

Plating Puts it All Together For Manufacturer of Electrical Components



The 25,000 ft² production area at Penn United is designed for speed and diverse capability.

Starting a plating shop in 1983 was a logical extension to the precision stamping business at Penn United Technology, Inc., Saxonburg, PA. Since then, the plating facility has grown to more than just an arm of the employee-owned company's integration plans. It provides a long list of customers with a source for high-quality plating in the electronics industry, and serves as a drawing card for other services offered by the company.

Penn United Technology, Inc., is a fully integrated manufacturing company serving the electrical connector industry. The company uses tungsten carbide from its facility in Tennessee to build precision tools and "class A" dies to run on 30 presses in its 5,000 ft² press room. The products are plated in a separate 25,000 ft² plating shop, and assembled in an additional parts assembly department.

The reel-to-reel (continuous) plating department was established nine years ago, in the tractor shed of the company president, as part of an initiative to integrate, to gain more control on all processes in the manufacture of electrical components. Starting out with two employees, the

plating shop currently has a staff of 25. Today, the shop continues to plate in-house stamped products, but has expanded over the years so that it now provides services to a long list of outside customers, including AT&T, American Shizuki, Crane Connectors, Osram/Sylvania, and others.

In 1994, the company plated more than a billion connector contacts, and more than 20,000 lb of wire for the electrical connector industry.

Facilities

Penn United's plating department is now operating eight lines, including:

- Three single-strand lines;
- Two four-strand lines;
- One four-strand gold-spot plating line;
- One two-strand wire plating line; and
- One barrel plating line.

The current plating shop has only been in operation since September 1994. A new building was constructed adjacent to the Penn United stamping operation. Dave Miller, plating manager, says that employees and customers were involved in the design from the early planning stages. "Everyone in the department had an

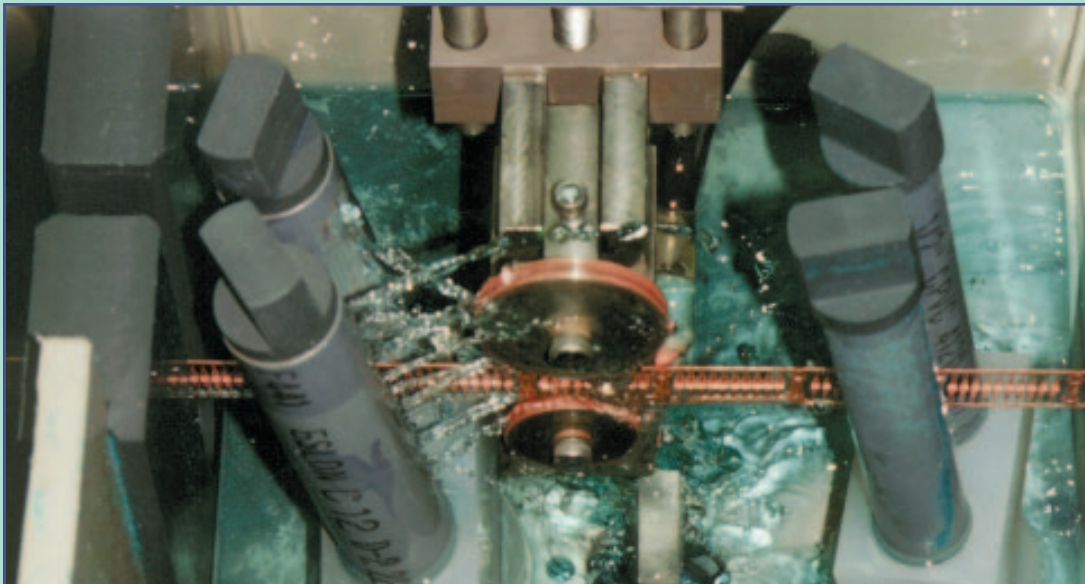
opportunity to make suggestions," Miller said. "Many of our customers also supplied input." The result is a plating shop that is working well for employees and customers.

