



# Medical Coatings Find a Home in Indiana

ANODIZING LINES ARE CRITICAL FOR BIOCOMPATIBILITY IN ORTHOPEDICS.

Nearly two thirds of the world's orthopedic product manufacturers, including the medical industry's dominant names, are located in Warsaw, Ind.

Supporting those orthopedic manufacturers is a diverse and exceptionally local community of Tier 1s and specialty services providers, including Whimet Inc., a prominent, second-generation provider of anodizing and ultrasonic processing, both of which are critical for proper performance of the medical implants that restore mobility to more than one million Americans each year.

Implants have an intimate impact on human patients, and what is required of orthopedic device companies and their supplier families is unrivaled in terms of quality, reproducibility and documentation.

President Lori Whitehead and Vice President Chad Whitehead comprise Whimet's senior leadership team. Lori's earliest memory of the business was a discussion with her dad, founder Murvel Whitehead, in about 1973 as he hand-polished a hip replacement component and explained how it would work.

"The implant industry as it is known today was in its infancy," Lori says.

## FROM MOWERS AND BOATS

Founded in 1970, Whimet began by offer-

ing polishing, buffing and deburring to a customer base that included manufacturers of medical devices, as well as furniture, telecommunications devices, lawn mowers and boats.

"All operations were manual," Chad says.

In the years that followed, Whimet added passivation, anodizing, ultrasonic cleaning, electropolishing, vibratory finishing, three types of abrasive blasting and laser etching to its stable of services, while also opening a second location to accommodate all of its post-treatment services.

In 2007, the company was awarded its first ISO 9001 certification, and it currently is certified to ISO 9001:2008.

Lori and Chad Whitehead took over the helm of the company in early 2007 and learned that if the company was to continue to grow, additional processing capacity and significant automation would be needed.

"The first goal was to consolidate operations into a single large facility, thus streamlining handling and transport," Lori says. "The second immediate need was to identify an equipment supplier for its first automated line."

Lori spent the first 15 years of her career on the East Coast, selling enterprise resource planning software systems and later software

implementation services before deciding to move back to Indiana to work with Chad, who had managed Whimet operations for more than a decade.

## NEW FACILITY AND EQUIPMENT

Together, they waded into the complex tasks of facility design and finding an equipment supplier who was best qualified to design and manufacture a line for one of the company's most critical processes: anodizing.

At the time the new line was being discussed, Whimet was doing black and clear anodizing. The management team worked with production workers and major customers to establish some broad requirements for the new system.

"We had a reputation for very high consistency of results," Lori says. "We needed to maintain that high standard while also gaining the ability to do additional colors in-line. We wanted the ability to process higher volumes efficiently, yet most of our work involves highly specialized volumes—sometimes as few as one piece. So we needed a system that was extremely agile and cost-efficient to operate, regardless of the parts volume."

The team talked with numerous suppliers of equipment and chemistry, and tentatively decided to work with Walgren Co.



The anodize line has 27 stations, two fixed load and unload stations and 26 tanks.



Owners Chad and Lori Whitehead.

## WHY WARSAW? It's the orthopedics capital of the world.

So how did the town of Warsaw, Ind., with about 12,000 residents and two hours from Chicago, get to become the "orthopedics capital of the world"?

According to a study done by a life sciences group, with more than a dozen orthopedic manufacturing companies like Zimmer, DePuy and Biomet based in the town, Warsaw's collective enterprise earns more than \$11 billion in annual revenues,

representing better than a 50-percent market share in the U.S. and more than a 33-percent market share in the world.

In 1895, Revra DePuy founded DePuy Manufacturing in Warsaw to make wire mesh and wooden splints, becoming the world's first manufacturer of orthopedic appliances. A few of his employees later split off and formed their own manufacturing plants, and the rest is medical history.

A study done by Kosciusko County says its orthopedic industry cluster makes a significant contribution to the regional and state economy, employing about 6,800 workers and representing nearly one in every four jobs in the county.

This level of employment ranks alongside Orange and Los Angeles counties in California, and Minneapolis, Minn., as the largest medical device work forces in the country.

of Grand Rapids, Mich., a leading supplier of systems for all anodizing types, including chromic acid, sulfuric acid, hardcoat, phosphoric acid and boric sulfuric, and titanium anodizing.

