

COMMUNIQUE OF THE MINISTRY OF ENVIRONMENT, SOLID WASTE MANAGEMENT AND CLIMATE CHANGE

Proposed Environmental Standards

Pursuant to section 40 of the Environment Protection Act which provides that the Minister shall prescribe standards to protect the quality of air resources, arrangements are underway to repeal the Environment Protection (Standards for Air) Regulations 1998 and replace it by a new set of Regulations to be cited as the Environment Protection (Standards for Ambient Air Quality and Stack Emission) Regulations 20XX, comprising three sets of Standards as follows:

- (i) Environmental standards for ambient air quality;
- (ii) Environmental standards for stack emissions; and
- (iii) Environmental standards for incinerator stack emissions.

In accordance with section 37(5) of the Environment Protection Act, submissions are being invited from stakeholders and members of the public on the proposed environmental standards as follows:

(i) Environmental Standards for Ambient Air Quality

Pollutants	Maximum Limit* ($\mu\text{g}/\text{m}^3$)	Measurement Method**	Averaging Time	Remarks
Total Suspended Particles (TSP)	50	HVS	Annual	For HVS, an annual average for 104 measurements taken twice a week for a period of 24 hours at uniform intervals.
	150		24-hour	The maximum value shall not be exceeded
Particulate Matter (PM_{10})	20	Beta Attenuation or TEOM or HVS or Light Scattering	Annual	For HVS, an annual average for 104 measurements taken twice a week for a period of 24 hours at uniform intervals. For Beta Attenuation or TEOM or Light Scattering, the maximum value shall not be exceeded
Particulate Matter (PM_{10})	50	Beta Attenuation or TEOM or HVS or Light Scattering	24-hour	The maximum value shall not be exceeded

Particulate Matter (PM _{2.5})	10	Beta Attenuation or TEOM or HVS or Light Scattering	Annual	The maximum value shall not be exceeded
	25	Beta Attenuation or TEOM or HVS or Light Scattering	24-hour	The maximum value shall not be exceeded
Sulphur Dioxide (SO ₂)	50	Pulsed Fluorescence or	Annual	The maximum value shall not be exceeded
	150	FTIR or	24-hour	The maximum value shall not be exceeded
	350	Differential Optical Absorption Spectroscopy	one-hour	The maximum value shall not be exceeded
	500		10-minute	The maximum value shall not be exceeded
Nitrogen Dioxide (NO ₂)	40	Chemiluminescence or FTIR or	Annual	The maximum value shall not be exceeded
	200	Differential Optical Absorption Spectroscopy or Cavity Attenuated Phase Shifts (CAPS)	one-hour	The maximum value shall not be exceeded
Carbon Monoxide (CO)	10,000	Non-dispersive Infrared Spectroscopy or FTIR or	8-hour	8-hourly values shall be met 98 per cent of the time in a year and it shall not exceed 2 consecutive days
	25,000	Differential Optical Absorption Spectroscopy	1-hour	The maximum value shall not be exceeded
Lead (Pb)	1.5	High Volume Sampler with Atomic Absorption Spectroscopy(AAS) or Inductively Coupled Plasma Mass Spectrometry (ICPMS)	3-month	An average of at least 2 measurements per week over a period of 3 months.

Ozone (O ₃)	100	Ultraviolet photometry or FTIR or Differential Optical Absorption Spectroscopy	8-hour	The maximum value shall not be exceeded
Elemental Mercury	0.3	Atomic Fluorescence Spectrometry (AFS)	24-hour	The maximum value shall not be exceeded

“FTIR” means Fourier Transform Infrared;

“HVS” means High Volume Sampler;

“TEOM” means Tapered Elemental Oscillating Microbalance.

*Measurements should be corrected to standard values of temperature and pressure at 20 degrees celsius and 101.3 kPa respectively.

**The measurement methods are those as indicated or other equivalent methods recognised by international institutions e.g. United States Environmental Protection Agency (US EPA), Monitoring Certification Scheme for equipment (MCERTS) and as acceptable to the Director. Indicative methods are not acceptable.

Note – For conversion between the 2 gas concentration units $\mu\text{g}/\text{m}^3$ and ppb (parts-per-billion), the conversion formulae are based on the following equations –

$$C1 = (C2 * Mw * 298 * P) / (24.45 * T * 1013);$$

$$C2 = (C1 * 24.45 * T * 1013) / (Mw * 298 * P);$$

where –

C1 = concentration in $\mu\text{g}/\text{m}^3$;

C2 = concentration in ppb;

Mw = molecular weight of compound [g/mol];

P = absolute pressure of air [hPa];

T = temperature of air [K].

