

NATIONAL TECHNICAL REGULATION

QCVN 02:2012/BTNMT

NATIONAL TECHNICAL REGULATION ON SOLID HEALTH CARE WASTE INCINERATOR

Foreword

QCVN 02:2012/BTNMT is prepared by the team drafting the *Circular on promulgation of National technical standard on solid health care waste incinerator and National technical standard on industrial waste incinerator*, submitted by the Department of Science and Technology and Department of Legal Affairs to obtain approval from, and promulgated together the Circular No. 27/2012/TT-BTNMT dated December 28, 2012 by, the Minister of Agriculture and Rural Development.

NATIONAL TECHNICAL REGULATION ON SOLID HEALTH CARE WASTE INCINERATOR

1. GENERAL

1.1. Scope

This document provides for technical and environmental requirements for solid healthcare waste incinerators.

1.2. Regulated entities

This document applies to producers, importers, traders (distributors) and users of solid health care waste incinerators within the territory of the Socialist Republic of Vietnam; environment authorities; sample collectors and analyzers and relevant organizations and individuals.

1.3. Definitions

For the purposes of this document, the terms below shall be construed as follows:

1.3.1. **“solid health care waste”** (hereinafter referred to as “SHCW”) means solid waste generated from health care activities and includes hazardous waste and non-hazardous waste (normal waste).

1.3.2. **“solid health care waste incinerator”** means a system which is used for treatment of SHCW by burning and equipped with flue gas treatment system.

1.3.3. **“combustion chamber”** means a space where SHCW is incinerated by high temperature. It consists of:

a) **“primary combustion chamber”** means a space where waste is combusted and reduced into gaseous and solid products (slag, dust);

b) **“secondary combustion chamber”** means a space where non-combusted gases leaving the primary combustion chamber are combusted by high temperature.

1.3.4. **“retention time”** means the length of time that the flue gas moves from the entry point to the exit point of the secondary combustion chamber at the temperature prescribed in the Table 1 of this document.

1.3.5. **“flue gas”** means the mixture of material matters emitted into the air environment from the SHCW incinerator stack.

1.3.6. **“slag”** means residual solid materials from combustion processes in the SHCW incinerator.

1.3.7. **“dust”** is a common name for dust and fly ash that are generated during waste incineration and retained during the flue gas treatment.

1.3.8. **“capacity”** means the handling ability of a SHCW incinerator and is calculated by the maximum quantity of waste that is completely combusted by the SHCW incinerator per hour (kg/h).

1.3.9. **“licensing authority”** means an authority that issues the license for hazardous waste management or an authority that confirms the construction of works and implementation of environmental protection measures before putting a SHCW incinerator into operation in case the license for hazardous waste management is not required (the incinerator only serves the purpose of treating SHCW internally generated within a health facility).

2. TECHNICAL REQUIREMENTS

2.1. Basic technical requirements for SHCW incinerators

2.1.1. SHCW incinerator must operate in the principle of multiple-level combustion and be comprised of at least two combustion chambers (primary and secondary combustion chambers). Combustion chamber volume is calculated according to the capacity and retention time of IW incinerator according to the Appendix I enclosed with QCVN 30:2012/BTNMT - National technical regulation on industrial waste incinerator.

2.1.2. Pressure in the SHCW incinerator must be lower than external pressure (also known as negative pressure) to restrict the amount of smoke emitted into the air from the waste intake gate.

2.1.3. Stack of a SHCW incinerator must satisfy the following requirements:

a) Stack height must be logically designed so as to satisfy all requirements on ambient air quality when flue gas is released into the air environment provided that it is not less than 20m above the ground level. Within 40m measured from the base of the stack, if there is a fixed obstacle (such as a building, row of trees or hill), the height of the stack must be at least 03m higher than the top of that obstacle;

b) The flue gas sampling porthole on the stack must be at least 10cm in diameter or width of each dimension, covered by a cap for adjusting the opening level; working platform must be safe and convenient for access and sampling. Sampling porthole must be located between the two following locations:

- Lower bound: At a distance of at least 07 times the inner diameter of the stack above the highest point of the joint between the stack and the pipe of the flue gas treatment system;

- Upper bound: At a distance of 03m below the stack flue.

