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BY REGINALD TUCKER

## Recovering Your Metals and Reusing Them, Too

For Ft. Wayne, Ind.-based finisher, novel waste-reduction system makes both economical and environmental sense.

**W**hen Jim McCall was looking to rein in skyrocketing nickel costs at his plating operation—Metal Plate Polishing, Inc., Ft. Wayne, Ind.—he found the perfect solution in a novel metals recovery system. But what McCall also discovered was that there were substantial benefits and additional savings to be had via the system’s capacity to effectively and efficiently reuse those metals.

“We’re recovering anywhere from 350–500 lbs. of nickel every week,” McCall said. “This has cut down on rinses and sludge, and when you’re talking about that much volume per month—that’s a lot of money.”

The system McCall is referring to is supplied by EW Metals, based in Wyandotte, Mich. Billed as a new approach to recovering and reusing process metals, the patent-pending technology developed by company owner, Paul Cook, helps finishers recover drag-out, spent or excess nickel, and copper as usable anode material. Typically, 98.9% pure nickel is recovered for reuse under this system.

Scott Field, technical service rep for EW Metals, describes in a nutshell how the process works: The spent nickel solution or nickel rinse dragout is run through a pre-filtration system. The solution then plates out to nickel starter sheets, which allows the operator to completely reuse this material as anodes in the new system. (Two formats are available: batch & continuous, both of which work on similar principles.)

“What our system also has is a separated cell (separates anode from

cathode solution) so you can have a much higher current density application without dendrite formations and other issues common with older systems without this technology,” Field said. “With the older systems that incorporated steel starter sheets you had problems such as shorting; you weren’t able to recover all the metals as quickly because you couldn’t increase the current density or the amperage. Our system addresses those issues.”

Field also points to advantages over traditional recovery equipment, including ion exchange systems. “Once you run your sulfuric acid through those ion exchange canisters to reclaim the nickel sulfate, you’re probably only getting about 40 ounces per gallon nickel sulfate,” he explained. By comparison, he said the typical liquid recovery is going to be in the vicinity of 80 ounces per gallon. “With ion exchange, you could be getting into a volume situation where you might not be able to add that back into the system.”

### BOTTOM-LINE BENEFITS

The reuse aspect of the EW Metals system has had a direct and positive impact on Metal Plate Polishing’s profit picture.

### Metal Plate Polishing— AT A GLANCE

2413 Meyer Road  
Ft. Wayne, IN 46803  
Phone: (260) 422-5426  
Fax: (260) 423-1492

**Primary customer base/end-use sector:** truck exhaust stacks for big names such as Kenilworth, Mack, Freightliner, Peterbilt, etc.

**Finishing services:** metal polishing, finishing and nickel/trivalent chrome plating; (2) shifts plating; (2) shifts polishing; (12) loading docks. Firm handles several thousand pieces per week with four-tenths of 1% reject rate. Metal Plate Polishing also handles other large orders such as hotel bathroom vanities.

When the finisher first incorporated the recovery system about four years ago, it essentially functioned as a beta test site for the technology. Now, according to McCall, the company is consistently able to reduce its raw nickel purchases by 10%-20%. “That’s more than substantial sav-



Figure 1: Truck exhaust stacks for large freight firms represent the lion’s share of Metal Plate Polishing’s business.

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ings,” McCall said. “We view it as a revenue center.”

For Lee Biddle, plant manager at Metal Plate Polishing, it’s a no-brainer. “If you recycle you might break even; if you recycle *and* recover you’re going to get ahead.”

Another appealing aspect of the EW Metals system is its rapid return on investment (ROI). According to McCall, Metal Plate Polishing was able to begin recouping its investment in the system within the first year of a full implementation. That’s right in line with the typical ROI cycle for the system he selected.

“The typical plater is looking at a first-year payback on a \$60,000 investment,” Field said, citing the 500-lb recovery model (Figure 2). “Our peak system could run upwards of \$100,000, but that’s for finishers with huge amounts of nickel volume. For most people the 12-18 cell system is feasible. From there it’s based on custom requirements and how much you want to recover.”

That payback also applies to the environmental compliance side of Metal Plate Polishing’s business. By using the EW Metals system, the company was able to reduce the overall sludge volume and nickel content in the sludge by 30%-45%. “One could

possibly drop that number down even further with modifications to the system, such as through rinsing and return of material through dragout,” Field added.

Yet another feature of the EW Metals system is the addition of a fume “scrubber” component, which destroys the chlorine gases produced in the plating process and converts it to sodium chloride (salt water). Plus, according to Field, you don’t need as much water in the system because there’s less metals coming through.

(Less nickel going over chrome means less impact down the line. Hence the dramatic reduction in the amount of water used for rinses.)

“It’s very economical compared to ion exchange systems, it’s easy to operate, and it features automatic pH adjustments,” Field explained. “The only time you have to do something is when you pull out those plates. The main hurdle is getting people beyond the initial investments, but there are ways to mitigate those costs.” (See sidebar on “Incentives to Invest.”)

## CONCLUSION

The rate of ROI on the EW Metals system will vary according to a particular finisher’s overall plating capacity and the specific recovery system installed. However, all EW Metals systems—regardless of system capacity—offer the following benefits:

1. no dendrite formation, which eliminates shorting
2. high current density operation for faster recovery of nickel metal
3. economical recovery value well below other forms of recovery



Figure 2: The rate of ROI on the EW Metals system will vary according to a particular finisher’s overall plating capacity and the specific recovery system installed. The version shown here is a 500-lb. unit.

4. lower initial investment vs. other types of recovery

5. very fast return on investment

While nickel and copper are most ideal metals for which the EW system is designed, it can be used with other materials. These include palladium, gold, and precious metals, to name a few. The company also reports success with electroless nickel recovery. “The only issue with electroless nickel is the amount you might recover is so small that your return on investment would be much longer,” Field said. In addition, the system is designed to recover metals out of stripping solutions, thereby addressing another waste stream.

EW Metals is part of a family of companies covering: plating/finishing; chemicals (Benchmark, Inc.); recycling equipment and chemistries (Clear Solutions); and metals recovery.

For more information, call (313) 655-5840 or write to EW Metals at 4660 13th Street, Wyandotte, MI, 48192. For information on Clear Solutions, call (734) 934-9127 or visit [www.clearsol.us](http://www.clearsol.us).

## Incentives to Invest in Pollution Prevention

To help finishers defray costs, small business loans (P2) are available from some states that offer industrial operations an economic incentive to invest in pollution prevention. The P2 program provides low-interest loans for small businesses that implement sound environmental projects that reduce, re-use, or recycle environmental waste generation, energy used, or hazards to public health. (Processing takes 90 days.) For more information, finishers are encouraged to contact their local or state Department of Environmental Quality.