



## Coating Technology: Metal Finishing Plant Implements 100% of Recommendations

ASSESSMENT DATE: NOVEMBER 13, 2002

### BENEFITS:

- Identified potential annual energy cost savings of \$29,357
- Recommendations will reduce total energy usage by 11.7% per year
- Overall simple payback will be seen in less than 5 months
- All 5 recommendations were implemented to reduce energy usage and minimize waste

### APPLICATIONS:

"I found the study from Syracuse University to be thorough and extremely helpful in reducing utility costs. I highly recommend the service to other western New York companies"

- Stan Dahl, Coatings Tech

### Summary

The assistance of Syracuse University's Industrial Assessment Center was solicited to perform an energy assessment at the Coating Technology plant in Rochester, NY. Opportunities for saving electricity were identified through the control of energy consumption in the compressed air system. Ideas for saving energy involved reducing the compressed air pressure, and limiting lost air. Also, the facility can minimize hazardous waste by treating with chemicals on-site and further reduce energy consumption by installing insulation and energy efficient lighting. The assessment team concluded that the implementation of these assessment recommendations would result in savings of over \$29,000. Further results from this assessment are highlighted throughout the case study.

### Company Background

A team of faculty, staff and students from Syracuse University's Industrial Assessment Center performed an assessment of a metal finisher in the fall of 2002. The assessment was led by Center Director and Professional Engineer, Frederick J. Carranti.

### Assessment Approach

The metal finishing company considered is a contract plating shop situated in a single 38,000 square foot building. The process includes various cleansing, rinsing, bathing in solution and electroless nickel, and air drying of metals prior to shipping. The total energy budget for the plant is approximately \$142,400 per year, the bulk of which is electricity usage and the remainder natural gas consumption

### Waste Minimization

Within the company's finishing process, incoming metal must be exposed to a weak acid solution. After 2-3 weeks of use, the dirty acid needed to be properly disposed of, resulting in expensive disposal and treatment costs. Looking to reduce the facility's amount of hazardous waste material, the assessment team recommended adding to its current solution a new chemical, PRO-phX, which would extend the life of the acid bath indefinitely. By keeping the acid clean, the plant's hazardous liquid waste would decrease by 6,800 gallons each year with an associated cost savings of \$21,400



## Compressed Air Systems

Compressed air requires significant amounts of energy to operate, subsequently resulting in higher costs. The following measures, both of which were implemented by the company, can be taken to ensure reduced energy usage and more efficient operations:

- The team found that the facility's 6 drying stations were losing substantial air through the ¼ inch outlets on its compressed air hoses. Installing air nozzles on each hose would minimize the amount of compressed air necessary to achieve desired drying and would reduce electrical consumption by 22,556 kWh per year and save \$1,534.
- Reducing the pressure of the facility's compressors from 150 psi to a lower setpoint of 100 psi would save approximately 7,700 kWh and \$1,047 annually, with an immediate payback.

## Additional Energy Conservation Measures

Two other areas recognized by the team as targets for energy savings were lighting and insulation. The plant's lighting consisted of T-12 fluorescent lamps connected to the building's original magnetic ballasts, which were over 30 years old. Replacing these with new electronic ballasts and energy efficient T-8 lamps would save the facility 22,658 kWh and \$3,080 each year. Lastly, insulating the facility's numerous heated dip tanks would reduce the heat loss through convection and radiation by 439 MMBtu per year, saving nearly \$2,300.

## Results

Table 1 shows the annual cost savings to accrue at the facility by implementing the energy conservation and waste minimization opportunities identified during the assessment. Based on these results, the facility can reduce its energy usage by over 980 MMBtu. These reductions will consequently reduce natural gas, electrical usage, and electrical demand costs by a total of \$29,357.

## Projects Identified

Opportunities for reducing energy consumption that were identified during the assessment are described in the following table:

**Table 1. Opportunities at Coating Technology's Rochester Facility**

| Recommended Action                             | Annual Resource Savings | Annual Cost Savings (\$) | Implementation Cost (\$) | Payback (months) |
|--|-------------------------|--------------------------|--------------------------|------------------|
| Use Acid Life Extender for All Plating Tanks   | 0 MMBtu/yr              | \$21,400                 | \$1,800                  | 5                |
| Replace T-12 Fluorescent Lighting              | 232 MMBtu/yr            | 3,081                    | \$8,364                  | 3                |
| Insulate Plating Tanks                         | 439 MMBtu/yr            | \$2,283                  | \$995                    |                  |
| Discontinue Inappropriate Compressed Air Usage | 231 MMBtu/yr            | \$1,534                  | \$327                    | 2                |
| Reduce Compressed Air Pressure                 | 82 MMBtu/yr             | \$1,059                  | \$0                      | 0                |
| <b>Totals</b>                                  | <b>984 MMBTU/yr</b>     | <b>\$29,357</b>          | <b>\$11,486</b>          | <b>4</b>         |

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