### STRONG PLATING REPUTATION

Walgren also had a strong reputation for plating and electrocoating systems, and for the design of cost-efficient environmental management systems.

"We arranged visits to see two of their lines, and what we learned from those customers essentially confirmed what we had been told," says Chad, who commissioned Walgren to build the Whimet line and, since the new facility was being built simultaneously, to assist with building specs that would optimize the line's efficiency.

The anodize line Walgren built has 27 stations. There are two fixed load and unload stations, and 26 tanks, each 54 x 64 inches deep with varying widths. Anodize chemistry tanks are 1-inch polypropylene; tanks for cleaner, rinses, sealer, dye, etch and passivate are 10-gauge 304 or 316 stainless steel.

The system's two 1,500-lb. capacity programmed hoists are each equipped with a variable-speed transfer motor that moves up to 200 fpm and a variable-speed lift motor that moves up to 95 fpm. The hoists were supplied with floor-mounted superstructures and umbilical cables for power and control wiring. The system is controlled by a Windows-based computer, and a PLC controls hoist movements.

### THREE OPERATING MODES

Through the interface, the operator selects among three operating modes: automatic, where the PLC controls all hoist activity; semi-automatic, where the operator can send a

hoist to a selected station; and manual, where the operator controls vertical and horizontal motion using arrows on a keypad.

A catwalk remote panel, located at the line's midpoint, enables the operator to switch between modes and control the hoist from the catwalk.

Process steps include nickel seal, three dye options (black, gold and a variable third alternative), etch, desmut, stainless steel passivate and anodize.

The line is served by three rectifiers rated at 3,000 amps at 24 volts. Refrigeration to maintain 70°F ±2°F in the anodize tanks is provided by a system that includes a packaged air-cooled chiller, compressors, chilled water circulation pumps and frame-type heat exchangers. Fumes are exhausted by a 30,000-cfm ventilation system.



The system's two 1,500-lb. capacity programmed hoists are equipped with variable speed transfer motors.

### TURNKEY RESPONSIBILITY

Walgren had turnkey responsibility for engineering and manufacturing the Whimet system. When all modules were complete, the system was set-up in Walgren's Grand Rapids manufacturing facility where "full fit and function were evaluated in detail," according to Chad Whitehead.

Walgren worked with Whimet's utility construction contractor on the installation and assisted with the two-week setup, providing start-up support and commissioning.

"The value of the system was clear from the start," Chad says.

"We can now very competitively anodize the broadest range of medical and non-medical components, while maintaining the highest quality levels and lead times that we know are the shortest in the industry," he says. "What was equally significant, though, was what we learned from this process and the many ways we benefited from not 'over-writing' our specifications."

Those insights were put to work again three years after the anodizing line was installed when Whimet wanted greater capacity and greater automation from its ultrasonic cleaning operation.

"Once again, the goal was to keep variability out of the process," Chad says. "So we went to the equipment company we knew could do the work and added ultrasonics, rather than having an ultrasonic company put equipment around their technology."

### SIX STAGES, 30 MINUTES

The ultrasonic cleaning system engineered by Walgren is six stages and takes about 30 minutes to complete. It includes a hot deionized water rinse, an ultrasonic and conventional rinse, ultrasonic cleaning, alkaline soak clean with eductors, and drying.

The immersible ultrasonic transducers are high-efficiency piezoelectric drivers housed in stainless steel enclosures.

A unique control device developed by Walgren exclusively for hoist operations was an important part of the plan. The Process Control Enhancer simplifies program entry and modification through a keyboard that has clear, simple commands in true “catwalk” language: up, down, forward, reverse, etc.

Multiple users can view the system live.

“With anodizing, we relied on a company that had built those lines many times before, and, as a result, we benefitted from Walgren’s judgments about a hundred or more factors we could never have known about,” Chad says. “Cooling coils, rack carts, tank saddles, load and unload positioning—they knew the performance margins and the safety factors for each because that is what they are about.”

Chad says both the anodize line and the ultrasonic cleaning line are on track to meet their respective five-year ROI targets by early this year. ■

*Information in this story provided by Walgren Co. For information on Whimet, please visit [Whimetinc.com](http://Whimetinc.com). For information on Walgren Co., please visit [Walgren.com](http://Walgren.com)*