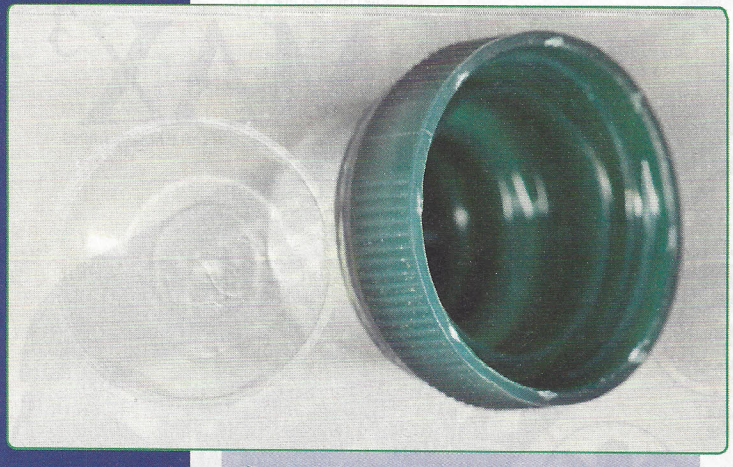
Plastic bottles pop out of the mold

Plastic-injection molders have used standard thin-density chrome-tool coatings for decades. Coatings reduce friction, corrosion, wear, and improve part release. But recent material developments and complex product designs have created tough challenges for designers who must meet fast production goals. One solution to help reduce friction and facilitate part release is a treatment called Metalife/polymer (MLP) from **Metalife Industries Inc.,** Reno, Pa. (*www.metalifeind.com*)



Core pins that form the triple entry threads for a sport-drink bottle cap are coated with MLP coating to aid product release.

The proprietary MLP tool coating is based on the same molecular-bonded thin-density chrome used by plastics molders. But this compound consists of a petrochemical wax combined with a polishing agent and other ingredients that promote polymer impregnation into the chrome. After bonding the chrome to the substrate material of the molding surface, the tool is heated to 195°F. Under heat, the highly cross-linked, long-chain polymer flows into the porous microcrystalline structure of the chromium. The next step involves polishing the melted polymer and chrome to help force the polymer deep into the pores, creating a smooth, hard, and lubricious surface with a low coefficient of friction. Coating thickness is 0.0001 in.

Erie Plastics Corp. (EPC), Corry, Pa. (*www.EriePlastics.com*), for example, has been molding a sport-drink bottle with a single-entry thread on top to mate with an easy-open valve. The cores molding the thread functioned well with another coating. But changing the bottle design to accommodate a triple-entry thread enlarged the exposed surface area. This increased friction between the bottle and mold, making release difficult.

To solve the problem, Metalife plated the mold cores on all surfaces for corrosion resistance and treated the thread surfaces with MLP. "The results were immediate — EPC has been molding the triple-entry-thread bottle for more than a year with no 'hang ups' from product release," says EPC engineer Dave Bird.

Precise Technology Inc. of North Versailles, Pa. (*www.precisetech.com*), is another long-time user of standard Metalife chrome platings who switched to MLP to improve mold-release properties. The company specializes in close-tolerance plastic products for medical use. According to tooling manager Ken Lupton, better release properties let them eliminate part distortion problems in some of their molds, including "pin push," and bent legs on thin parts. It also reduces difficulties due to undercuts on cores and blocks of multiple cores. MLP, he continues, also serves as an excellent protective coating against corrosion and generally reduces wear. In addition, it eliminates lubricants on moving parts that mate together, such as stripper sleeves running against cores. "This is invaluable in making medical products where a clean product free of foreign substance is required," he concludes.

—Jean Hoffman

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