

## How to resolve build-up issues

Improvements in quality, cost and productivity are critical to succeed in today's manufacturing environment. Working on performance opportunities involving mold release can be one way to achieve these goals. Mold build-up, sticking, gloss control and surface quality are the most common challenges involving mold release. This article focuses on build-up and four primary techniques for improvement.

**Build-Up** results from that part of the release agent film which does not transfer to the molded part. In addition, when the release is imperfect or the polymer is uncured, a portion of the polymer also remains behind adding to the build-up. Analyzing the composition of the build-up can be helpful. When too little mold release is applied there will be more polymer in the build-up. When the build-up contains more release agent than polymer, more release agent is being applied than is necessary.



- 1. Clean molds are essential to minimize build-up.** Clean molds provide the foundation for a smooth, easy release with minimal build up. Effective cleaning means longer life for molds and less cost because the molds are in production longer. Cleaning molds in an ineffective manner allows more opportunity for build-up to remain behind. That build-up causes imperfections in the molded part. Dry ice, plastic beads or glass beads can be used for thorough cleaning. Huron Technologies also offers specialized mold cleaners. Regardless of the type of cleaner, all traces of the previously used mold release and any polymer residue must be totally removed without damaging the mold surface.

Every molding operation needs to establish their own standard of mold cleanliness. This standard expresses the visual appearance and manual feel of an acceptably clean mold. For example, in a shoe sole mold with a highly polished surface, a visual standard might be that all of the mold surface appears polished. A dull area that varies from the general polished surface could indicate remaining polymer build up. These standards should allow you to communicate what level of cleanliness is required to production workers.

Any chemical cleaners must be removed from the mold before conditioning or seasoning. Removing the chemical cleaner prevents any adverse interaction with the polymer when the first part is molded. After cleaning, **correctly conditioning or seasoning the molds with up to three layers of mold release provides the most effective start up process.** Each company will have a slightly different process for seasoning their molds. A well seasoned mold yields an easier, smoother release on the first part after cleaning.

- 2. To address build-up review the process of applying the mold release.** Conflicting goals may be at work. Production workers want an easier release when demolding parts; therefore, they may apply too much mold release. Process engineers want the correct amount of release to be applied. At the same time engineers want the ability to adjust release output short term as they pursue immediate productivity goals. Reduction and control of scrap is always important. To prevent the over and under application that causes build-up, establish the effective mold release output range and verify that application output remains consistent. Avoiding incorrect application of mold release also helps to keep costs in line. Often spray training can demonstrate the proper output parameters and reinforce correct application techniques.
- 3. Perform a manufacturing audit to effectively control manufacturing to reduce build-up.** The right time to perform a manufacturing audit is after a new part or line is successfully in production. Taking specific measurements of your process provides a benchmark. Then, when production problems strike, that benchmark is there to measure against. For more information on manufacturing audits see our technical article on Manufacturing Audits. Recently, a Huron Technologies' customer was having build-up problems. After gathering the current manufacturing parameters, he compared them to the results from the audit of the previous year. The differences between the two audits identified the source of the problem. Beginning with audit data can also help in defining the targets that process improvements are expected to generate. Huron Technologies offers a suggested form for customers to use to effectively maintain or improve a manufacturing line. This form is available by sending a request to [info@hurontech.com](mailto:info@hurontech.com).

- 4. To minimize build-up select the right mold release or custom formulate a new release.** Information on manufacturing parameters is key to the selection process. These parameters include the type of material the molds are made of, the type of polymer the part is made from, the mold temperature, dry times, cure times and other specific manufacturing process information. These details assist in determining the release agent that is robust enough to work effectively for your specific molding process. In one custom formulation project, the goal was to reduce the effort needed to clean off the customer's build-up. Ingredients were included to customize the build-up residue. The new formulation yielded a soft, wipe clean residue. The softer residue allowed quick and easy cleaning which permitted molds to stay in production, molding more parts, for longer periods of time.

While mold release is a small proportion of manufacturing costs, the right release agent can make all the difference! When you need a more robust mold release or a custom formulated release contact Huron Technologies at **1-800-275-4902**.

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