



**ADDITIONAL TECHNICAL INFORMATION FOR
CONTROL EQUIPMENT: AFTERBURNER - CATALYTIC OXIDIZER**

The following information will be used for the technical review of a permit to install application for a **catalytic oxidizer**. This information is in addition to the general requirements outlined in the AQD document "Information for an Administratively Complete Permit to Install Application", Part 2 - Additional Supporting Information, Items A through F. All of the information may not be needed for each application. Also, this document may not be all inclusive. Additional information beyond that identified may be necessary to complete the technical review of any individual application. In the event a determination is made that new additional information is needed for a technical review, this document will be updated.

All referenced guidance documents are available at <http://www.deq.state.mi.us/aps>, or you may contact the Permit Section at 517-373-7023.

1. Make and model number of equipment and any available literature.
2. A diagram of internals.
3. The chemical composition of the waste gases into the afterburner.
4. The heat content, in actual cubic feet per minute (acfm) and temperature of the waste gases, in °F, into the afterburner at a maximum continuous production rate.
5. Auxiliary fuel:
 - a) Type of fuel and average heating value
 - b) Maximum sulfur content
 - c) Usage rate at maximum continuous production rate and at idle
 - d) Maximum ash content for solid fuels
6. If any excess air is added into the afterburner, indicate temperature and flow rate, in acfm.
7. Describe the catalyst used and include available literature. Include the life expectancy of the catalyst and describe the method used to ensure the catalyst is effective, (i.e., methods used to prevent any significant poisoning of the catalyst).
8. The maximum space velocity¹ (1/hour) at the minimum combustion chamber outlet temperature.
9. The minimum and maximum combustion chamber inlet and outlet temperatures, in °F. Describe how the afterburner will be designed to deal with VOC overload, (i.e., VOC spiking at the combustion chamber inlet.)
10. The expected destruction efficiency for the waste gases entering the afterburner. Include any available supporting documentation such as stack test reports. NOTE: The permit may require a performance test to verify destruction and removal efficiency.
11. The estimated exhaust gas flow rate (acfm) and temperature with supporting combustion calculations based on fuel and waste gas combustion.
12. Describe any proposed monitors (combustion or other) and their location, to ensure proper operation of the afterburner.
13. Describe any heat recovery system, including an estimate of heat recovery efficiency.
14. Describe any exhaust stack insulation, expected temperature loss in the stack, the final temperature in °F, and exhaust flow in acfm, at the stack discharge point.
15. Provide a Malfunction Abatement Plan which includes a catalyst inspection program and replacement schedule.
16. Describe how the formation of dioxins/furans will be minimized when oxidizing chlorinated hydrocarbons.

¹ "Space velocity" is a measure of the contact time of the gases to be burned with the catalyst in a catalytic oxidizer. This is different than retention time, which is a measure of the total time the gases to be burned are actually in the combustion zone of a thermal oxidizer.