(ii) Environmental Standards for Stack Emissions

Pollutants ^{*(a)}	Maximum limit	Applicable to
Smoke	Ringelmann No. 2 or equivalent opacity (not to exceed a shade of density darker than No.2 for more than 5 minutes in any period of one hour)	All stationary fuel burning source
Particulate Matter	100 mg/Nm ³	Single stack

	Total mass of particulate emissions from all stack divided by total volume of such emissions shall not exceed 100 mg/Nm ³	Multiple stacks
Nitrogen Oxides (NO _x) * ^(b)	1,000 mg/Nm ³	All factories and new power plants
	2,000 mg/Nm ³ * ^(c)	Existing Engine – driven power plants
Sulphur Dioxide (SO ₂) * ^(d)	Maximum rate of emission of 200 Kg SO ₂ per day per MWe	New thermal power stations of capacity not exceeding 500 MWe and boiler with a rated capacity of not less than 5 tonnes of steam per hour
	2,000 mg/Nm ³	
Carbon Monoxide (CO)	1,000 mg/Nm ³	All factories and power plants
Mercury and its compounds, expressed as Hg	0.05 mg/Nm ³	All factories, thermal power stations using coal or coal slurry as fuel
Volatile Organic Compounds (VOCs)	20 mg/Nm ³	Ferrous and Non-Ferrous Foundries and Galvanising process in general
	150 mg/Nm ³	Ferrous Foundries using Electric Arc Furnaces
Dioxins and Furans (PCCD/F) using the concept of toxic equivalence (TEQ)	0.1 ng /Nm ³	All factories, thermal power stations using coal or coal slurry as fuel
Nickel (Ni), Cobalt (Co), Chromium (Cr), Tin (Sn) and their compounds	5 mg/Nm ³	All Foundries
Lead (Pb), Cadmium (Cd) and their compounds	2 mg/Nm ³	All Foundries
Hydrogen Chloride	10 mg/Nm ³	All Galvanising activities
Ammonia	50 mg/Nm ³	All Galvanising activities

* (a)

(1) Measurements for particulates shall be reported at 12 per cent CO₂ (carbon dioxide).

- (2) Measurements for gaseous pollutants shall be reported at 15 per cent O₂ (oxygen).
- (3) All emissions measurements shall be reported at normal conditions (273 K and 101.3 KPa and 0 per cent H₂O).
- (4) Methods of measurement shall be reference methods or other equivalent methods in line with international recognised institutions (e.g. US EPA, MCERTS) and as acceptable to the Director.
- * (b) The standard for Nitrogen oxides stipulated are referred to as NO_x, which is expressed in terms of NO₂.
- * (c) Provided the Environment Impact Assessment, air modelling and ambient air quality monitoring proves compliance with ambient NO_x standards.
- * (d) Existing power plants are required to comply with SO₂ limit for ambient air quality and boiler of capacity of less than 5 tonnes of steam per hour are required to comply with both SO₂ limit for ambient air quality and any guidelines for boiler operation.

(iii) Environmental Standards for Incinerator Stack Emissions

Pollutant		Maximum Limit*	Averaging time
Smoke		Ringelmann No. 2 or equivalent opacity (not to exceed a shade of density darker than No.2 for more than 5 minutes in any period of one hour)	Not to exceed more than 5 minutes in any period of one hour
Particulate Matter		10 mg/Nm ³	Daily average or In case duration of incineration is less than 24 hrs; maximum limits are applicable to the incineration duration
Gaseous and Vaporous organic substances, expressed as total organic carbon		10 mg/Nm ³	
Hydrogen Chloride (HCl)		10 mg/Nm ³	
Hydrogen Fluoride (HF)		1 mg/Nm ³	
Carbon Monoxide (CO)		50 mg/Nm ³	
Sulphur Dioxide (SO ₂)		50 mg/Nm ³	
NO _x (expressed as NO ₂) for a new incinerator		200 mg/Nm ³	
NO _x (expressed as NO ₂) for an existing plant	Less than or equal to 6 tons/h	400 mg/Nm ³	
	More than 6 tons/h	200 mg/Nm ³	

Cadmium (Cd) and Thallium (Tl)	0.05 mg/Nm ³	Average over a period of 30 minutes to 8 hours
Mercury (Hg)	0.05 mg/Nm ³	Average over a period of 30 minutes to 8 hours
Total of Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium	0.5 mg/Nm ³	Average over a period of 30 minutes to 8 hours
Dioxins and Furans, using the concept of toxic equivalence (TEQ)	0.1 ng/Nm ³	Average over a period of 6 to 8 hours

* Reference conditions are 273 K, 101.3 kPa, 11 per cent oxygen, 0 per cent H₂O

Note –

(1) Incinerators are required to keep a daily record of the following parameters –

- (a) primary and secondary combustion chamber temperature;
- (b) carbon monoxide concentration in exhaust gas;
- (c) hourly waste charging rate;
- (d) oxygen level;
- (e) record of incineration batch duration;
- (f) amount of resulting ash.

(2) Methods of measurement shall be reference methods or other equivalent methods in line with international recognised institutions (e.g. US EPA, MCERTS) and as acceptable to the Director.

Stakeholders and members of the public are kindly requested to submit their views and comments in writing to the Director of Environment within 1 month from the date this notice is issued, either:

(i) by post to the Director of Environment, Level 2, Ken Lee Tower, Corner Barracks and St Georges Street, Port Louis

or

(ii) by email at airregulations2023@gmail.com.

Details of the proposed standards are also available on the Ministry's website at <https://environment.govmu.org/>

*Ministry of Environment, Solid Waste Management and Climate Change
20 October 2023*