

# Independent Plating Inc.

Tri-Chrome Installation

# Motivation

- ◎ Customer Requests
  - > 'Greening' of the supply chain
- ◎ Creating a Niche For Future Markets
- ◎ New Regulations
  - > Globalization of Regulations – ELV, RoHS, REACH
- ◎ Employee Safety

# Decision Process

## ◎ Research

- Coverage, Color, Ease of Maintenance, Level of Support From Vendor
- Could the system achieve the thickness levels and corrosion resistance required
- Pros and Cons of various tri-chrome systems & chemical makeup's
- Visited other tri-chrome plating shops

# Anticipated Costs & Benefits

|                                 | Tri-Chrome                | Hex-Chrome              |
|---------------------------------|---------------------------|-------------------------|
| Chromic Acid (oz/gal)           | 1.15                      | 30.73                   |
| Current                         | 50 ASF                    | 150 ASF                 |
| Temperature                     | 116°F                     | 105°F                   |
| Plating Time Per Part           | 3-5 minutes               | 1 minute                |
| <b>Treatment Chemical Costs</b> |                           |                         |
| Sodium Metabisulfite            | N/A                       | \$0.55/lb               |
| Sodium Hydroxide                | N/A                       | \$0.55/lb               |
| <b>Plating Chemical Costs</b>   |                           |                         |
| Chromic Acid                    |                           | \$2.19/lb               |
| Chrome Catalyst                 | \$15.50/gal               |                         |
| Tri-Chrome Additive #1          | \$3.25/lb                 |                         |
| Tri-Chrome Additive #2          | \$35.50/gal               |                         |
| Tri-Chrome Base Salts           | \$37.00/gal               |                         |
| Tri-Chrome Wetter               | \$23.50/gal               |                         |
| Boric Acid                      | \$0.89/lb                 | \$0.89/lb               |
| Hydrogen Peroxide               | \$5.61/gal                | \$5.61/gal              |
| <b>Equipment Maintenance</b>    |                           |                         |
| Anode Replacement               | 18-24 months - \$34,000   | 40 + years – Lead Based |
| Filter Cartridge Replacement    | Every 2 weeks - \$1000/yr | N/A                     |

# Technical Specifications

- ⦿ Chemistry
- ⦿ Anode specifications
- ⦿ Tank Configuration
- ⦿ Process Changes

# Chemistry

Payco will be covering this  
later in the presentation

# Anode Specifications

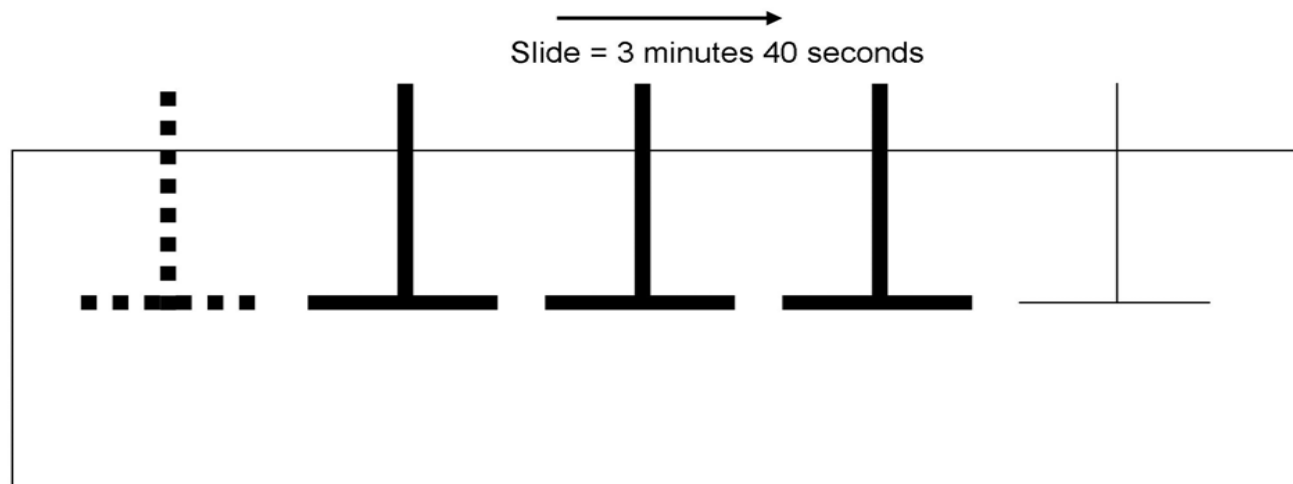
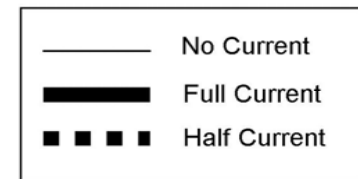
- ◎ Iridium Coated Titanium versus Lead
  - › Lead anodes require continual maintenance and additional waste treatment
  - › Cross contamination can occur with lead anodes
  - › Iridium coated anodes are virtually maintenance free
- ◎ Recommend 20 grams of Iridium per meter
  - › This prevents Hexavalent Chrome build up in bath
- ◎ Dimensionally stable

