

# Water and Chemical Reduction at Co-operative Plating

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UNIVERSITY OF MINNESOTA

**Driven to Discover<sup>SM</sup>**

# Company Background

Co-operative Plating – St. Paul MN

- 39,000 square foot facility
- 18 finishing lines ranging from anodize to zinc nickel on various metals
- 125 employees



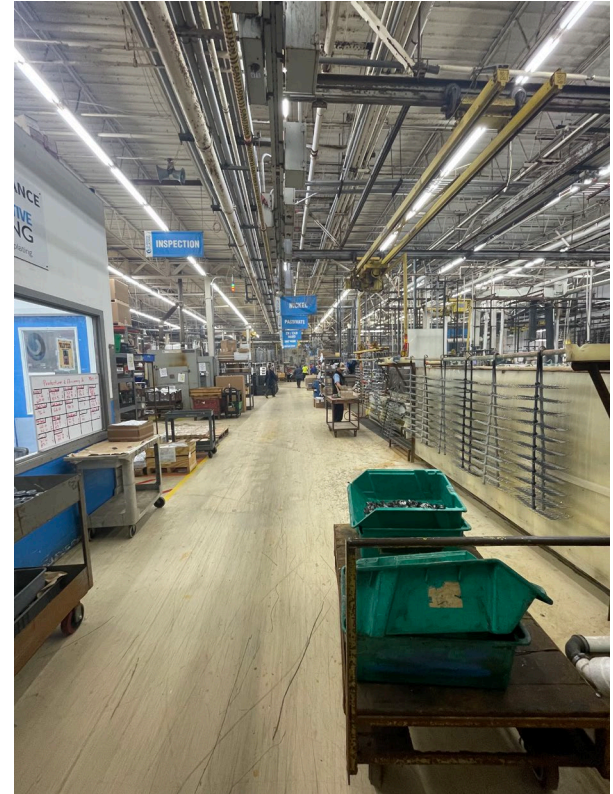
Top Quality, On Time



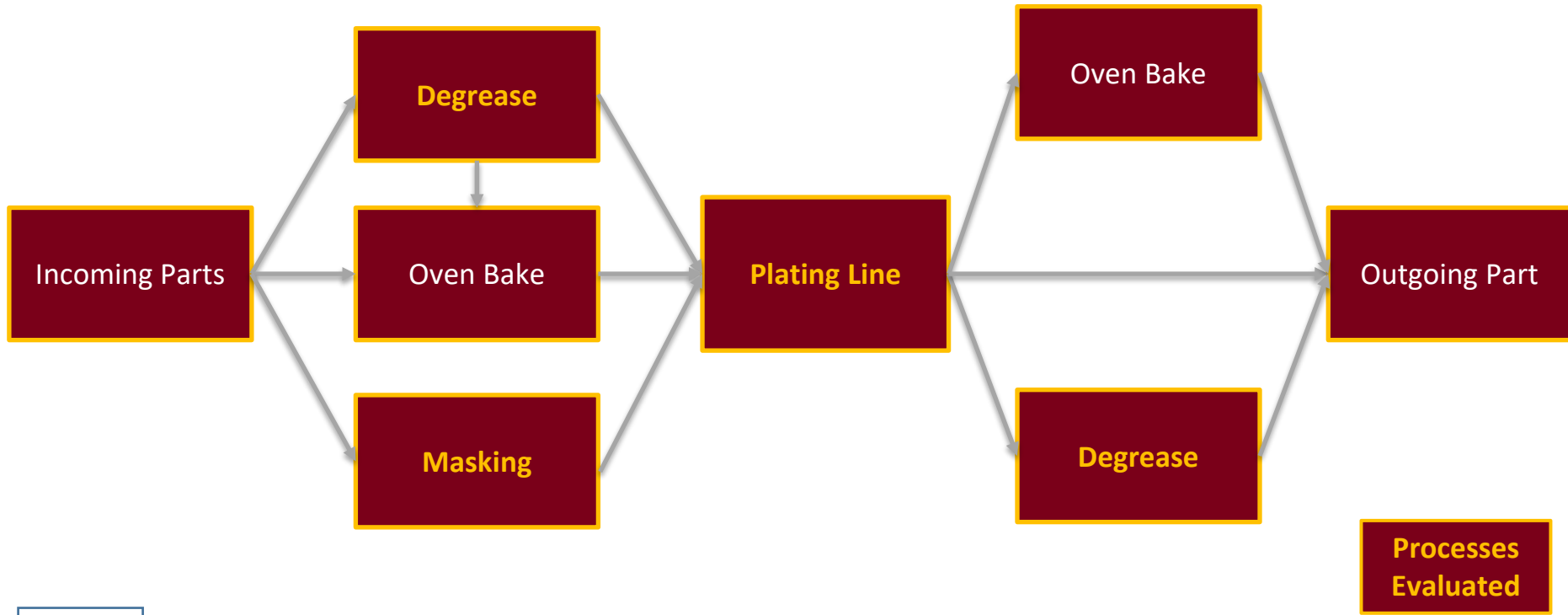
# Incentives to Change

- Resource Savings
- Cost Savings
- Employee Safety
- Line Efficiency

**“We take pride in providing top quality, on-time plating services while respecting the environment.”**



# Plating Process



# Replacement of the Vapor Degreaser

- Co-operative uses a vapor degreaser to:
  - Cleaning greasy/oily parts
  - Removing lacquer from masked parts
- Solvent used: N-Propyl Bromide (nPB)
  - Hazardous Air Pollutants (HAP) by the EPA
- Annual Cost
  - 14,560 lbs. of nPB
  - 405,000 gallons of water, 92 therms
  - \$65,400 yearly



# Solution: Aqueous based Cleaning System

## ALMCO Immersion Parts Washer

- Initial Installation Expense: \$72,000
- Annual Operational Cost: \$3,900
- Chemical Used : Aqua Vantage® 815 QR-NF aqueous detergent
- Utilizes 78 lbs. of chemicals and 1170 gallons of water per year
- Payback Period: 1.2 years



# Savings Overview

- Cost: \$60,500 ↓
- Chemical: 14,400 lbs. ↓
- Water: 224,000 gal. ↓
- Energy: 6,600 kWh ↑



