



Sterilization Facility Cuts ETO Emissions and Operating Costs Using Enhanced Recuperative Catalytic Oxidizer

THE ISSUE

A production increase at an existing ethylene oxide (EtO) sterilization facility in northern Texas triggered unexpected air compliance issues that needed to be resolved within a very limited time frame. Because of this, the facility was urgently seeking a permanent solution that would meet a specific Volatile Organic Compound (VOC) destruction efficiency and have high on-stream time with low operating and maintenance costs. Proposals from four different vendors were considered but did not meet their overall objectives for energy consumption, timing and credibility. Pollution Systems was approached to consider the project scope and recommend an alternative solution for the facility's surge in emission composition.

THE SOLUTION

After carefully reviewing the process application and balancing initial investment against the ongoing operating cost, Pollution Systems recommended the installation of a Recuperative Catalytic Oxidizer. Because particulate and catalyst poisons were not present in the facility's airstream and the concentration of VOCs was below 25% Lower Explosive Limit (LEL), the Recuperative Catalytic Oxidizer was most appropriate for the facility's process application. Since the time frame was compressed to meet air permit regulations, Pollution Systems provided expedited turnaround at every project stage until operators felt more at ease, including an immediate onsite visit to conduct a thorough process review and frequent follow-up meetings within the limited timeframe to discuss technical recommendations.

THE DECIDING FACTOR

Pollution Systems ultimately designed the Recuperative Catalytic Oxidizer Model RCO-14 using an engineered catalyst that achieves results at lower temperatures, thereby significantly reducing operating cost. Pollution Systems catalytic oxidizer efficiently met the facility's high treatment requirement with a low maintenance, highly reliable system. As timing was a consideration, Pollution Systems was proactive in project planning to meet the aggressive timeline while quickly responding to any questions and concerns. The Recuperative Catalytic Oxidizer was quickly commissioned for the ethylene oxide facility to meet a minimum VOC destruction efficiency greater than 99%.

THE BENEFIT

With the VOC destruction efficiency met, low overall operating costs remained a priority. Since oxidation of the VOCs occurs at a much lower temperature when using a catalyst, the temperatures utilized translated into significantly lower operating costs for the ethylene oxide facility. The low temperatures also allowed for cost-effective construction materials and improved equipment life due to less thermal expansion/contraction during shutdown and startup operations. Additionally, lower gas usage meant that less carbon dioxide and NOx were being generated to destroy the VOCs.

The sterilization company was extremely pleased with the outcome of their new equipment. Since then, they have actively commissioned inspections of the air pollution-abatement systems used in their other facilities nationwide and abroad to see if the same efficiency in operations could be achieved. New equipment by Pollution Systems has now been installed in several more of their existing plants to date and plans for more are underway to meet the increasingly stringent ETO regulations across the nation.

