Massachusetts Department of Environmental Protection
Bureau of Waste Prevention – Air Quality

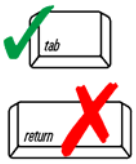
BWP AQ Afterburner/Oxidizer

Submit with Form CPA-PROCESS whenever construction, substantial reconstruction or alteration of an Afterburner/Oxidizer is proposed unless exempt per 310 CMR 7.02(2)(b).

Transmittal Number

Facility ID (if known)

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Inlet Operating Conditions

1. Complete the tables below with information on inlet gas flow(s).

Table 1a				
Emission Unit No(s). Being Controlled	**Average Inlet Gas Flow** (Actual Cubic Feet Per Minute)	**Moisture Content in the Inlet** (Pounds Per Minute)	**Inlet Temperature** (Degrees Fahrenheit (^{o}F))	**Inlet Velocity** (Feet Per Second)

Table 1b			
Provide the Maximum Gaseous Emissions			
Emission Unit No(s). Being Controlled	**Air Contaminant** (e.g. VOC, HAP, PM)*	**Air Contaminant Range Before Control** (Pounds Per Hour)	**Air Contaminant Range Before Control** (Parts Per Million, Dry Basis)

*VOC = Volatile Organic Compounds; HAP = Hazardous Air Pollutant(s)' PM = Particulate Matter

2. Provide the capture efficiency of the ventilation system serving the Afterurner/Oxidizer. The presumption is that the capture efficiency of the system meets the criteria of the Permanent Total Enclosure (PTE) detailed in EPA Method 204.

Weight Percent (%)

3. If the proposed system does not meet the PTE criteria, explain:

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B. Specifications

1. Manufacturer of Afterburner/Oxidizer: _____ Company

2. Model Number (or Equivalent): _____ Number

3. Type of Afterburner/Oxidizer: ☐ Recuperative ☐ Regenerative ☐ Catalytic ☐ Direct Flame

4a. If Regenerative, will there be a "puff" chamber? ☐ Yes ☐ No

4b. If Regenerative, describe how efficiency will be maintained when switching beds:

5a. If Catalytic, describe the unit:

5b. If Catalytic, provide dimensions of the bed: _____ Height (Inches) _____ Width (Inches) _____ Depth (Inches) _____ Weight (Pounds)

5c. If Catalytic, pressure drop range across the bed: _____ Inches of Water

6. Capacity of the Afterburner/Oxidizer: _____ Standard Cubic Feet Per Minute

7. Temperature at the Afterburner/Oxidizer outlet: _____ Degrees Fahrenheit (^{o}F)

8. Outlet gas exhaust flow rate: _____ Actual Cubic Feet Per Minute, Wet

9. Proposed minimum operating temperature of the Afterburner/Oxidizer, as measured at the downstream end of the combustion chamber: _____ Degrees Fahrenheit (^{o}F)

10. Combustion chamber temperature control mechanism: _____ Describe

11. Minimum residence time of gases in combustion chamber at the minimum temperature: _____ Seconds

12. Explain the design and operation of any heat recovery system associated with this Afterburner/Oxidizer system. Continue on a separate attachment, if necessary.

Notes:
- The burner must be able to maintain this minimum operating temperature without the benefit of the heating value of contaminants in the waste stream.
- Design calculations must be submitted that incorporate fuel, air and waste stream supply rates as well as heat transfer phenomena (including heat recovery systems) used to determine the minimum gas temperature and residence time in the combustion chamber.

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C. Fuel & Burner Data

1. Provide the burner manufacturer(s) and model number(s):

Manufacturer(s) _____ Model Number(s) _____

2. Type of Gaseous Fuel Used: ☐ Natural Gas ☐ Propane ☐ Other - Specify:

3a. Gas firing rate: _____ Maximum Cubic Feet Per Hour

_____ Minimum Cubic Feet Per Hour

3b. Maximum heat input rate: _____ British Thermal Units (Btu) Per Hour

4. Describe burner design and explain how proper mixing of fuel and combustion air will be achieved:

5. Describe the burner modulation system (e.g. full modulating, high/low, on/off):

6. If on/off modulation will be used, describe how the minimum operating temperature will be maintained at all times:

7. Describe what portion of the contaminant stream will bypass the burner to be mixed with the flame downstream:

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D. Emissions Data

1. Describe air contaminant emissions after control by the proposed Afterburner/Oxidizer:

Table 2			
Provide the Maximum Gaseous Emission Rate			
Emission Unit No(s). Being Controlled	**Air Contaminant**	**Air Contaminant Emission Range After Control** (Pounds Per Hour)	**Air Contaminant Emission Range After Control** (Parts Per Million by Volume, Dry Basis)

2. Explain how the above air contaminant emissions data were obtained. Attach appropriate calculations and documentation.