2.1.4. During its normal operation, a SHCW incinerator must meet basic specifications provided in Table 1 below:

Table 1. Basic specifications for a SHCW incinerator

No.	Specifications	Measurement unit	Required value
1	Primary combustion chamber temperature	°C	≥ 650
2	Secondary combustion chamber temperature	°C	≥ 1.050
3	Retention time of the secondary combustion chamber	s	≥ 2
4	Residual oxygen (measured at the sampling porthole)	%	6 - 15
5	Temperature on the outside of the IW incinerator (or the thermal barrier coating)	°C	≤ 60
6	Temperature of flue gas released into the air (measured at the sampling porthole)	°C	≤ 180

2.1.5. It is not allowed to use the air outside the incinerator to dilute the flue gas from the exit point of the secondary combustion chamber to the point at a distance of 02m above the sampling porthole on the stack.

2.1.6. The SHCW incinerator must be equipped with a flue gas treatment system that operates according to the following stages:

a) Cooling (quickly lowering temperature). It is not allowed to mix the air outside directly into the flue gas flow for cooling purposes;

b) Dust handling (dry or wet);

c) Handling of hazardous components in flue gas (such as absorption).

Some of the treatment stages may be completed within one device, or one stage may be completed by more than one device in a flue gas treatment system.

2.2. Maximum allowable values of parameters of pollutants in flue gas of SHCW incinerator

During its normal operation, values of parameters of pollutants in flue gas of SHCW incinerator must not exceed those provided in Table 2 below when they are released into the air:

Table 2: Maximum allowable values of parameters of pollutants in flue gas

No.	Parameters of pollutants	Measurement unit	Maximum allowable value	
			A	B
1	Total particulate matter	mg/Nm ³	150	115
2	Hydrochloric acid, HCl	mg/Nm ³	50	50
3	Carbon monoxide, CO	tng/Nm ³	350	200
4	Sulfur dioxide, SO ₂	mg/Nm ³	300	300
5	Nitrogen oxide (NO _x) (expressed as NO ₂)	mg/Nm ³	500	300

6	Mercury and its compounds (Hg)	mg/Nm ³	0,5	0,5
7	Cadmium and its compounds (Cd)	mg/Nm ³	0,2	0,16
8	Lead and its compounds (Pb)	mg/Nm ³	1,5	1,2
10	Total PCDDs/PCDFs	ngTEQ/Nm ³	2,3	2,3

Where:

- Column A is applied to SHCW incinerators at centralized SHCW treatment facilities specified in planning (not located within health facilities);
- Column B is applied to SHCW incinerators located within health facilities.

3. REGULATIONS ON OPERATION, INCIDENT RESPONSE AND MONITORING

3.1. Operation of SHCW incinerators

3.1.1. A safe operating procedure for SHCW incinerator must be established and applied, and consisted of the following contents:

a) Except SHCW incinerators that adopt a special operating procedure prescribed by manufacturers and seriously considered by licensing authorities, a SHCW incinerator must be started according to the following steps:

- Step 1: Start the flue gas treatment system;
- Step 2: Start and heat all combustion chambers. Only feed some types of non-hazardous waste with high heating value (like biomass waste) to replace or add traditional fuel after traditional fuel is used to heat the primary combustion chamber and secondary combustion chamber up to 300°C and 800°C respectively. Specify non-hazardous waste used in this process in the procedure;
- Step 3: Feed waste into the SHCW incinerator. Only feed hazardous SHCW if combustion chamber temperature reaches the value provided in Table 1 of this document.

b) Operation of a SHCW incinerator must end according to the following steps:

- Step 1: Stop feeding waste into the IW incinerator. Keep mixing remaining waste in the primary combustion chamber and supplying fuel (if necessary) until waste is completely combusted;
- Step 2: Stop supplying fuel to the primary combustion chamber after waste has been completely combusted (no sign of combustion);
- Step 3: Stop supplying fuel to the secondary combustion chamber when there is no smoke in the primary combustion chamber and there is no flue gas emitted through the stack;
- Step 4: Stop the flue gas treatment system and end the operation of the combustion chamber when temperature of the primary combustion chamber falls below 300°C.

3.1.2. Waste must be controlled before being fed into the SHCW incinerator so as not to influence the normal operation of the incinerator. Waste that fails to be treated by the incinerator should not be fed.

3.1.3. It is not allowed to combust radioactive waste, waste posing risk of explosion, waste containing PVC, corrosive waste or waste containing mercury, lead, cadmium and organic halogens in excess of hazardous waste thresholds prescribed in QCVN 07:2009/BTNMT - National technical regulation on hazardous waste thresholds.

3.1.4. A log of operation of SHCW incineration should be kept and include information about the quantity of combusted waste, up-time and operator's name.

3.2. Management of waste generated from SHCW incinerators

3.2.1. Wastewater generated from the process of operating flue gas treatment system (if any) is only released into the environment after it is treated according to QCVN 40:2011/BTNMT - National technical regulation on industrial wastewater.

