

1100 Air Quality Management Section

1129 Emissions from Incineration of Infectious Waste

10/13/1989

1.0 General Provisions

- 1.1 The provisions of this regulation shall apply to only that waste determined to be infectious.
- 1.2 No person shall engage in the construction of a facility or facilities to be used in the treatment, storage, or disposal operation connected with the management of infectious wastes, nor shall any person enter into the material alteration of a facility, or closure of a solid waste facility managing infectious wastes, unless specifically exempted from the provisions within 2.0 of this regulation, without first having obtained the proper permits from the Department. No person shall engage in the incineration of infectious waste without proper permits from the Department.
- 1.3 Biological liquid wastes which can be directly discharged into a permitted wastewater treatment system are not subject to the provisions of this regulation.
- 1.4 Only that infectious waste which has been properly packaged, under the provisions of applicable regulations will be accepted for incineration at a facility permitted by the Department for the purpose of incineration of infectious waste.

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2.0 Exemptions

The following solid wastes are not to be managed as infectious wastes:

- 2.1 Soiled diapers produced by a person not known to have an infectious disease;
- 2.2 Wastes contaminated only with organisms which are not pathogenic to humans, and which are managed in accordance with all applicable regulations of the U.S. Department of Agriculture and the Delaware Department of Agriculture and Consumer Services and all other regulations governing this type of waste stream.
- 2.3 Food wastes which are pathogenic to humans only through direct ingestion.
- 2.4 Any infectious waste contaminated by or mixed with hazardous, radioactive, or toxic waste becomes a hazardous, radioactive or toxic waste and shall then be managed under the appropriate regulations governing those waste types (7 **Del.C.** Ch 63, 7 **Del.C.** Ch 80 and any applicable federal regulations).

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3.0 Permit Requirements

Permit requirements specific to the incineration of all infectious waste are as follows:

Any person required to have a permit for the incineration of infectious waste shall apply for a permit in accordance with 7 **DE Admin. Code** 1102. No activity shall occur prior to receipt of a permit issued by the Department. This application must include the following information:

- 3.1 The name and location of the generator or generators of the waste;

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- 3.2 A description of the origin and content of the waste, its containerization and the expected volume and frequency of waste disposal at the facility;
- 3.3 A description of the facility where the waste will be rendered noninfectious by incineration prior to disposal, including its name and the exact location;
- 3.4 A description of the handling and incineration methods to be used for each type of waste, including schematic drawings;
- 3.5 A description of the containers to be used for the storage during the collection and during the movement within the facility, including the total length of storage before incineration;
- 3.6 A description of the alternatives to be used should the incineration equipment become inoperable, and the procedures should storage of the waste become necessary resulting from the lack of prompt processing;
- 3.7 A description of the handling and safety measures that will be employed for each type of waste, including personal protection and safety as well as modifications to the operational safety plan that are required to meet the best available technology;
- 3.8 A description of the monitoring and quality assurance program for the process to render the waste noninfectious by incineration;

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4.0 Methods of Treatment and Disposal

- 4.1 All treatment of infectious waste by incineration must render the waste non-infectious.

(Note: Bed linen, instruments, equipment and other reusable items are not wastes until they are discarded. The provisions of 4.0 of this regulation apply only to wastes. The provisions of this regulation do not include the sterilization for disinfection of items that are reused for their original purpose. Therefore, the method of sterilization or disinfection of items prior to reuse is not limited. When reusable items are no longer serviceable and are discarded, they become wastes and subject to the provisions of this regulation at that time and must be sterilized by steam, incinerated, or otherwise rendered non-infectious.)
- 4.2 All pathological waste must be incinerated or interred in accordance with **24 Del.C.** Other disposal methods are not acceptable for this type of waste. This requirement does not prohibit the disposal of certain specified wastes (See General Provisions, 1.0 of this regulation) in a sanitary sewer system.

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5.0 Recordkeeping and Reporting Requirements

All facilities that incinerate infectious waste shall maintain, for a period of three years, the following records and assure that they are accurate and current:

- 5.1 A list containing the names of all individuals responsible for the incineration of infectious waste for the facility, their address, their phone numbers and the periods covering their assignment of this duty.
- 5.2 The date, persons involved and short description of events in each spill of infectious wastes.
- 5.3 A notebook or file containing the policies and procedures of the facilities for incineration of infectious wastes.