# Solution: Switch to an Unheated Solvent

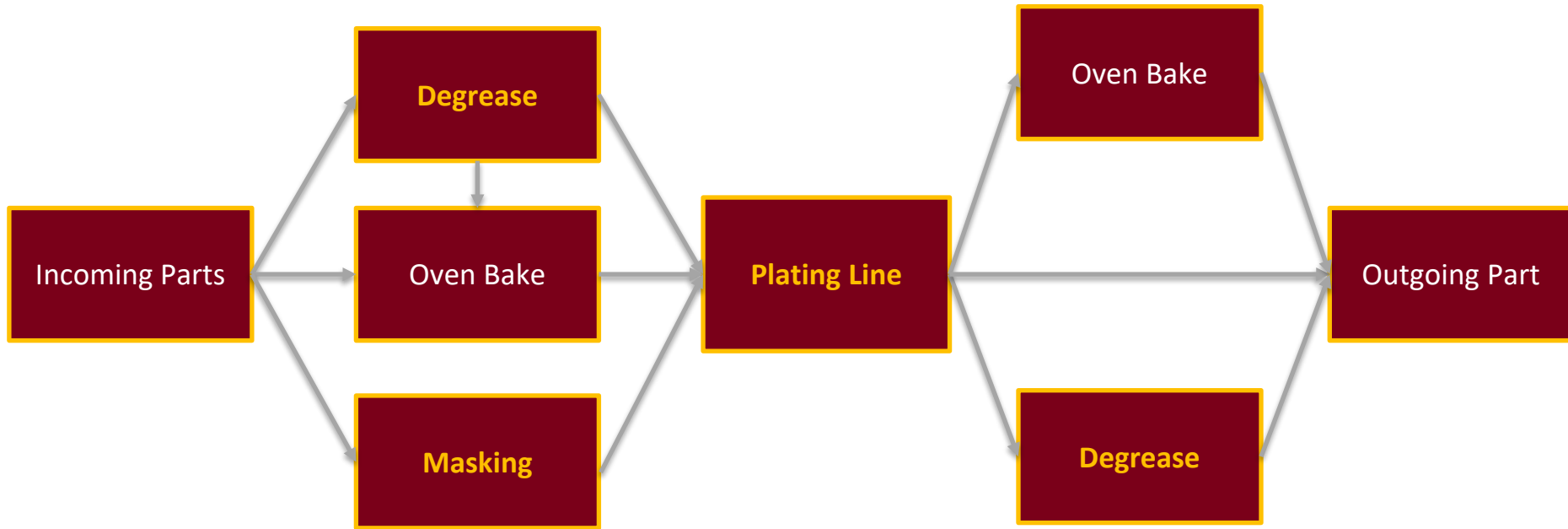
## Removing Masking Lacquer

- Transition to Acetone (100%) within a compact, covered, and non-heated tank
- Developing a testing protocol for a peelable stop-off lacquer

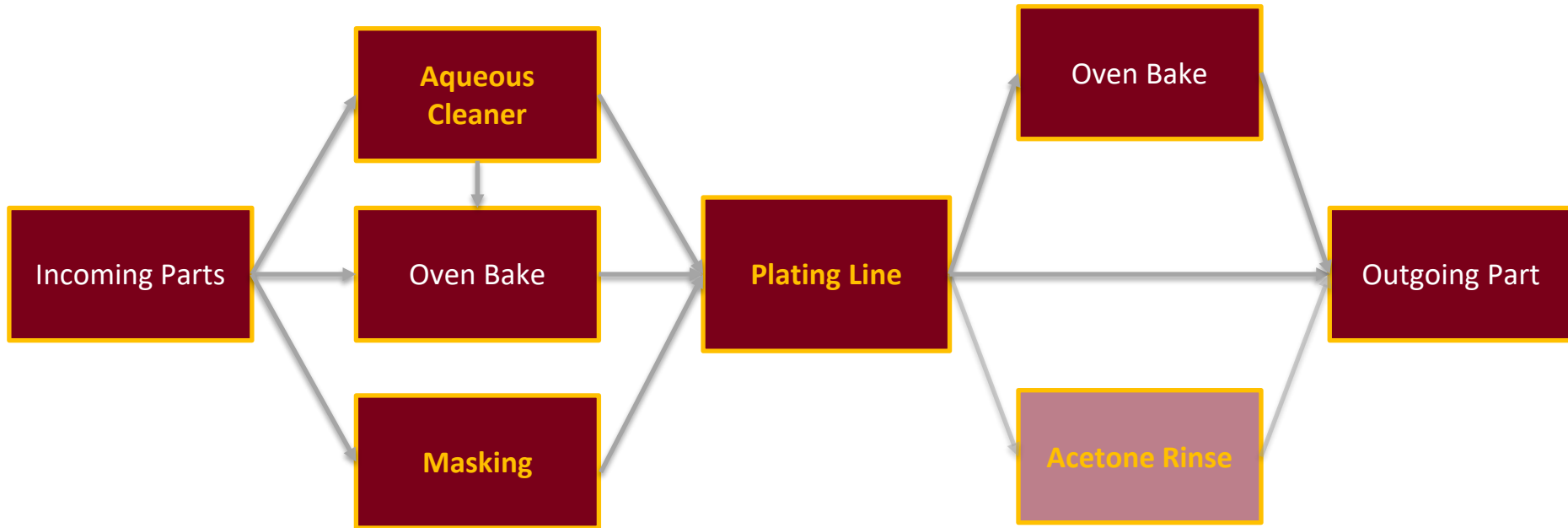




# Plating Process (Before)



# Plating Process (After)



# Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Switch to Aqueous Based Cleaning Solution	14,560 lbs nPB 225,000 gal water	\$75,000	\$60,500	1.2 years	Recommended
Insulate Exposed Steam Pipes	11,330 therms	\$4,800	\$11,500	0.4 years	Recommended
Increased Drain Times	6,370 lbs chemicals 780 gal water	\$0	\$9,300	NA	Recommended
Address Compressed Air Leaks	30,000 kWh	\$410	\$3,950	0.1 years	Implemented

# Personal Benefits

- Gained project management experience
- Introduced to manufacturing processes
- Collaborated closely with vendor and employees
- Discovered demanding yet rewarding savings projects

