EMDC 2 (211) DTZS



DRAFT TANZANIA STANDARD

Air Quality — Tolerance limits for incinerator pollutants emission to air

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0 Foreword

Pollutants emission from incinerators both small and large cause atmospheric air pollution when not controlled from the source. Some of these pollutants are toxic and can directly or indirectly endanger people's lives as well as destroy the environment. Efforts should be made in emission reduction and in accordance with the pre-set tolerance limits discussed in this document

The most relevant and potential air polluting substances released from most of incinerators are normally gaseous pollutants and particulates including heavy metals. These includes: Carbon monoxide (CO), Nitrogen oxides (NOx), Sulphur dioxides (SO₂), Hydrocarbons, Particulate matters (PM), Particulate Lead (Pb), Chromium (Cr), Zinc (Zn), Iron (Fe), Mercury vapour (Hg), Cadmium (Cd), Dioxins (PCDDs) and Furans (PCDFs)

Sampling and test methods are also prescribed in order to have a uniform way of assessment hence make results comparable. References for such methods are given in this Tanzania Standard. Provision for on-line analysers is also given without mentioning a specific equipment.

During the course of implementation some transition period may be required to adjust to new technology or have the necessary equipment in place. These are administrative procedures, which should be sorted out by consultations between factories, institutions and relevant government authority. Also some air pollution technologies such as wet scrubbers and cyclones can be installed in stack so as to attain the prescribed limits.

In the preparation of this draft Tanzania Standard, assistance was derived from

Recommendation of key design/operating parameters for small – scale incinerator, derived from EPA (2000) and UNDP (2003)

Directive 2000/76/EC of the EU Parliament and the council on the incineration of waste.

Proposed emission standards for incinerators used in MSW Plants published by National Green Tribunal (2015, India)

In reporting the results of a test or analysis made in accordance with this Tanzania Standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 (see clause 2).

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1 Scope

This Draft Tanzania Standard prescribes the tolerance limits for pollutants emissions from all types of incinerators except incinerators used for hospital wastes.

Note: Incineration for Hospital wastes are covered under TZS 1681:2014/EAS 491:2008 – Incineration plant for destruction of hospital waste - Specifications

2 References

For the purpose of this Tanzania Standard, the following references shall apply:

TZS 836 (Part 1), Air quality — General considerations — Vocabulary

TZS 837 (Part 2), Sampling of gaseous pollutants

TZS 837 (Part 3), Stationary source emissions — Manual determination of mass concentration of particulate matter

TZS 837 (Part 4), Stationary source emissions — Determination of mass concentration of sulphur dioxide

TZS 837 (Part 5), Stationary source emissions — Determination of the mass concentration of nitrogen oxides — Naphthylethylenediamine photometric method

TZS 837 (Part 6), Stationary source emissions – Determination of carbon monoxide, carbon dioxide and oxygen – Performance characteristics and calibration of automated measuring systems

TZS 837 (Part 7), Stationary source emissions – Determination of gas and particle-phase polycyclic aromatic hydrocarbons – Sample preparation, cleanup air and determination

TZS 837 (Part 8), Sampling and test method – Determination of particulate lead content of aerosols collected on filters – atomic absorption spectrometric method

ISO 21741:2020, Stationary source emissions – Determination of the concentration of total mercury

BS EN 14385:2004, Stationary source emissions – Determination of Heavy metals

BS EN 1948-4, Stationary source emissions – Determination of mass concentration of PCDDs/PCDFs and dioxins like PCBs

TZS 4, Rounding off numerical values

3 Terminology

For the purpose of this Tanzania Standard, the following definitions and those given in TZS 836 (Part 1) (see clause 2) shall apply:

3.1 charge

the quantity of waste (in kg) loaded into the incinerator during one charging operation

3.2 charging period

the specified period (in h) over which the incinerator is to be charged with waste

3.3 charging frequency

the quotient of the incinerator capacity and the charge (in charges per hour)

3.4 charging or loading

the process of transferring a charge into the primary combustion chamber.

