



# Fitting Filtration

Plastek began using filters to achieve full-flow filtration and eliminate its debris problem for good.

## Debugging plastic production with improved filtration

By Drew Robb

One way to cut manufacturing costs is to move plants overseas and take advantage of lower labor costs. Another alternative is to move production closer to the customer, reducing shipping time and expenses.

The Plastek Group of Erie, Pa., took the latter approach. The tool and die and plastic injection molding firm makes containers for about a million deodorant sticks per week, in addition to other types of plastic caps and lids. One of its largest customers is in North Carolina, more than 600 miles away. Last year, Plastek shifted a portion of its molding operations to a plant in Hamlet, N.C., less than 30 miles from the customer.

“With this facility, we save on 12 hours of trucking time and the cost of transport,” said Ray O’Donnell, corporate facilities manager for Plastek, who oversaw the transition. “Being closer to the customer allows us to be in better communication and makes it easier to share inventories.”

As part of its detailed preparation, Plastek spent millions upgrading the plant infrastructure, including installing Tekleen automatic water filters for process cooling to prevent unplanned shutdowns.

“We have saved a tremendous amount of time with the Tekleen filters, and we no longer have to shut down production because of clogged screens,” said Bob Durden, maintenance engineer at the Hamlet plant.

### Keeping Cool

Founded in 1952, family-owned Plastek employs about 2,000 people at its plants in the U.S., Venezuela, Brazil and the U.K. The Hamlet plant is its first U.S. location outside of Erie. The 253,000-sq-ft campus was first owned by Owings Illinois and then by Rexam Ltd. Rexam closed the plant in late 2009, laying off 200 employees, and Plastek acquired the location the following April. But before shipping the equipment from Erie and reopening the 1982 vintage plant, the company conducted a complete overhaul.

“We basically gutted the plant and started over with updated water systems and filtration,” O’Donnell said. “We thoroughly updated it to how we manufacture plastic parts here in Erie and at our three international facilities.”

To help with the upgrade, Plastek hired some of the staff who had worked for Rexam and were familiar with the facilities, including Durden, who has been with the plant since 1983. In addition to the water system, Plastek changed the air compressor and piping and added automatic guided vehicles. The company also installed high-efficiency T5 and T8 fluorescent lighting and used 9,000 gal of paint to beautify the plant and make it a more pleasant place to work.

Among the upgrades to the water system was the installation of Tekleen automatic filters on the cooling towers and chillers. Plastek started using these filters in

Erie in 2005, particularly as a means to address cottonwood season, when the cottony seedlings and other organic debris would make their way into the cooling tower and clog the downstream screens. The company would wrap the towers with a prefilter media belt in late May and June, which sometimes required cleaning several times per shift. This helped, but employees would still find shredded organic material downstream.

While filter clogging is the most obvious problem, the bigger issue is the way organic material leads to scaling in the pipes. Scale occurs when the dissolved calcium and magnesium in the water bind rust, sand and organic material to metal surfaces. For plastic injection companies, these deposits gradually build up inside pipes, molds and heat exchangers, reducing water flow and cooling capacity. In order to get full-flow filtration and eliminate the debris problem for good, Plastek started using Tekleen filters.

“By going with 100% full-flow filtration, we can catch 100% of the contaminants that are in the tank or are returned to the tank through the return piping,” O’Donnell said. “With good water chemistry, a good rust inhibitor and good biocide, the inside of the pipe should remain clear with no buildup of calcium carbonates or other materials.”

### Keeping Clean

Another advantage of the filters is ease of maintenance, O’Donnell noted. The filters use a unique self-cleaning mechanism that allows an uninterrupted flow of filtered water, even while cleaning takes place. The dirty water flows in around the outside of a coarse filter that removes the larger particles. This prefiltered water then flows to the other end of the filter housing, where it passes from the inside to the outside of a finer filter and then through the outlet. Over time, as it removes particles from the water, those particles clog the filter, reducing water flow and pressure. At the outlet, an adjustable pressure differential switch opens a small flush valve to start a cleaning procedure when a threshold is crossed.

Rather than taking the full water flow to initiate a complete backwash, the filters contain a set of small cleaning nozzles arrayed around a central shaft. Opening the flush valve lowers the water pressure within the cleaning unit, and the nozzles vacuum the dirt from the inside surface of the filter screen. A hydraulic motor and piston cause the nozzles to rotate and move axially in order to cover the entire screen surface in five to 10 seconds. At that point the flush valve closes and the cleaning mechanism returns to its starting position.

“With the auto cleaning feature, not only do we save time, but the filters clean themselves while we are in production,” O’Donnell said. “We can’t afford to shut down our production, and with Tekleen filters we don’t have to cycle the valves and go into an offline operation.”

### Avoiding Shutdowns & Damage

The Hamlet facility does not have as big of a problem with cottonwoods as the Erie plants do, but there is a bigger issue with insects and other airborne material, including high concentrations of sticky pollen. Prior to Plastek’s revamp, the facility relied on wire mesh strainers on the machines to keep them clean.

“The bugs, the leaves, the sticks and everything else that can get into the cooling tower would end up in the wire strainers on the machines,” Durden said. “Then the oil temperature goes up, your machine goes down and a mechanic has to pull the strainer out and clean it.”

While shutting off the water, pulling the wire strainer, and cleaning and replacing it would take only about 15 minutes, the shutdowns would stretch much longer.

“Quite frequently a five-minute shutdown turns into a two-hour production loss by the time the technical people have the time to get over there, start the machine up and ensure that they are making good quality product,” Durden said.

To avoid this problem, Plastek installed four filters—two on the water towers and two on the chillers, so that the debris never reaches the wire strainers. O’Donnell purchased filters from the new LPF Series of low-pressure filters, which require a minimum of 20 psi for cleaning and therefore save even more money due to less electricity being needed for pumping than with regular filters. Durden said the filters have completely eliminated the need to clean the strainers, allowing the equipment to stay online. In addition, having an unrestricted flow of cooling water avoids hidden equipment damage. **IIWWD**

Drew Robb is a freelance writer with Robb Editorial of Los Angeles. Robb can be reached at [drewrobb@sbcglobal.net](mailto:drewrobb@sbcglobal.net) or 323.660.4862.



The filters eliminate the need to clean the strainers, allowing the equipment to stay online.