

# Automated Parts Washer Keeps Up With 140 Screw Machines

**Watts Regulator Company** (Chesnee, South Carolina) is a large screw machine shop, with 140 screw machines turning out more than 500,000 parts a day. Founded in 1873, the company is a global supplier of home heating and plumbing equipment for industrial and DIY markets (through Home Depot, Lowe's and so on). It is a leading manufacturer of pressure relief valves for hot water heaters. The Chesnee plant produces turned bar components for about 5,000 different valves. These parts range from  $\frac{1}{8}$  inch to 5 inches in diameter, with internal threads and lots of blind holes where chips can hide. About two-thirds of the parts are made of

brass; the rest are cold rolled steel or stainless steel.

The company had trouble meeting stringent cleanliness specs at such a high volume with aqueous cleaning. "The aqueous washer we were using was top-of-the-line, but it just couldn't meet our cleanliness spec, which is basically zero contamination," says Rick Wilson, process engineer at Watts Regulator. So the company decided to install an automated washer that cleans with non-chlorinated solvent.

The Universal 71C dual-chamber hydrocarbon system from Dürr Ecoclean GmbH, Filderstadt Division, North America (Wixom, Michigan) was installed in October 2000. It runs 16 hours a day, 6 days a week. In a typical day, it cleans 100 to 125 different parts, totaling about half a million pieces. Target volume is 60 baskets per hour, but it usually runs at least 64, a cycle time of nearly 4 minutes. It now meets or exceeds all quality and productivity targets and has reduced operating costs by 80 percent.

"I'm very, very impressed with the machine," Mr. Wilson says. "Hydrocarbon solvent not only cleans better, but since it's non-chlorinated, it's also safer and more environmentally friendly."

Another advantage is lower operating cost. Watts Regulator used to spend \$5,000 to \$7,000 a month on its aqueous system—for chemicals, energy for heating, and handling contaminated water. It now spends just \$1,000 a month. Uptime is virtually 100 percent, according to Mr. Wilson, which is crucial with so



Watts Regulator Company has been using the Universal 71C dual-chamber hydrocarbon system since October 2000.



Target volume for cleaning on the Dürr Ecoclean is 60 baskets per hour.

drying—seeking out moisture in the threads and holes—completes the process. The solvent is then distilled for reuse, through a vaporization process that leaves the oils in liquid form. Watts removes the oils every 2 weeks because the machine is in virtually constant use, but he plans to add a continuous distillation system to automate this step.

Other than the oil removal, very little maintenance is needed. The same is true of training, as operators learn to run the machine in just 2 hours. Those who are also responsible for preventive maintenance get comfortable with the procedures in a few days.

“From the time it arrived, we were washing parts in less than 2 days,” reports Rick Wilson. “You just add electricity and air and fill it with solvent. On the rare occasions that we’ve needed help, Dürr has been very, very responsive, getting parts to us in 24 hours.”

*For more information about hydrocarbon systems from Dürr Ecoclean, call (248) 960-4630.*

many different parts to wash. Simple changeover contributes to this high productivity: The Dürr Ecoclean machine has eight parts programs, which can be changed at the touch of a button.

“You can set up a new program in 5 minutes and program it for whatever you want,” says Mr. Wilson. “We run some parts with full rotation, which is best for removing chips. Others we oscillate 10 to 15 degrees side-to-side. You can set it by degrees. Then you just choose the program you want to run and push the basket down the conveyor.”

The parts baskets come from the screw machines via roller conveyor, past an optical sensor that triggers the start of the cleaning cycle. The first stage is a unique injection flood wash, which gets into the nooks and crannies and removes 95 to 98 percent of the heavy oils and chips, according to Mr. Wilson. The parts then proceed to a second chamber for vapor degreasing, to remove any remaining oil. Vacuum



The Ecoclean system typically cleans 500,000 parts a day at Watts Regulator Company.