

ENGINEERED SOLUTIONS

CASE STUDY

Overcoming Emissions Challenges:
A Cradle to Grave Solution for a Global Process
Manufacturer's Combustion Challenges



A FAMILY OF COMPANIES





INTRODUCTION

Existing line burners used for preheating flue gas in the selective catalytic reduction (SCR) process, were causing reliability issues and leading to non-compliance with emissions permits.

A global leader in carbon emission reduction technologies, high performance catalysts and proprietary technology for the chemical and refining industries, faced a significant challenge in meeting emissions requirements. Their existing line burners, used for preheating flue gas in the selective catalytic reduction (SCR) process, were causing reliability issues and leading to non-compliance with emissions permits. To address this problem using a consultative approach, Relevant Industrial developed an innovative and comprehensive solution that would enhance combustion efficiency and ensure compliance with environmental regulations.

Their existing line burners, used for preheating flue gas in the selective catalytic reduction (SCR) process, were causing reliability issues and leading to non-compliance with emissions permits.



CHALLENGES & OBJECTIVES

1

Fulfill Emissions
Requirements

2

Inability to
Consistently
Support Combustion

3

Design a Reliable
NOx Burner
System

01 FULFILL EMISSIONS REQUIREMENTS

The process manufacturer's primary challenge was to fulfill emissions requirements by providing the necessary make-up heat for the SCR process.

02 INABILITY TO CONSISTENTLY SUPPORT COMBUSTION

The existing line burners were unable to consistently support combustion due to changes in the flue gas stream's O₂ composition. This resulted in frequent flame outs, nuisance trips, and reduced efficiency.

03 DESIGN A RELIABLE NO_x BURNER SYSTEM

The objective was to design a reliable and low NO_x burner system that would deliver the required make-up heat, maintain a stable flame, and ensure emissions compliance.

SOLUTION IMPLEMENTATION

1

Proposed a
Corner-Fired
Solution

2

Mounting a
Kinedizer LE Burner

3

Fuel Gas Train,
Blower, and a
Control Panel with
Smarlink MRV

Relevant Industrial engaged in critical discussions, site visits to collaborate with the manufacturer's engineering team to develop an innovative and cost-effective solution:

01 PROPOSED A CORNER-FIRED SOLUTION

In close collaboration with their engineering team, Relevant proposed a corner-fired solution to address the combustion challenges.

02 MOUNTING A KINEDIZER LE BURNER

This alternative burner installation involved mounting a Kinedizer LE burner externally to the flue gas stream burner strategically in an elbow of the flue gas duct. This way the burner remained unaffected by changes in the flue gas stream's oxygen levels, providing its own combustion air and eliminating reliance on the fluctuating O₂ levels in the flue gas.

03 FUEL GAS TRAIN, BLOWER, AND A CONTROL PANEL WITH SMARLINK MRV

The proposed design included a fuel gas train, blower, and a control panel with Smarlink MRV for comprehensive combustion control.



RESULTS & BENEFITS

1

Enhanced Combustion Reliability

2

Consistent Make-Up Heat

3

Flexibility in the Manufacturer's Processes

01 ENHANCED COMBUSTION RELIABILITY

The implementation of the corner-fired burner system resulted in enhanced combustion reliability and improved emissions control.

02 CONSISTENT MAKE-UP HEAT

By eliminating the dependency on the flue gas composition and providing a separate combustion air supply, the solution provided consistent make-up heat, allowing the SCR to effectively reduce NOx and CO levels and comply with emissions requirements.

03 FLEXIBILITY IN THE MANUFACTURER'S PROCESSES

The solution offered flexibility in the manufacturer's processes, minimizing downtime, fines, and potential plant shutdowns. This successful project not only resolved the combustion challenges but also established Relevant Industrial as a trusted partner and subject matter expert in combustion solutions.



CONCLUSION

The collaboration between Relevant Industrial and the process manufacturer led to the successful resolution of the combustion challenges faced by the company. By implementing the corner-fired burner system, the manufacturer achieved improved combustion reliability, emissions control, and compliance with environmental regulations. The consultative approach, from initial proposal to the execution of the project, showcased Relevant Industrial's expertise and commitment to delivering comprehensive solutions for its customers. This project served as a testament to Relevant Industrial's ability to provide innovative and tailored combustion solutions for complex industrial processes.



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