5.4 A log of all special training received by persons involved in the incineration of infectious waste.

5.5 Any person that incinerates infectious waste shall maintain a log indicating the method of monitoring the waste as well as a verification that it has been rendered noninfectious.

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6.0 Evidence of Effectiveness of Treatment

Ash generated in an infectious waste incinerator must be in compliance with **7 DE Admin. Code 1301**, Regulations Governing Solid Waste.

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7.0 Incineration

7.1 Applicability

7.1.1 The provisions of 7.0 of this regulation apply to all new, modified and existing incinerators. Any new facility or modification for which an application for a permit to construct a source of air contamination is received by the Department after the effective date of this regulation must comply with the requirements of this regulation before operation may commence.

7.1.2 Permitting Procedures

The permitting procedures are specified in **7 DE Admin. Code 1102**. The permit application shall also address emissions of:

7.1.2.1 Nitrogen Oxides;

7.1.2.2 Sulfur Oxides;

7.1.2.3 Polychlorinated DiBenzo Dioxins and Furans; and

7.1.2.4 metals including Arsenic, Beryllium, Cadmium, Chromium, Lead, Mercury and Nickel.

The emission of 7.1.2.1 through 7.1.2.4 of this regulation shall be estimated and the basis for the estimate shall be included. Annual ambient levels shall be estimated based on air quality modeling procedures acceptable to the Department.

7.1.3 The provisions of 7.2 of this regulation establish the standards to be met when incineration is the chosen method of infectious waste disposal. Any person owning or operating an incinerator shall comply with the following general requirements.

7.1.3.1 Supervision - The operation and management of incinerators shall be under the direct supervision and control of individuals qualified in incinerator management by training, education and experience.

7.1.3.1.1 No incinerator shall be permitted to operate until the applicant has submitted written documentation that demonstrates to the satisfaction of the Department that the incinerator shall at all times be operated under the direction of individuals who have received and successfully completed the training necessary for the operations of the incinerator.

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- 7.1.3.1.2 The permittee shall implement an operator training program approved by the Department, which at a minimum includes a time schedule and means for accomplishing the training of all incinerator personnel in the following areas:
 - 7.1.3.1.2.1 Proper operation and maintenance of equipment (including start-up, shut down, routine and upset conditions); and
 - 7.1.3.1.2.2 Knowledge of environmental permit conditions and the impact of incinerator operations on any and all emissions.
 - 7.1.3.1.3 The permittee shall implement a preventative maintenance program for all incinerator equipment, including instrumentation, approved by the Department, which includes at least the following:
 - 7.1.3.1.3.1 Preventative Maintenance schedule and documentation that work has been accomplished; and
 - 7.1.3.1.3.2 Spare parts list and inventory control system to assure availability.
 - 7.1.3.2 Wastewater - Any and all wastewater resulting from the operation of an incinerator shall be managed in accordance with applicable regulations.
 - 7.1.3.3 Air Quality - Atmospheric emissions shall not violate 7 **DE Admin. Code** 1100, Regulations Governing the Control of Air Pollution or applicable permit conditions.
 - 7.1.3.4 Information Posting - Signs shall be posted at the entrance to the incinerator area indicating the days and hours of operation. Access to and operation of the incinerator shall be limited to those times when authorized personnel are on duty.
 - 7.1.3.5 Fire Control - Fire control equipment shall meet the requirements of the applicable fire codes and the underwriters requirements.
- 7.2 Performance Standards
- 7.2.1 Large Incinerators
 - 7.2.1.1 Design Criteria
 - 7.2.1.1.1 All large incinerators shall be designed with a primary and a secondary combustion chamber.
 - 7.2.1.1.2 The primary chamber shall be designed so that the infectious waste will be subject to a minimum temperature of 1600°F.
 - 7.2.1.1.3 There shall be auxiliary burners available so that:
 - 7.2.1.1.3.1 this temperature can be achieved prior to the introduction of infectious waste;
 - 7.2.1.1.3.2 this temperature can be maintained during the incineration process; and
 - 7.2.1.1.3.3 this temperature can be maintained until all the waste has been reduced to incombustibles and products of combustion.

7.2.1.1.4 There shall be control systems which will:

7.2.1.1.4.1 automatically control burners to maintain the required temperatures; and

7.2.1.1.4.2 prevent the charging of waste when the required temperature has not been achieved.

