

CIRCULAR

On promulgation of the National Technical Regulation on Industrial Emission

Pursuant to the Law on Standards and Technical Regulations dated June 29, 2006;

Pursuant to the Law on Environmental Protection dated November 17, 2020;

Pursuant to the Government's Decree No. 08/2022/ND-CP dated January 10, 2022, detailing a number of articles of the Law on Environmental Protection;

Pursuant to the Government's Decree No. 127/2007/ND-CP dated August 1, 2007, detailing the implementation of a number of articles of the Law on Standards and Technical Regulations, and the Government's Decree No. 78/2018/ND-CP dated May 16, 2018, amending and supplementing a number of articles of the Government's Decree No. 127/2007/ND-CP, detailing the implementation of a number of articles of the Law on Standards and Technical Regulations;

Pursuant to Government's Decree No. 68/2022/ND-CP dated September 22, 2022, defining the functions, tasks, tasks, powers and organizational structure of the Ministry of Natural Resources and Environment;

At the proposal of the Director of the Pollution Control Department and the Director of the Department of Science and Technology;

The Minister of Natural Resources and Environment hereby promulgates the Circular on promulgation of the National Technical Regulation on Industrial Emission.

Article 1. To promulgate together with this Circular the National Technical Regulation on Industrial Emission (QCVN 19:2024/BTNMT).

Article 2. Effect

1. This Circular takes effect from July 1, 2025.



2. The following National Technical Regulations shall cease to be effective, under the transitional provisions specified in Article 3, and the implementation roadmap specified in Article 4 of this Circular:

a) QCVN 19:2009/BTNMT - National Technical Regulation on Industrial Emission of Inorganic Substances and Dusts, QCVN 20:2009/BTNMT - National Technical Regulation on Industrial Emission of Organic Substances, QCVN 21:2009/BTNMT - National Technical Regulation on Emission of Chemical Fertilizer Manufacturing Industry, QCVN 22:2009/BTNMT - National Technical Regulation on Emission of Thermal Power Industry, QCVN 23:2009/BTNMT - National Technical Regulation on Emission of Cement Manufacturing Industry (promulgated together with Circular No. 25/2009/TT-BTNMT dated November 16, 2009, of the Minister of Natural Resources and Environment, on national technical regulations on the environment);

b) QCVN 34:2010/BTNMT - National technical Regulation on Emission of Refining and Petrochemical Industry of Inorganic Substances and Dusts (promulgated together with Circular No. 42/2010/TT-BTNMT dated December 29, 2010, of the Minister of Natural Resources and Environment, on national technical regulations on the environment);

c) QCVN 51:2017/BTNMT - National Technical Regulation on Emission for Steel Industry (promulgated together with Circular No. 78/2017/TT-BTNMT dated December 29, 2017, of the Minister of Natural Resources and Environment, on national technical regulations on the environment).

3. The Tables stipulating the permissible maximum values of pollution parameters in emission in the following national technical regulations shall cease to be effective pursuant to the transitional provisions specified in Article 3, and the implementation roadmap specified in Article 4 of this Circular:

a) Table 1 and Table 4 of QCVN 41:2011/BTNMT - National Technical Regulation on Co-processing of Hazardous Waste in Cement Kiln (promulgated together with Circular No. 44/2011/TT-BTNMT dated December 26, 2011, of the Minister of Natural Resources and Environment, on national technical regulations on the environment);

b) Table 2 of QCVN 02:2012/BTNMT - National Technical Regulation on Solid Health Care Waste Incinerator (promulgated together with Circular No. 27/2012/TT-BTNMT dated December 28, 2012, of the Minister of Natural Resources and Environment, on national technical regulations on the environment);

c) Table 4 of QCVN 56:2013/BTNMT - National Technical Regulation on Waste Oil Recycling (promulgated together with Circular No. 57/2013/TT-BTNMT dated December 31, 2013, of the Minister of Natural Resources and

Environment, on promulgation of national technical regulations on the environment);

c) Table 2 of QCVN 61-MT:2016/BTNMT - National Technical Regulation on Domestic Solid Waste Incinerator (promulgated together with Circular No. 03/2016/TT-BTNMT dated October 10, 2016, of the Minister of Natural Resources and Environment, on promulgation of national technical regulations on the environment).

4. In cases where environmental zoning has not yet been determined, Column B as provided in Table 1 and Table 2 of QCVN 19:2024/BTNMT shall apply.

Article 3. Transitional provisions

1. Facilities already in operation and investment projects that have obtained decisions approving the results of environmental impact assessment report appraisal or have had their complete and valid dossiers for appraisal of environmental impact assessment reports, issuance of environmental licenses, or environmental registration received by competent state agencies (hereinafter referred to collectively as ongoing investment projects) prior to the effective date of this Circular shall continue to apply national technical regulations on emissions corresponding to their respective production, business, or service types and the regulations of local authorities (including local technical regulations on emissions) until the end of December 31, 2031.

2. In case competent state agencies promulgate regulations relating to changes in regional or area coefficients (Kv), the entities specified in Clause 1 of this Article shall implement such changes according to the roadmap prescribed by the competent state agencies upon promulgation of such regulations.

Article 4. Roadmap for application

1. From the effective date of this Circular, investment projects (including new investment projects, investment projects for expansion of scale or enhancement of capacity of which the dossiers for appraisal of environmental impact assessment reports, issuance of environmental licenses, or environmental registration are submitted after the effective date of this Circular) shall comply with the provisions of QCVN 19:2024/BTNMT.

