moving parts act to break those contamination layers up, detaching them from metal surfaces so they flush into moulded parts. This consequence of black speck contamination can last a long time.

As a heavy metal component, the shooting pot has great heat inertia. Its lengthy heat-up and cool-down times contribute to the degradation of the PET resin and pigment in contact with its surfaces. Even empty shooting pots retain a thin layer of resin that will degrade during a regular mould maintenance production halt, or over a weekend.

The severity of the problem depends on following reasons:

- How long are production batches?
- How many colourants and additives are used?
- How many stop/restarts are planned (mould maintenance, weekend shutdowns)?
- Is there a preventive maintenance program?
- Unpredictable factors like power shortage, equipment breakdown etc.

If quality controls fail to detect the black speck problem in time and a non-compliant production batch reaches the blowing station, contaminated bottles burst and the entire batch is rejected.



PREVENTIVE MAINTENANCE

When an Ultra Purge™ sales representative visited the Italian PET moulder, scrap rates were unacceptable. After an initial test showed the effectiveness of Ultra Purge™ 5160, Chem-Trend collaborated with the customer to devise a simple yet effective preventive maintenance approach: This saw the introduction of a regime using Ultra Purge™ 5160 which involved screw and barrel cleaning at the following times:

- After each mould change and regular maintenance (weekly basis)
- During every dark to light colour change
- Cleaning during shut downs and start ups on week-ends or long maintenance period

Using a suggested amount of the product and following a collaborative process, the moulder implemented a purging procedure that took just five minutes. Six months later, checks showed very good results.

Because contamination is ejected from the system as the machine starts up, once process parameters reach desired values all preform moulds will be black speck free. Consequently, enhanced PET preform quality is a key advantage of Ultra Purge™ 5160 use.

Having embraced a proactive approach to screw and shooting pot cleaning, the preform customer's contamination layers are now removed as they form.

CONCLUSION:

Using Ultra Purge™ preventatively 5160 will help PET preform moulders achieve a better supplier quality rating by improving the machine start-up.

An injection moulding machine kept in good shape maintains a predictable production restart. Recurrently flushing out contaminated layers avoids impurity build-up and random parts contamination.

The reject reduction our Italian PET moulder experienced with Ultra Purge™ 5160 use had the direct advantage of cutting downtime and scrap while improving the firm's environmental footprint.

