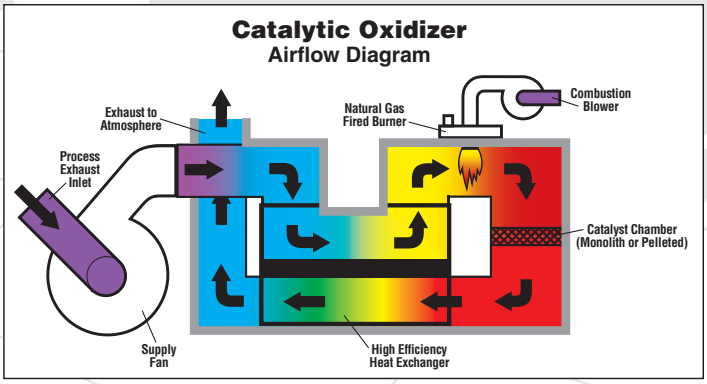
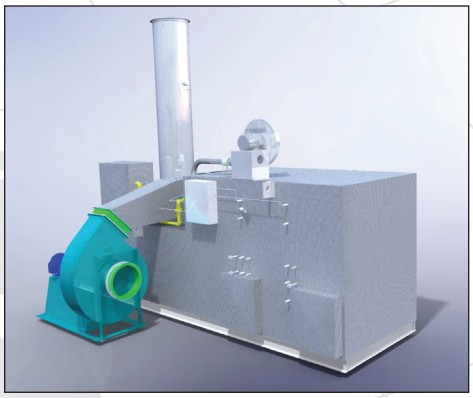
Catalytic Oxidizer

Catalytic Oxidizers from The CMM Group, LLC are designed to destroy air pollutants emitted from process exhaust streams at temperatures ranging from 260°C (500°F) to 345°C (650°F). Catalytic oxidizers utilize a high-efficiency counter-flow plate type heat exchanger. Oxidation is achieved as pollutants pass through a heated bed of precious metal catalyst.

The basic design concept of catalytic oxidation is to utilize an industrial grade catalyst to promote the chemical reaction at lower temperatures as compared to thermal oxidation. The air pollutant is mixed with oxygen, heated to an elevated temperature and passed through a catalyst, thus destroying the pollutant in the air stream by converting it to CO_2, H_2O and heat. The rate of reaction is controlled by the temperature of the catalyst chamber and the amount of time that the pollutant spends within the catalyst itself. Catalytic oxidation commonly requires less energy to operate due to lower operating temperatures.



During operation, the process exhaust fumes are forced into the catalytic oxidizer inlet plenum (using a high pressure supply fan) and directed through the "cold" side of a high-efficiency, counter-flow plate type heat exchanger. The VOC/HAP laden air then enters into the combustion chamber (typically at a temperature very close to that required for oxidation) where it is thoroughly mixed for temperature uniformity. To maintain set point temperature, auxiliary fuel is introduced if necessary. The preheated stream then passes through a fixed bed of industrial grade catalyst where air pollutant destruction takes place.



After passing through the catalyst chamber, the clean (hot) air is routed back through the "hot" side of the heat exchanger where it continuously preheats the incoming process air. Upon exiting the heat exchanger, the clean (cooled) air is routed to the atmosphere through an exhaust chamber and ultimately through the exhaust stack. Heat exchangers in standard catalytic units are typically fabricated of heavy-duty stainless steel. Thermal recovery efficiencies (TRE) range from 50% to 80%. Internal chambers of a catalytic oxidizer are manufactured entirely of heavy gauge stainless steel. Thermal expansion joints are incorporated where necessary. To maintain low external shell temperatures and minimize radiant heat loss, the internal chambers are covered with blanket insulation and then clad, typically with embossed aluminum. Air pollutant destruction efficiencies of 99% can typically be guaranteed.

Standard Features by CMM
(Many custom options available)

- High air pollutant destruction efficiencies are guaranteed
- Lowest operating costs available with energy efficient design
- Designed to meet your specific project requirements
- Proven high quality components are used throughout
- Control scheme is designed to automatically react to your manufacturing process
- Modern PLC based controls with color touch-screen interface
- Data-logger is included for recordkeeping
- Meets or exceeds all regulations

Typical Applications
(Varies based on specifications)

4,250 to 102,000+ NCMH
(2,500 to 60,000+ SCFM)

Suited for air streams with low to moderate levels of air pollutant

Common uses include:

- Coffee roasting
- Converting web dryers
- Chemical processing
- Food & baking
- Flexographic printing
- Heat-set printing
- Many others…

Typical Advantages & Disadvantages

Advantages:

- Low operating costs with low air pollutant concentrations
- Low maintenance costs
- Ease of operation
- Ease of install

Disadvantages:

- High capital cost with stainless steel parts
- Potential for catalyst poisons
- Limited to moderate air pollutant concentrations

THE CMM GROUP, LLC
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Custom Machine Manufacturing

Single Source Solutions For:

Ovens & Dryers • Energy Recovery Systems
Air Pollution Control Systems • Production Machinery

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