

How to clean tempering channels?

Removing rust and dirt with cleaning agents through pumping systems, and using treated water in closed cooling cycles, are alternatives that improve cycle times and the quality of molded parts.

With information provided by iD Additives, Inc.

In the same way that energy is supplied to raise the temperature of plastics, in its processing it is necessary to remove energy to bring them back to their solid state. In this process, cooling or tempering channels are used in the molds and tooling, where a coolant medium, usually water, is circulated.

It is very common that in molding plants we tend to ignore the importance of tempering channels. Sometimes we connect the hoses either way, and even run the mold without water. However, one of the biggest enemies we have is the deposition of waste, usually lime and rust, which accumulates on the walls of the tempering channels, preventing the proper removal of heat.

Many times, we believe that a process is running properly because we are "taking out good pieces".

However, this is not necessarily true. A process is running correctly if the cycle time is also appropriate, and the manufactured products have consistent quality. This depends to a large extent on the cleanliness state of the tempering channels.

Maintenance of injection and blow molds, for example, requires these channels to be cleaned regularly. Any material build-up affects cycle time, because plugged channels reduce heat transfer efficiency significantly and also require more coolant water pumping pressure. All of this results in a longer cycle time, and therefore higher operating costs and lower machine productivity.



The Eco-Pro iD is a cleaning agent pumping and filtering cart for deeming tempering channels. It is an easy and safe way to clean, without generating environmental pollution.

Why are the channels in a mold plugged?

One of the sources of pollution and blockage is the environment if open cooling towers are used on the plant. If the cooling medium of a mold moves within a closed cycle, there should normally be no deposition of waste, but this can occur due to water with high alkalinity and hardness. Mold surfaces are usually the hottest point of a molding system, and this accelerates precipitation. Even if the oxide and lime film is the thickness of a human hair, it is possible to lose up to 20% in the efficiency of heat transfer.

One of the ways to solve this is to implement a water treatment system, which minimizes the effects of corrosion. Corrosion causes iron and other metals to accumulate in water, and inadequate water treatment can cause these corrosion products to be deposited in the tempering channels, impairing heat transfer.

It is also possible that bacteria may be introduced into the closed-cycle system during mold changes, and a biological layer of microorganisms are generated that can also impair process productivity.

How to clean the mold channels?

Even with very good water treatment, it is necessary to occasionally clean the channels inside the molds. The most common procedure is to connect the mold to a pump that circulates a cleaning solution inside the mold.

For example, the manufacturer iD Additives, Inc., supplies the Eco-Pro 360 trolley, a pump and mounted filter system that can clean the tempering channels in molds, film dice, heat exchangers and other products. According to the manufacturer, it can be used with the Eco-Pro iD, a water-based and environmentally safe cleaning agent, which can remove rust and corrosion quickly and effectively. It can also be used with other cleaning agents.

In addition to cleaning oil, debris and corrosion, this type of cleaners generates a protective layer inside the channels, which delays the generation of new rust depositions.

Once cleaning is finished, it is essential to purge and dry the mold with compressed air. For this, it is recommended to attach the hoses and blow through them air until water comes out of the mold. Also, remember that not only do you need to clean the mold, but also the connections.

Maintaining inactive molds

Western Case Inc., from Riverside, California, is a leading company in blow molding of transportation cases, as well as large industrial parts, including spa products, traffic separators, automotive products and more. With 12 blow molding machines and more than 150 internal molds, Western Case employs a strict manufacturing protocol and operates 24/5. They perform many small runs, typically producing batches of 5,000 pieces. They must make up to 10 mold changes per week, a process that can take 2 to 10 hours per mold change.

"Our workflow audits showed that most of our labor was being spent on mold and maintenance changes," said Jennifer Clark, an operations manager at Western Case. "As part of our ongoing improvement, we implemented a new preventive maintenance program to keep our molds ready to go."

A major problem in mold maintenance was that cooling channels were often clogged with lime and rust, due in part to the hard water being used in the plant. Having worked with iD Additives foaming agents and purging products, Western Case contacted iD Additives about the new Eco-Pro 360 mold cleaning products.

Bryan Whitaker, iD Technical Manager, sent an Eco-Pro unit to Western Case and traveled to Riverside for a test. It didn't take long to see great results. "We connected the Eco-Pro to clean the cooling lines in one of their molds, and when they saw how fast and effective it was, they bought the unit," he said.

Today, Western Case uses the Eco-Pro as part of its regular preventive maintenance program. While 12 machines are operating in the workshop, the 150 inactive molds are serviced on a schedule that includes cleaning cooling channels with Eco-Pro. "Eco-Pro is now an important part of our preventive maintenance program," Clark said. After knowing when it's time to change the molds in a machine, the mold coming from the workshop is cleaned, repaired, and ready to go. Eco-Pro is easy to use and has already helped us reduce downtime and save money."



Laura Florez, PhD
Editor in Chief
Tecnología del Plástico
laura.florez@b2baxioma.com
www.plastico.com