CASE STUDY

Major North American EAF Steel Producer Cuts Electrode Consumption by 18% with ChemTreat's ECR® Technology

Background

Electrodes typically represent 10–15% of total production costs for electric arc furnace (EAF) steelmakers. For large producers, even small improvements in electrode performance can generate substantial cost savings. They can also yield operational benefits, such as:

- Reduced greenhouse gas emissions
- Increased crane availability
- Improved furnace uptime

A leading North American EAF steel producer sought to reduce electrode spend while simultaneously improving operational efficiency at their mill.

To achieve these goals, the producer partnered with ChemTreat to deploy our patented Electrode Consumption Reduction (ECR®) technology. ECR uses a proprietary chemistry **applied to the electrode spray-cooling water** to create a protective barrier that helps reduce electrode oxidation.

Solution

1. Comprehensive EAF and Electrode Audit

ChemTreat's Primary Metals team began by performing a detailed assessment of the EAF operation and electrode cooling system. This enabled them to develop a program precisely tailored to the water quality and unique operating conditions at the mill.

2. Advanced Automation & System Integration

The customized ECR program was managed through a rugged, state-of-the-art automation package, featuring:

- Flow-based proportional chemical control
- Automated inventory monitoring
- Chemical feed verification
- Real-time spray-water flow monitoring

This system was engineered to withstand the harsh environment surrounding EAF operations.

3. ECR Application

Once deployed, the ECR chemistry was applied through each phase of the spray water, passing through the spray ring to form a visible protective coating.

As the electrode enters the furnace, the barrier becomes molten and continues protecting the electrode further down its length, effectively reducing sidewall oxidation. The barrier forms a white or gray protective coating, clearly visible after application.

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Untreated electrodes

Electrodes treated with ECR

Results

ECR had a significant impact on the facility's operations:

18% reduction in electrode consumption

$1.8M in approximate annual electrode savings

10 extra hours of EAF availability per year

$1.04M in approximate additional revenue thanks to improved EAF availability

1,450 tons of CO_2 eliminated annually, supporting the customer's sustainability goals

Adopting ChemTreat's patented ECR technology helped the steel producer achieve a powerful combination of

cost savings, operational efficiency gains, and environmental benefits.

The ECR program's proven performance demonstrates how strategic chemical innovation can deliver meaningful value across EAF steelmaking operations.

Results are examples only. They are not guaranteed. Actual results may vary.

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