

XACTIVE- CLEANING CUTS DUST IN PET PREFORM HOT RUNNER SYSTEMS

PET preform injection molding is a highly competitive business, so production efficiency is critical to success. Systems needed to be up and running as much as possible, making preforms as perfect as possible. The hot runners in the mold are a fundamental element in the total system, so any anomaly in their operation can compromise output.

In addition to mechanical or electrical issues that can affect the efficiency of a hot runner system, there is also another problem that processors should be well aware of: dust. Over time, PET powder builds up on the inside the cylinders of the actuators. Initially, this powder does not cause any problems, but as it accumulates, it inhibits the movement of the pistons, eventually severely compromising the quality of the preforms. If not treated, this accumulation can cause the system to seize up completely.



cylinders, making sure that any PET dust particles created in the system are evacuated every cycle. This solution should on its own be sufficient to keep the system clean. But just to be absolutely sure, there is also a “boost” function that can be activated to perform a forced cleaning cycle, at intervals that can be set by the user (every 40,000 cycles for example). This process lasts for a few tens of seconds, so it has no impact on productivity.

WHAT MODIFICATIONS TO EXISTING EQUIPMENT ARE NEEDED?

A hot runner system incorporating XActive-Cleaning includes additional channels within the plates themselves, so there are no obvious differences from a conventional hot runner system, apart from an additional air connection with the XActive-Cleaning device. The cylinders for actuating valve movements have a special design, and there is also some special pipework feeding

the box where the dust is collected. This box is located on the ground near the injection machine’s HMI zone. The connection between the XActive-Cleaning device and the machine is purely pneumatic. No changes at all are need to the injection machine.

WHAT DOES THE OPERATOR NEED TO DO TO MANAGE THIS SYSTEM?

The XActive-cleaning system is machine-independent and operates using pneumatic valves operated by the same circuit that manages the movement of hot runner valve, so no modifications are necessary to the pneumatic system. The only extra task that the operator has to carry out is the regular cleaning of the easy-to-access filters installed on the external box.

Important producers of hot runners have known about this problem for a long time, and a lot of work has gone into developing ways to counter it. SIPA is among the leaders in this area.

It has developed solutions that keep production of dust to very low levels, especially when molding systems are running with virgin resins. But increasing performance requirements, and the growing use of recycle - rPET - are complicating the issue. For this reason, SIPA several months ago decided to take a new look at dust, and to devise an easier and more cost-effective solution to the problem.

SIMPLE AND SMART

“What we wanted was something that was smart and simple at the same time,” says SIPA’s Global Engineering Manager Injection Molds & Hot Runners. “Simplicity is key to ensuring that the risk of malfunction is minimized.” The highly ambitious goal was to have a complete hot runner system that needs maintenance only to

carry out standard renovation operations - that is, to replace worn components. A system that could run continuously for five million cycles before those moving parts subject to wear - piston seals, valves, and so on - needed to be replaced. In a system running with a cycle time of seven seconds, that means it would be able to work continuously for 10,000 hours. Guided by this vision, SIPA’s engineers came up with a system, which SIPA has since patented, which adapts the compressed air flows, normally used to move the hot runner valves, to also blow out the very few plastic particles that deposit inside the actuators each cycle. SIPA calls the system XActive-Cleaning.

HOW DOES XACTIVE-CLEANING WORK?

The hot runner system is equipped with a supplementary circuit incorporating a series of valves which, controlled with appropriate logic, govern the entry and discharge of air from the