3.2.2. Slag, ash, dust, waste sludge and other solid waste generated from the process of operating the SHCW incinerator shall be distinguished and sorted according to QCVN 07:2009/BTNMT.

3.3. Incident prevention and response

3.3.1. A fire prevention and response plan should be formulated in accordance with regulations on fire prevention and fighting under the guidance of the fire authority.

3.3.2. Plans for prevention of and response to other incidents should be formulated and implemented in accordance with regulations on management of hazardous waste and health care waste and relevant regulations.

3.3.3. In addition to manual shutdown mechanism, combustion chambers must provide an automatic shutdown mechanism in case of incident.

3.3.4. The SHCW incinerator must be equipped with by-pass valve so as to release flue gas directly through the stack in case the flue gas treatment system fails. The bypass valve may be operated by a manual or automatic control switch which is designed at a height suitable for the operator and convenient for control of the bypass valve in case of upset. The introduction of waste into the incinerator must be stopped immediately when operating the bypass valve. The incinerator is only allowed to operate after the failure is handled. The bypass valve must bear the seal of the licensing authority and a notification must be sent to the licensing authority within 48 hours after the seal is broken.

3.4. Monitoring of SHCW incinerators

3.4.1. SHCW incinerators must install automatic and continuous monitoring equipment to measure and record combustion chamber temperature and post-treatment temperature of flue gas.

3.4.2. Cameras or monitoring doors must be installed to monitor the process of combusting waste in the primary combustion chamber with at least 05cm in diameter or width of each dimension.

3.4.3. Periodic environmental monitoring of the SHCW incinerator shall be carried out in accordance with applicable regulations and at the request of the licensing authority at least every 03 months.

3.4.4. The automatic and continuous monitoring of certain parameters in flue gas and sampling of PCDDs/PCDFs shall be only carried out in special cases at the request of the licensing authority.

4. DETERMINATION METHODS

4.1. Methods for determination of parameters of pollutants in the SHCW incinerator are provided in the following national standards:

- TCVN 5977:2009 - Stationary source emissions – Manual determination of mass concentration of particulate matter;
- TCVN 6750:2000 - Stationary source emissions – Determination of mass concentration of sulfur dioxide - Ion chromatography method;
- TCVN 7172:2002 - Stationary source emissions – Determination of the mass concentration of nitrogen oxides - Naphthylethylenediamine photometric method;
- TCVN 7242:2003 - Health care solid waste incinerators - Determination method of carbon monoxide (CO) concentration in flue gas;
- TCVN 7244:2003 - Health care solid waste incinerators - Determination method of hydrochloric acid (HCl) concentration in flue gas;
- TCVN 7557-1:2005 - Health care solid waste incinerators - Determination of heavy metals in flue gas – Part 1: General requirements;
- TCVN 7557-2:2005 - Health care solid waste incinerators - Determination of heavy metals in flue gas – Part 2: Determination of mercury concentrations by cold vapour atomic absorption method;
- TCVN 7557-3:2005 - Health care solid waste incinerators - Determination of heavy metals in flue gas – Part 3: Determination of cadmium and lead concentrations by flame and electrothermal atomic absorption spectrometric method;
- TCVN 7556-3:2005 - Health care solid waste incinerator - Determination of the mass concentration of PCDDs/PCDFs - Part 3: Identification and quantification.

4.2. International standards that have their accuracy proved equal to or higher are accepted to determine concentration of parameters of pollutants in flue gas in SHCW incinerators or when national standards are not available.

5. IMPLEMENTATION

5.1. This document comes into force from March 01, 2013 and replaces QCVN 30:2010/BTNMT - National technical regulation on solid health care waste incinerator.

5.2.1. Every organization and individual that use SHCW incinerators within the territory of the Socialist Republic of Vietnam shall comply with regulations of this document, except in the cases where SHCW incinerators that operated before March 01, 2018 shall be temporarily exempt from some regulations (except those specified in Section 2.2) of this document until June 30, 2016 if such regulations require upgrade, improvement, adjustment or addition of their current design, structure, equipment and materials.

5.3. During the period when a particular technical regulation is not available, flue gas of incinerators shall comply with Column A Table 2 Section 2.2 and shall not apply TCVN 6560:1999 (6560:2005) - Air quality - Emission Standards for health care solid waste incinerators - Permissible limits under the

guidance provided in Section 2 Part X of the Circular No. 02/2009/TT-BYT dated May 26, 2009 of the Ministry of Health.

5.4. In the cases where any of the national technical regulations and national standards referred to in this document is amended or replaced, the newest one shall apply.

5.5. Environment authorities shall provide guidelines, inspect and supervise the implementation of this document./.