



CASE STUDY

#1112-2025

VISION[®] burner retrofit saves millions of dollars



THE CHALLENGE:

A large American food and beverage ingredient provider based in Westchester, Illinois was experiencing significant high emissions issues from their gluten dryer system. The primary concern was extremely high CO emissions, measured at over two thousand percent (2000%) above permitted limits.

They also had very stringent NOx emission limits and did not have any margin. The client reached out to evaluate the feasibility of implementing a CO catalyst system. As an alternative, they wanted to explore installing a thermal oxidizer system to reduce CO along with an SCR system to reduce NOx.

THE SOLUTION:



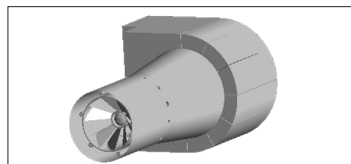
After a thorough review, we determined that neither a CO catalyst nor an SCR system was viable because of the low stack temperatures and the cost and time required. Instead, we proposed retrofitting the burner with advanced premix combustion technology to significantly reduce emissions. The existing system used a conventional diffusion flame burner, which produced higher CO emissions due to poor combustion.

To validate the proposed solution, we conducted detailed CFD (Computational Fluid Dynamics) study to optimize the burner performance and furnace design. To validate CFD results, we designed and fabricated a full-scale prototype of the burner and furnace for in-house testing. This allowed us to fully validate actual operating conditions and ensure performance guarantees would be met prior to field implementation.

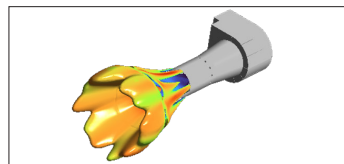
THE RESULTS:

In-house testing validated CFD results and field results with the new burner design significantly exceeded expectations. CO emissions measured were 71% lower and NOx emissions were 66% below guaranteed emissions,

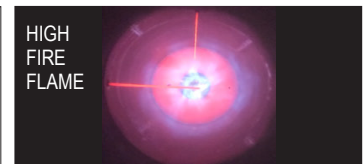
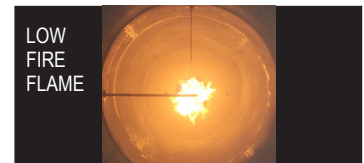
	NOx, PPH	CO, PPH
Emission as found	0.87	70.99
Emission Guarantee	1.04	2.07
Emission after Retrofit	0.35	0.59



Burner used in both experiments and CFD simulations



Representation of flame from CFD simulations



Experimental flame for low fire and high fire, respectivity

