

# Aqueous System Handles Critical Parts Cleaning

At 200,000 rpm, even small chips in the oil passages of a turbocharger can hamper diesel engine performance. Engine manufacturers need precision parts cleaning and CNC machining. For suppliers such as Honeywell Turbo Technologies (Torrance, California)—which delivers about 8 million Garrett turbochargers annually to Caterpillar Inc., International Truck and Engine Corp., Detroit Diesel and others—this means meeting tighter cleaning specifications than ever before.

“Our customers require that we meet specifications to less than 200 microns,” says Hector Richarte, manufacturing engineer at Honeywell. “We’re experts in turbochargers, but not in meeting such strict cleaning requirements. The systems we had been using could not meet these requirements, but Dürr Ecoclean GmbH (Filderstadt, Germany) convinced us that it could accomplish such work consistently.”

The company installed a Dürr Ecoclean 81W system in mid 2003 at its plant in Mexicali, Mexico, and it has been running

virtually 24/7 since that time. Its success led to increased volume and the addition of a second system in October 2004.

“All of our production runs through these machines,” explains Mr. Richarte.

The part involved is the turbocharger’s center housing, which holds the turbine wheel and the compressor wheel. The cast iron housings, which are about 6 inches by 8 inches by 4 inches, are CNC-machined to tight tolerances and shipped to Mexicali for assembly. The part geometry is complex, with channels and blind holes where chips can hide. The 81W removes virtually all of the chips using a three-stage process. First, large chips and smaller chips are removed with an injection flood wash, which creates a high turbulence, the manufacturer says. Smaller particles are then removed with ultrasonics, and an aqueous solution completes the process. This combination is thorough, according to Mr. Richarte, and several other features of the cleaning system also make it effective.

“Having a round cleaning chamber instead of a square one is also crucial because there are no crevices where dirt can get trapped, which can enhance the cleaning,” says Mr. Richarte. “Even so, the chamber is rinsed and flushed after every step, just to be sure.”

With the Dürr model, vacuum drying supplements hot air drying to ensure that no moisture remains in the blind holes and channels.

The cleaning process is enclosed in an 11-foot by 6-foot by 7-foot cabinet. According to the manufacturer, the modular

About 100 housings per hour go through the washer, which removes chips as small as 200 microns.



design makes accommodating unusual customer requirements possible, and users can also disassemble the machine and move it if necessary.

Honeywell prefers the aqueous process because it virtually eliminates the need for chemical disposal, while helping the Mexicali plant comply with the company's global environmental and safety policies. Because of the internal regeneration system built into the machines, the process works as a wastewater-free operation.

Honeywell was concerned initially about acquiring equipment from Europe and wondered if time and language barriers would

Hector Richarte, Honeywell manufacturing engineer, monitors the automated aqueous cleaning system on the control panel screen.



**"It's the best technology, and it pays for itself."**

Hector Richarte  
Honeywell Turbo Technologies  
Mexicali, Mexico

To meet a 200-micron cleaning spec for its turbochargers, Honeywell chose the technology chips can't hide from: aqueous cleaning from Durr Ecoclean.

"Our old systems couldn't meet such a requirement," says Hector Richarte, Honeywell manufacturing engineer. "But Durr does — consistently."

Two Durr 81W machines run virtually 24/7, automatically cleaning 100 parts per hour with:

- easy, cost-effective operation
- no chemical or wastewater disposal
- compact, modular design
- ultrasonics, vacuum drying and more

Durr Ecoclean's complete range of systems (aqueous, solvent and hydrocarbon) can meet your parts cleaning challenge, too. Call Volker Lehmann today at **248-960-4630**.



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lead to problems and delays in obtaining spare parts. "The support from Durr in Wixom, Michigan, has been great," reports Mr. Richarte. "Installations have gone smoothly, and operators can easily run the systems. All of the steps are displayed on the control panel screen, which identifies problems, should they arise."

"I don't know if other turbocharger manufacturers clean to 200 microns," says Mr. Richarte, "but Durr provides us with the technology and the equipment to clean the parts to give our customers the quality they require." ■

*For more information from Durr Ecoclean Filderstadt, call (248) 960-4630 or enter **MMS Direct code 218RB** at [www.mmsonline.com](http://www.mmsonline.com).*