The building includes a 500-ft² chemistry lab, and a fully equipped quality control room of the same size. As a result of suggestions from customers, a prototype plating room was built with the new building. The prototype line is located in a 600-ft² room adjacent to the chemistry lab. The line, which is almost complete, will consist of a small-scale reel-to-reel and barrel line capable of handling prototype quantities. The feature complements the company's prototype stamping department, and provides the capability for quick turnaround of prototype work and small lot production orders.

"The prototype line is a real advantage for us," Miller said. "It gives our customers a way to test new parts before going to full-scale production."

Processes

Nickel, tin/lead solder and gold are the processes in most demand. Other processes, including copper, tin, palladium and palladium-nickel, are



All plating tooling is produced at Penn United's large tool and die shop. It can be turned out in a single day, if needed.

available. In addition, the company offers electropolishing.

Penn United specializes in plating wire, solid, preblanked and preformed strip and banded connectors. By using spot, stripe, control depth and all-over processes, plating zones are controlled within tolerances of .008 in. on some parts.

The plating department processes lead frames, contacts, terminals, strip stock, wire, and pins. With plating capabilities featuring four-strand, dual-strand and single-strand lines, a large variety of parts can be processed. Most of the plating is performed on copper alloys, cold-rolled steel and stainless steels.

Quality First

Regardless of the product or process, quality is the key to providing customers with acceptable finished parts every time, according to Miller. The company uses state-of-the-art analytical equipment and the latest procedures to help ensure that all parts are of the highest quality. Plating line operators, however, are ultimately responsible for the quality of each reel leaving the plant. "The operator puts a name and employee number, and an accepted sticker, on each reel," said Miller. "That shows the confidence we have in our finished products." There is also an inspector and an auditor working the plating lines 24 hours a day, five days a week, to keep an eye on product quality.

"Our plating department has an advantage in controlling quality by

having the ability to stamp our own product," Miller points out. Many plating problems with electrical components begin in the stamping process, but Miller says Penn United's pressroom personnel are trained to recognize such problems. "They are constantly striving to make a higher quality product." The stamping operation offers its services and experience to outside customers who may have problems with the quality of their incoming parts.

Miller also notes another advantage. Plating quality is only as good as the plating tooling used in the process. At Penn United, selective plating tooling is produced at the company's tool and die shop. The tooling is designed to allow the reel-to-reel lines to selectively plate intricate parts with different process. "With 15 CAD and CAM stations, and 18 engineers to assist with design, we have the equipment, personnel, and experience to produce high-quality plating equipment," said Miller.

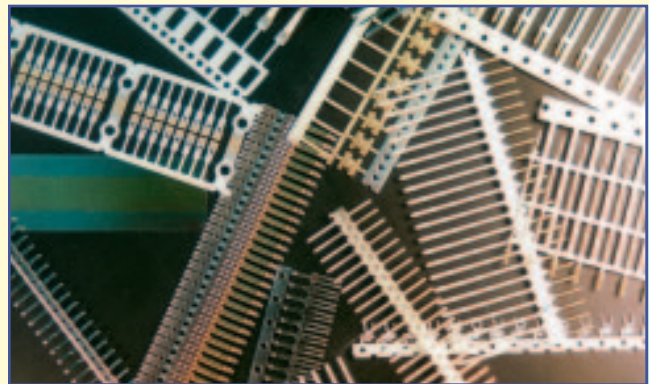
Waste Treatment

The plating shop is a "closed loop" facility. Wastewater gravity-feeds to a 10,000 ft² waste treatment area in the basement of the plant. The wastewater will

be treated on site, and the resulting clean water reused in production. There are no floor drains in the production or waste treatment areas, and the facility is not connected to a sewer system. The shop has zero discharge of wastewater. "We couldn't discharge if we wanted to," Miller says, referring to the lack of a sewer connection. Residual waste collected in the treatment process is shipped off-site to a licensed facility for treatment.

Things to Come

Penn United Technology will continue to expand and strive for even higher quality products in the future, according to Miller. The plating shop was built with the capability to operate 10 lines, and Miller expects to add two additional lines in the near future. When that's done, however, it will not be the end of growth for the plating company. The building was designed for expansion. ○



A variety of product types and finishes are processed on the continuous reel-to-reel equipment.