3a. Design destruction efficiency of organic compounds (as carbon) in the Afterburner/ Oxidizer: _____ Weight Percent (%)

3b. Explain how this efficiency was calculated or determined:

4a. Design destruction efficiency for inorganic hazardous air pollutants in the Afterburner/ Oxidizer: _____ Weight Percent (%)

4b. Explain how this efficiency was calculated or determined:

E. Catalytic Units Only

1. Estimated useful life of the catalyst: _____
   Amount of Time (e.g. Months or Years)

2. Describe how catalyst performance will be monitored, including the test method and frequency of testing:

F. Drawing of Afterburner/Oxidizer Control System

You must attach to this form a schematic drawing of the proposed Afterburner/Oxidizer. At a minimum, it must show the location(s) of the burner(s), catalyst bed(s), bypass damper(s), bypass stack and normal stack. Clearly indicate the gas circulation pattern through preheat and burner chambers, and through heat recovery unit(s) prior to ambient discharge. Sampling ports for emissions testing, and location of each pressure and temperature indicator must also be shown.

G. Monitoring, Record Keeping & Failure Notification

Note: You must notify the BWP Compliance & Enforcement Chief in the appropriate MassDEP regional office by telephone as soon as possible, within but no later than one (1) business day after you discover any upset or malfunction to facility equipment that results in excess emissions to the air and/or a condition of air pollution. You must submit written notice within seven (7) days thereafter.

1. Describe the parameters that will be monitored as a surrogate for control device efficiency, and the frequency of monitoring. Continue on a separate attachment, if necessary.

2. Describe the monitoring methods and warning/alarm system that protect against operation when the unit is not meeting design efficiency (e.g. visual monitoring, audible alarm, flashing lights, temperature indicator, pressure indicator). Continue on a separate attachment, if necessary.

3. Describe the record keeping procedures to be used to verify monitoring and to identify the cause, duration and resolution of each failure. Continue on a separate attachment, if necessary.

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G. Monitoring, Record Keeping & Failure Notification (continued)

4. Describe how failure of the Afterburner/Oxidizer will be made known to the operator during normal operations (e.g. visual monitoring, audible alarm, flashing lights, time indicator, pressure indicator). Continue on a separate attachment, if necessary.

5. List and explain all operating and safety controls associated with this system, including interlock systems that prevent introduction of the air contaminant(s) stream until the Afterburner/Oxidizer is operating properly. Continue on a separate attachment, if necessary.

6. Describe the Afterburner/Oxidizer's emergency procedures during system upsets. Continue on a separate attachment, if necessary.

7. Describe features of the system design that will allow for emissions testing and operation using MassDEP-sanctioned test methods. Continue on a separate attachment, if necessary.

H. Standard Operating & Maintenance Procedures

Attach to this form the standard operating and maintenance procedures for the proposed Afterburner/Oxidizer, as well as a list of the spare parts inventory that you will maintain on site, as recommended by the equipment vendor(s).

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I. Professional Engineer's Stamp

The seal or stamp and signature of a Massachusetts Registered Professional Engineer (P.E.) must be entered below. Both the seal or stamp impression and the P.E. signature must be original. This is to certify that the information contained in this Form has been checked for accuracy, and that the design represents good air pollution control engineering practice.

P.E. Name (Type or Print)

P.E. Signature

Position/Title

Company

Date (MM/DD/YYYY)

P.E. Number

Place P.E. Seal or Stamp Here.

J. Certification by Responsible Official

The signature below provides the affirmative demonstration pursuant to 310 CMR 7.02(5)(c)8 that any facility(ies) in Massachusetts, owned or operated by the proponent for this project (or by an entity controlling, controlled by or under common control with such proponent) that is subject to 310 CMR 7.00, et seq., is in compliance with, or on a MassDEP approved compliance schedule to meet, all provisions of 310 CMR 7.00, et seq., and any plan approval, order, notice of noncompliance or permit issued thereunder. This Form must be signed by a Responsible Official working at the location of the proposed new or modified facility. Even if an agent has been designated to fill out this Form, the Responsible Official must sign it. (Refer to the definition given in 310 CMR 7.00.)

I certify that I have personally examined the foregoing and am familiar with the information contained in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possible fines and imprisonment.

Responsible Official Name (Type or Print)

Responsible Official Signature

Responsible Official Title

Responsible Official Company/Organization Name

Date (MM/DD/YYYY)

This Space Reserved for MassDEP Approval Stamp.