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Applicationbrief

Eclipse Product: Vortometric Burners with FGR

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Application: Thermal Oxidizer

Description: Met-Pro's System Division used a 32V-MI Vortometric burner incorporating Flue Gas Recirculation (FGR) to retrofit an existing thermal oxidizer (TO) to meet Minnesota State "minor source emissions" requirements. The existing system wouldn't meet those requirements for CO, VOC, and NOx. The system also includes a heat recovery steam generator and 16V MI and 20V MI on the last two zones of the dryer used in the corn to ethanol industry and were retrofitted with FGR.

Met-Pro was hired to provide an engineering study and make recommendations to meet the existing system and minimize fuel consumption. After reviewing the recommendations and use of computational fluid design (CDF) with ALCORN management, Met-Pro was hired to institute the changes.

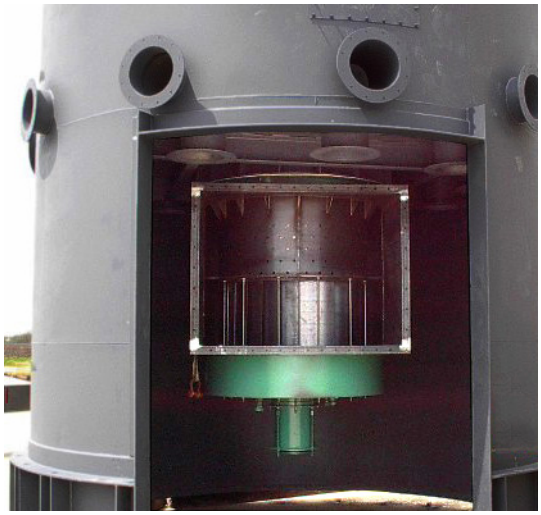
Met-Pro contacted Eclipse because of a long standing business relationship between the two companies. That in itself was not a guarantee we would receive the order as they were also looking at a competitor's design to meet their specifications. Because the previous design required a higher operating temperature, the existing TO had an Eclipse 36V Vortometric burner. To address the emission requirements, we discussed FGR. However Met-Pro was new to the ethanol industry and had a lot of questions. We made arrangements to have John Stanley, Market Manager for Ethanol Industry to meet with Met-Pro principles at the Eclipse Norristown Office to discuss concerns, build confidence and review design concepts. John's professional approach and candid guidance was instrumental in having them look seriously at Eclipse as their burner choice.

New Thermal Oxidizer

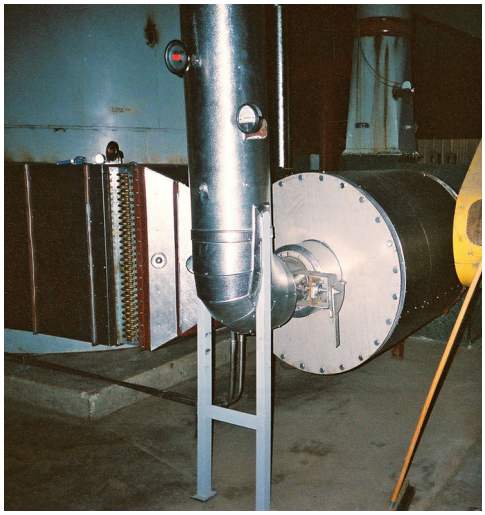
Met-Pro recognized Eclipse's commitment to support efforts in the ethanol industry. John continued to support our efforts throughout the order and manufacturing process. Met-Pro also hired Eclipse Global service to provide startup assistance when the project was commissioned. Eclipse Sales is a team approach with the assistance of our product managers and their staff. The Eclipse manufacturing team's desire to meet production requirements keeps the customer and sales on the same page. As companies expand to other industries or new applications Eclipse appears to be in the forefront of emerging technologies.

The results of using the Vortometric burners with FGR in the dryer reduced the emissions going to the TO. On the TO, by adding FGR and smaller 32 V, redesigning the chamber to allow better mixing and 1 second retention time, the emissions where greatly improved. The results are listed below.

Emissions	Minor Source Limit	Consent Decree Limit	Actual Emissions
CO	100 tons/year	70 tons/year 15.8 pound/hr	62.8 tons/year (55 ppm by volume) 14.6 pounds/hr.
VOC's	95% destruction 100 tons/year	95% destruction 1.5 pounds/hr.	99.8 % destruction 0.11 pounds/hr.
NOx	100 tons/year	20.5 tons/year 0.040 pounds/million Btu	16.4 tons/year (9 ppm by volume) 0.023 pounds/million Btu



32V Vortometric burner mounted to oxidizer combustion chamber prior to piping.



FGR Mixing Tee