7.2.1.1.5 Incinerators shall:

7.2.1.1.5.1 incorporate an air lock system to prevent opening the incinerator to the room environment; and

7.2.1.1.5.2 have the volume of the loading system designed so as to prevent overcharging to assure complete combustion of the waste.

7.2.1.1.6 The secondary chamber shall be designed so that the gases generated by the infectious waste combustion in the primary chamber will be subjected to a temperature of 1800°F for at least 1.0 second. There shall be auxiliary burners available so that this temperature in the secondary chamber can be achieved prior to the introduction of infectious waste, and with an appropriate control system to maintain this temperature.

7.2.1.1.7 The Department may issue permits consistent with the above criteria based on an application which satisfies the Department of the adequacy of the alternatives with regard to all the considerations of this regulation and other considerations which the Department deems to be appropriate.

7.2.1.2 Combustion Gas Criteria

7.2.1.2.1 The composition of the flue gases, at the point where they have been subjected to the design criteria established in 7.2.1.1 of this regulation must be:

7.2.1.2.1.1 minimum oxygen content of 4%; and

7.2.1.2.1.2 maximum carbon monoxide content of 100 ppmv, dry basis, corrected to 7% oxygen.

7.2.1.2.2 There shall be instrumentation to continuously monitor and record:

7.2.1.2.2.1 the temperatures in the primary chamber and the secondary chambers; and

7.2.1.2.2.2 the oxygen and carbon monoxide content of the flue gases.

The oxygen and carbon monoxide measurements are to be representative of the location where the combustion gases have been subject to the criteria established in 7.2.1.1 of this regulation. The actual measurements of oxygen and carbon monoxide may be made elsewhere in the flue gas system provided adequate correlation exists and appropriate correction factors can be established.

7.2.1.2.3 There shall be a system to automatically control the combustion air flow in order to maintain the required minimum oxygen content.

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7.2.1.2.4 The air vented from the waste storage area shall be included in the primary combustion air for the incinerator to the maximum extent practicable.

7.2.1.3 Emission Limits

7.2.1.3.1 Particulate

7.2.1.3.1.1 The particulate emissions from the incinerator shall not exceed 0.03 grain per dry standard cubic foot corrected to 7% oxygen.

7.2.1.3.1.2 The infectious waste shall be received and stored in such a manner that there will be no fugitive emissions.

7.2.1.3.1.3 The ash shall be loaded in an enclosed area and shall be stored in such a manner that there will be no fugitive emissions.

7.2.1.3.2 Hydrogen Chloride

The emissions shall not exceed 10% by weight of the uncontrolled emissions unless the stack gas concentration is less than 50 ppmv, dry basis, corrected to 7% oxygen, or the uncontrolled emission rate is less than four pounds per hour.

7.2.2 Small Incinerators

7.2.2.1 Design Criteria

7.2.2.1.1 All small incinerators shall be designed with a primary and a secondary combustion chamber.

7.2.2.1.2 The primary chamber shall be designed so that the infectious waste will be subject to a minimum temperature of 1600°F. The primary chamber must:

7.2.2.1.2.1 achieve this temperature prior to the introduction of infectious waste; and

7.2.2.1.2.2 maintain this temperature during the incineration process until all the waste has been reduced to incombustibles and products of combustion.

7.2.2.1.3 There shall be systems which will:

7.2.2.1.3.1 automatically control burners to maintain the required temperatures; and

7.2.2.1.3.2 prevent the charging of waste when the required temperature has not been achieved.

7.2.2.1.4 Incinerators shall:

7.2.2.1.4.1 incorporate an air lock system to prevent opening the incinerator to the room environment; and

7.2.2.1.4.2 have the volume of the loading system designed so as to prevent overcharging to assure complete combustion of the waste.

7.2.2.1.5 The secondary chamber shall be designed so that the gases generated by the infectious waste combustion in the primary chamber will be subjected to a temperature of 1800°F. There shall be auxiliary burners available so that this temperature can be achieved prior to the introduction of infectious waste, and with an appropriate control system to maintain this temperature.

7.2.2.1.6 The Department may issue permits consistent with the above criteria based on an application which satisfies the Department of the adequacy of the alternatives with regard to all the considerations of this regulation and other considerations which the Department deems to be appropriate.

