

Electrode Consumption Reduction

Reducing Electrode Costs While Improving Your ESG Score

As steel producers manage headwinds associated with increased electrode pricing for electric arc furnace (EAF) and ladle metallurgy facility (LMF) operations, they are tasked with reducing their carbon footprint while increasing plant throughput capacity. ChemTreat's Primary Metals team and dedicated R&D scientists have developed an exciting solution to help our clients address these challenges.

Our innovative and patented Electrode Consumption Reduction (ECR®) technology uses the novel process of applying an antioxidant barrier to the electrode surface while the furnace is in operation.

ECR® is an automated way to extend electrode life while simultaneously improving production throughput and reducing greenhouse gas emissions.


How the Technology Works

ChemTreat's ECR® process is continuously applied to the spray water system and distributed on the electrode surface via the spray ring. As the water evaporates, a visible protective barrier is formed on the electrode surface.

This patented process not only provides a protective barrier above the furnace delta, but also delivers further oxidation protection as the electrode penetrates the furnace. Once inside the furnace, the oxidation barrier becomes molten, extending protection down the electrode, and ultimately reducing the associated red length.

The program is controlled with automation engineered to provide the following benefits:

- **A process control package designed to handle the harsh conditions surrounding the furnace**
- **Flow-based proportional control of chemical feed**
- **Redundant pump lockout during no-flow periods**
- **Inventory monitoring and trending**
- **Chemical feed verification and automatic alarming**
- **Automatic trend reporting through our CTVista®+ intelligent water management platform**



Your experienced ChemTreat Primary Metals team will customize the program for each furnace at your facility. The program design will be based on the furnace operation, specific spray water chemistry, related equipment, and the associated heat flux.

All sites are different; results may vary.

CUSTOMER RESULTS

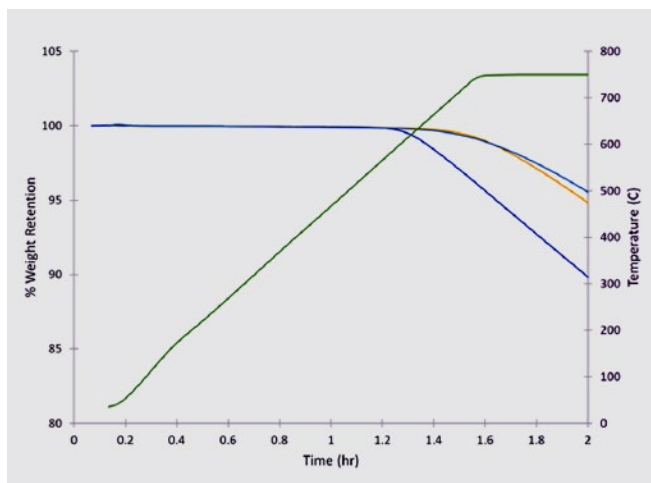
Facilities who are currently using this technology have seen the following annualized results per furnace:

- **9.8% average reduction in electrode consumption**
- **Average of 500–1,200 tons of CO₂ per furnace eliminated annually**
- **Increased plant throughput capacity by reducing electrode add time**

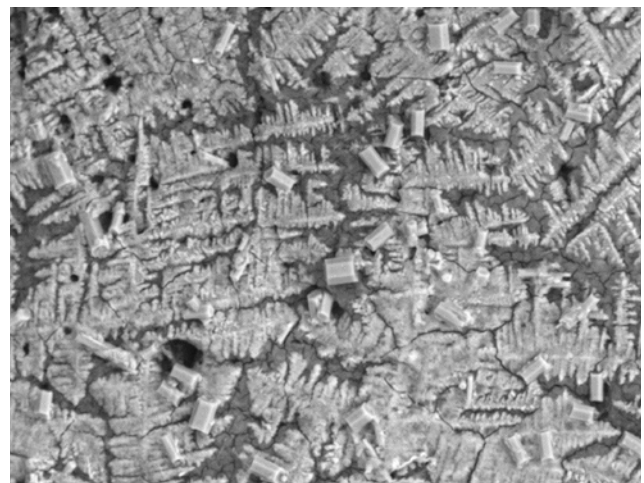
All savings information is calculated and captured in the ECR® Calculator within ChemTreat's CTVista®+ platform.



ECR® program in service with visible spray water pattern



R&D thermogravimetric analysis of product evaluations



Scanning Electron Microscope evaluation of the protective barrier formed by ECR® application