

**STANDARDS FOR TREATMENT AND DISPOSAL OF BIO-MEDICALWASTE  
BY INCINERATION AND PLASMA PYROLYSIS OR GASIFICATION**  
(As per Schedule II of the Bio-medical Waste Management Rules, 2016)

**1. STANDARDS FOR INCINERATION.-**

All incinerators shall meet the following operating and emission standards-

**A. Operating Standards**

1). Combustion efficiency (CE) shall be at least 99.00%.

2). The Combustion efficiency is computed as follows:

$$\text{C.E.} = \frac{\% \text{CO}_2}{\% \text{CO}_2 + \% \text{CO}} \times 100$$

3). The temperature of the primary chamber shall be a minimum of 800 °C and the secondary chamber shall be minimum of 1050°C + or - 50°C.

4). The secondary chamber gas residence time shall be at least two seconds.

**B. Emission Standards**

Sl. No.	Parameter	Standards	
		3.	4.
		<b>Limiting concentration in mg/Nm<sup>3</sup> unless stated</b>	<b>Sampling Duration in minutes, unless stated</b>
1.	Particulate matter	50	30 or 1NM <sup>3</sup> of sample volume, whichever is more
2.	Nitrogen Oxides NO and NO <sub>2</sub> expressed asNO <sub>2</sub>	400	30 for online sampling or grab sample
3.	HCl	50	30 or 1NM <sup>3</sup> of sample volume, whichever is more
4.	Total Dioxins and Furans	0.1ngTEQ/Nm <sup>3</sup> (at 11% O <sub>2</sub> )	8 hours or 5NM <sup>3</sup> of sample volume, whichever is more
5.	Hg and its compounds	0.05	2 hours or 1NM <sup>3</sup> of sample volume, whichever is more

**C. Stack Height:** Minimum stack height shall be 30 meters above the ground and shall be attached with the necessary monitoring facilities as per requirement of monitoring of 'general parameters' as notified under the Environment (Protection) Act, 1986 and in accordance with the CPCB Guidelines of Emission Regulation Part-III.

*Note:*

(a) The existing incinerators shall comply with the above within a period of 2 years from the date of the notification.

(b) The existing incinerators shall comply with the standards for Dioxins and Furans of  $0.1\text{ngTEQ/Nm}^3$ , as given below within two years from the date of commencement of these rules.

(c) All upcoming Common Bio-medical Waste Treatment and Disposal Facilities having incineration facility or captive incinerator shall comply with standards for Dioxins and Furans.

(d) The existing secondary combustion chambers of the incinerator and the pollution control devices shall be suitably retrofitted, if necessary, to achieve the emission limits.

(e) Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants.

(f) Ash from incineration of biomedical waste shall be disposed of at Common Hazardous Waste Treatment and Disposal Facility. However, it may be disposed of in municipal landfill, if the toxic metals in incineration ash are within the regulatory quantities as defined under the Hazardous Waste (Management and Handling and Transboundary Movement) Rules, 2008 or as revised from time to time.

(g) Only low Sulphur fuel like Light Diesel Oil or Low Sulphur Heavy Stock or Diesel, CNG, PNG or LGP shall be used as fuel in the incinerator.

(h) The occupier or operator of a common bio-medical waste treatment facility shall monitor the stack gaseous emissions (under optimum capacity of the incinerator) once in three months through a laboratory approved under the Environment (Protection) Act, 1986 and record of such analysis results shall be maintained and submitted to the prescribed authority. In case of dioxins and furans, monitoring should be done once in a year.

(i) The occupier or operator of the common bio-medical waste treatment facility shall install continuous emission monitoring system for the parameters as stipulated by SPCBs or PCCs in authorization and transmit the data real time to the servers at SPCBs or PCCs and CPCB.

(j) All monitored values shall be corrected to 11% Oxygen on dry basis.

(k) Incinerators (combustion chambers) shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon (TOC) content in the slag and bottom ashes less than 3% or their loss on ignition shall be less than 5% of the dry weight.

(l) The occupier or operator of a common bio-medical waste incinerator shall use combustion gas analyzer to measure CO<sub>2</sub>, CO and O<sub>2</sub>.

## **2. Operating and Emission Standards for Disposal by Plasma Pyrolysis or Gasification:**

### **A. Operating Standards:**

All the operators of the **Plasma Pyrolysis or Gasification** shall meet the following operating and emission standards:

1) Combustion Efficiency (CE) shall be at least 99.99%.

2) The Combustion Efficiency is computed as follows.

$$C.E = \frac{\% CO_2}{(\% CO_2 + \% CO)} \times 100$$

3) The temperature of the combustion chamber after plasma gasification shall be 1050 ± 50 ° C with gas residence time of at least 2(two) second, with minimum 3 % Oxygen in the stack gas.

4) The Stack height should be minimum of 30 m above ground level and shall be attached with the necessary monitoring facilities as per requirement of monitoring of 'general parameters' as notified under the Environment (Protection) Act, 1986 and in accordance with the CPCB Guidelines of Emission Regulation Part-III.

### **B. Air Emission Standards and Air Pollution Control Measures**

(i) Emission standards for incinerator, notified at Sl No.1 above in this Schedule, and revised from time to time, shall be applicable for the Plasma Pyrolysis or Gasification also.

- (ii) Suitably designed air pollution control devices shall be installed or retrofitted with the 'Plasma Pyrolysis or Gasification to achieve the above emission limits, if necessary.
- (iii) Wastes to be treated using Plasma Pyrolysis or Gasification shall not be chemically treated with any chlorinated disinfectants and chlorinated plastics shall not be treated in the system.

**C. Disposal of Ash Vitrified Material:** The ash or vitrified material generated from the 'Plasma Pyrolysis or Gasification shall be disposed off in accordance with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules 2008 and revisions made thereafter in case the constituents exceed the limits prescribed under Schedule II of the said Rules or else in accordance with the provisions of the Environment (Protection) Act, 1986, whichever is applicable.

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