7.2.2.2 Combustion Gas Criteria

7.2.2.2.1 The composition of the flue gases, at the point where they have been subjected to the design criteria established in 7.2.2.1 of this regulation must be:

7.2.2.2.1.1 minimum oxygen content of 4%; and

7.2.2.2.1.2 maximum carbon monoxide content of 100 ppmv, dry basis, corrected to 7% oxygen.

7.2.2.2.2 There shall be instrumentation to continuously monitor and record the temperatures in both the primary and the secondary chambers.

7.2.2.2.3 There shall be a trained operator in attendance when the incinerator is operating, if a system to automatically control the combustion air flow in order to maintain the required minimum oxygen content is not installed.

7.2.2.3 Emission Limits

7.2.2.3.1 Particulate:

7.2.2.3.1.1 The particulate emissions from the incinerator shall not exceed 0.08 grain per dry standard cubic foot corrected to 7% oxygen.

7.2.2.3.1.2 The infectious waste shall be received and stored in such a manner that there will be no fugitive emissions.

7.2.2.3.1.3 The ash shall be loaded and stored in such a manner that there will be no fugitive emissions.

7.2.2.3.2 Hydrogen Chloride

The emission shall not exceed 10% by weight of the uncontrolled emissions unless the stack gas concentration is less than 50 ppmv, dry basis, corrected to 7% oxygen, or the uncontrolled emission rate is less than four pounds per hour.

7.2.3 Emission Monitoring Equipment and Instrumentation

7.2.3.1 There shall be continuous emission monitoring equipment for opacity on both large and small incinerators.

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- 7.2.3.2 At such time that the Department determines Hydrogen Chloride emissions monitoring equipment to be reliable and commercially available, all large incinerators must install these monitoring devices.
- 7.2.3.3 The continuous emission monitoring equipment required by the Department shall meet the requirements of 7 **DE Admin. Code** 1117.
- 7.2.3.4 Prior to and following controls, Hydrogen Chloride emissions shall be monitored if Best Available Control Technology is used to achieve the 90% reduction compliance with 7.2.1.3.2 and 7.2.2.3.2 of this regulation.
- 7.2.3.5 There shall be a Quality Assurance Plan approved by the Department for emission monitoring equipment and instrumentation required to meet the requirements of 7.0 of this regulation and any permits issued there under.

7.2.4 Compliance Determinations

- 7.2.4.1 Compliance with particulate emissions shall be determined by test procedures acceptable to the Department, and by continuing demonstration of proper operation of the incinerator and control equipment.
- 7.2.4.2 Compliance with the Hydrogen Chloride emissions shall be determined by the continuous emission monitoring system where applicable, or by a method acceptable to the Department.
- 7.2.4.3 Compliance with the limits specified by 7.2.1.1 and 7.2.1.2, and 7.2.2.1 and 7.2.2.2 of this regulation shall be determined by the continuous monitoring systems.
- 7.2.4.4 The rolling three hour average of Hydrogen Chloride shall not exceed the combustion gas criteria specified in 7.2.1.3.2 and 7.2.2.3.2 of this regulation.
- 7.2.4.5 The rolling three hour average of Carbon Monoxide shall not exceed the combustion gas criteria specified in 7.2.1.2.1 and 7.2.2.2.1 of this regulation.
- 7.2.4.6 The primary and secondary chamber combustion temperatures shall not be less than those specified in 7.2.1.1.2 and 7.2.1.1.6 or 7.2.2.1.2 and 7.2.2.1.5 of this regulation longer than 15 minutes.
- 7.2.4.7 The required combustion gas oxygen levels shall not be less than those specified in 7.2.1.2.1 and 7.2.2.2.1 of this regulation longer than 15 minutes.
- 7.2.4.8 The emission of visible air contaminants from this unit shall not exceed 10% opacity for an aggregate of more than three minutes in any one hour period or more than 15 minutes in any 24 hour period.
- 7.2.4.9 The Department reserves the right to require pathogen destruction efficiency tests.

7.2.5 Existing Incinerators

Within 180 days of the promulgation of this regulation, existing incinerators shall submit:

- 7.2.5.1 documentation to demonstrate compliance with 7.2.1 or 7.2.2 of this regulation; or
- 7.2.5.2 plans, with a time schedule, to come into compliance; or

7.2.5.3 a unit closure plan with a time schedule.