# Tank Configuration

Figure 1.1

## Tri-Chrome Tank

- 5 Arms in tank (3.5 under current)
- 20' square feet per rack = 21.7sq ft anode area per station
- Each station is 44" x 64" x 2" sides
- 24 anodes 6" x 65" staggered, plus hook

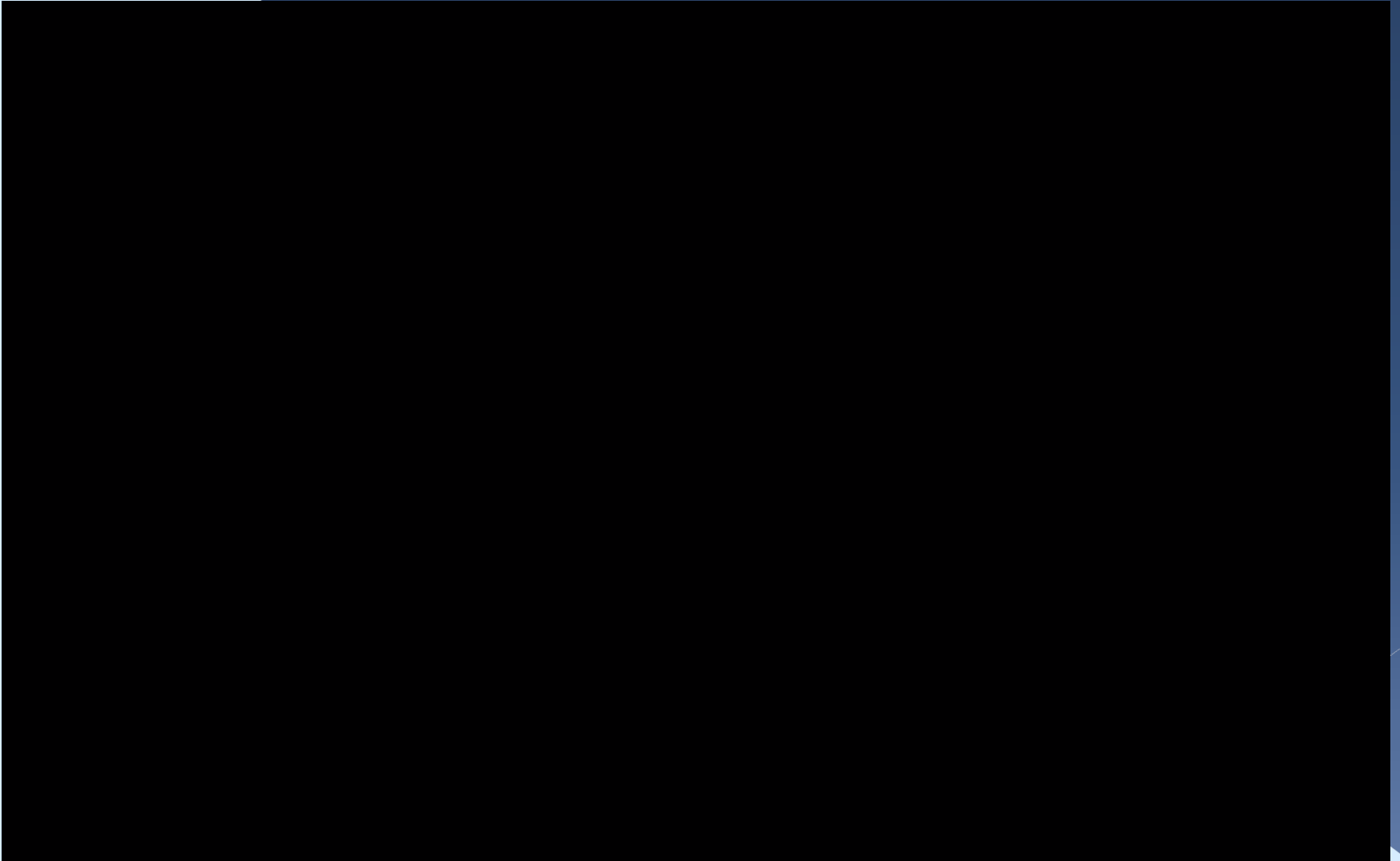


18' 9" Long  
53" x 72" Tank Area

3,500 Gallons  
Filter 7,000 GPH



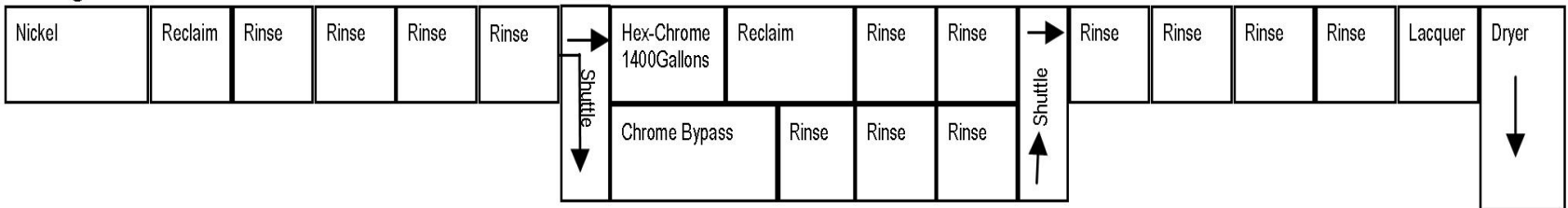
# Tank Fabrication & Installation



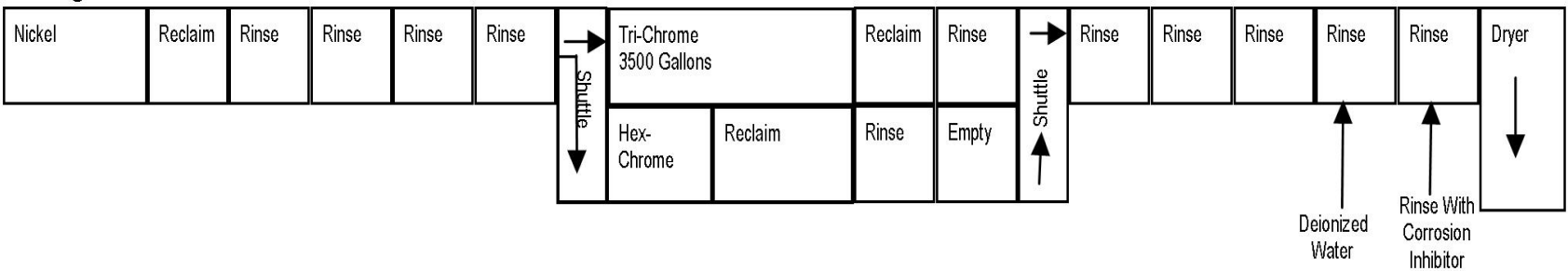
# Process Design Changes

Figure 1.2

## Plating Line Before Installation of Tri-Chrome



## Plating Line After Tri-Chrome Installation



# Status of Project/Next Steps

- Tri-Chrome system setup is complete
- Next Steps
  - > Testing/Debugging
  - > Training

# Any Questions?

Please join us at our facility at the End of  
May for an on-site demonstration.

Visit [www.turi.org](http://www.turi.org) for more information