3.5 combustible matter in residue

the amount of unburnt combustible material, remaining in the residue after incineration, expressed as a percentage by mass of the total dry ash residue.

3.6 design temperature

the temperature in the gas zone at which destruction of waste occurs.

3.7 dust

small solid particles, conventionally taken as those particles below 75 μ m in diameter, which settle out under their own weight but which may remain suspended for some time.

3.8 emission

discharge of substances into the atmosphere. The point or area from which the discharge takes place is called the "source". The term is used to describe the discharge and the rate of discharge. The term can also be used for noise, heat, etc.

3.9 incineration capacity

the quotient of the amount of waste which is to be incinerated and the charging period (in kg/h)

3.10 primary burner

an auxiliary fuel burner installation the primary combustion chamber to dry out and /or ignite the material to be burned

3.11 primary combustion zone

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the volume in which solid phase reactions occur (in m³)

3.12 secondary burner

an auxiliary fuel burner installed in a secondary combustion chamber

3.13 secondary combustion chamber

the chamber where unburned combustibles from the primary combustion chamber are completely burned

NOTE: This chamber can be either part of the incinerator itself or a separate chamber.

3.14 secondary combustion zone

the volume in which gas phase reactions occur (in m³)

4 Requirements

4.1 Tolerance limits

Tolerance limits of emissions from incinerator shall comply with the requirements given in Table 1, when tested in accordance with the test methods prescribed therein.

Table 1 — Specific tolerance limits of emissions from incinerator

| S/N | Characteristic (Parameters) | Limit (mg/m ³) | Test method |
|-----|--------------------------------|-------------------------------|------------------|
| 1 | Particulate matters (PM) | 200 | TZS 837 (Part 3) |
| 2 | СО | 250 | TZS 837 (Part 6) |
| 3 | NOx | 400 | TZS 837 (Part 5) |
| 4 | SO ₂ | 850 | TZS 837 (Part 4) |
| 5 | Hydrocarbons | 20 | TZS 837 (Part 7) |
| 6 | Lead (Pb) | 0.5 | TZS 837 (Part 8) |
| 7 | Chromium (Cr) | 0.5 | |
| 8 | Zinc (Zn) | 0.5 | |
| 9 | Iron (Fe) | 0.5 | BS EN 13211:2001 |
| 10 | Cadmium (Cd) | 0.05 | |
| 11 | Mercury (Hg) | 0.05 | ISO 21741:2020 |

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| 12 | Dioxins & | 0.1 | BS EN 1948-4 |
|----|-----------|-----|--------------|
| | Furans | | |

NOTE:

- 1 All values are in **mg/m³**, dry gas basis @ 273 K, 101.3 kPa and 10% O₂ (stack only). Except for Dioxins and furans which are expressed in nanogram per dry standard cubic meter total equivalent concentration (ng/dscm TEQ)
- 2 Limits are the values not to be exceeded during periodic measurement under normal conditions.
- 3 Where continuous monitoring exists, the limit represents the monthly average exclusive of periods under abnormal conditions.
- 4 Power fluctuation and outage should be treated as abnormal condition.

Since power fluctuation may lead to increased emissions, such peak values occurring during power fluctuation/outage will be deducted in calculation of average values. Proof of power outage shall be required.

4.2 Combustible matter in residue

Unburnt combustibles in the residue from incineration shall be disposed in accordance with the requirements stipulated in various standards related to municipal and industrial solid waste management.

5 Sampling

Sampling shall be done as prescribed in TZS 837 (Part 2) (see clause 2). Where a method of determination describes a different sampling procedure the latter shall prevail.

6 Test methods

Methods of determination shall be done by tests referred to in Table 1. Also see clause 2. Where on-line gas analyser exists, it may be used for the purposes of measurement and monitoring, as long as it is recognized and calibrated. In such cases the other methods are not necessary unless they are used for purposes of calibration or reliance assessment.