2. From January 1, 2032, the cases specified in Clause 1, Article 3 of this Circular must comply with the requirements stipulated in QCVN 19:2024/BTNMT, unless the provincial-level People's Committee promulgates an earlier implementation roadmap.

3. Entities specified in Clause 1, Article 3 of this Circular are encouraged to apply the provisions of QCVN 19:2024/BTNMT from the effective date of this Circular.

Article 5. Implementation organization

1. Ministries, ministerial-level agencies, People's Committees at all levels, provincial-level Department of Natural Resources and Environment, and related organizations and individuals shall implement this Circular.

2. Any problems arising in the course of implementation of this Circular should be promptly reported in writing to the Ministry of Natural Resources and Environment for review and settlement./.

**FOR THE MINISTER
THE DEPUTY MINISTER**

Le Cong Thanh

LuatVietnam.vn



THE SOCIALIST REPUBLIC OF VIETNAM

QCVN 19:2024/BTNMT

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**NATIONAL TECHNICAL REGULATION ON INDUSTRIAL
EMISSION**

HANOI - 2024

Preface

QCVN 19:2024/BTNMT was prepared by the Pollution Control Department, submitted for approval by the Department of Science and Technology, appraised by the Ministry of Science and Technology and promulgated by the Minister of Natural Resources and Environment under Circular No./2024/TT-BTNMT dated, 2024.

QCVN 19:2024/BTNMT replaces the following Regulations:

QCVN 19:2009/BTNMT - National Technical Regulation on Industrial Emission of Inorganic Substances and Dusts;

QCVN 20:2009/BTNMT - National Technical Regulation on Industrial Emission of Organic Substances;

QCVN 21:2009/BTNMT - National Technical Regulation on Emission of Chemical Fertilizer Manufacturing Industry;

QCVN 22:2009/BTNMT - National Technical Regulation on Emission of Thermal Power Industry;

QCVN 23:2009/BTNMT - National Technical Regulation on Emission of Cement Manufacturing Industry;

QCVN 34:2010/BTNMT - National technical Regulation on Emission of Refining and Petrochemical Industry of Inorganic Substances and Dusts;

QCVN 51:2017/BTNMT - National Technical Regulation on Emission for Steel Industry.

Permissible limit values of pollutant parameters specified in Table 1 and Table of **QCVN 19:2024/BTNMT** replace the permissible maximum values of pollution parameters in emission prescribed in:

Table 1 and Table 4 of QCVN 41:2011/BTNMT - National Technical Regulation on Co-processing of Hazardous Waste in Cement Kiln;

Table 2 of QCVN 02:2012/BTNMT - National Technical Regulation on Solid Health Care Waste Incinerator;

Table 2 of QCVN 30:2012/BTNMT - National Technical Regulation on Industrial Waste Incinerator;

Table 4 of QCVN 56:2013/BTNMT - National Technical Regulation on Waste Oil Recycling;

Table 2 of QCVN 61-MT:2016/BTNMT - National Technical Regulation on Domestic Solid Waste Incinerator.

NATIONAL TECHNICAL REGULATION ON INDUSTRIAL EMISSION

1. GENERAL PROVISIONS

1.1. Scope of regulation

1.1.1. This Regulation stipulates the permissible limit values of pollutant parameters in industrial emissions discharged into the ambient air environment.

1.1.2. This Regulation does not apply to the emission discharge activities of transport vehicles.

1.2. Subjects of application

This Regulation applies to competent state management agencies in charge of environment; organizations and individuals involved in activities of discharging industrial emissions into the ambient air environment.

1.3. Interpretation of terms

In this Regulation, the terms below are construed as follows:

1.3.1. *Industrial emission* means a mixture of particulate and gaseous matter generated during the processes of production, business, or service activities.

1.3.2. *Gaseous matter* means substances in gaseous or vapor form generated during combustion, synthesis, decomposition of materials, or arising from the physical properties of substances.

1.3.3. *Particulate matter* means fine solid or liquid substances generated during processes such as grinding, classification, accumulation, mixing, mechanical treatment, combustion, synthesis, or decomposition of materials.

1.3.4. *Dust (PM)* means particulate matter suspended in or settling from the air.

1.3.5. *Industrial emission discharge equipment* means a source of industrial emission discharge, including structures, machinery, equipment, or equivalent objects that discharge industrial emissions into the ambient air through chimneys or exhaust pipes.

1.3.6. *Industrial emission-discharging facility* means an investment project, production, business, or service facility having one or more pieces of industrial emission discharge equipment.

1.3.7. *Fuel* means materials in solid, liquid, or gaseous form used directly or after processing as combustibles.

1.3.8. *Solid biomass fuel* means fuel derived from agricultural and forestry sources, including crop by-products; by-products arising from the processing of

natural wood; production of products from natural wood, bamboo, or neohouzeaua; and used natural wood products that do not contain hazardous waste constituents exceeding the thresholds prescribed in regulations on waste management (such as: straw, rice husks, wood scraps, sawdust, wood shavings, wood powder, wood pellets, coconut fiber, cashew residue, bagasse, tree roots, crop hulls, and similar by-products).

1.3.9. *Biogas* means a gas mixture originating from the decomposition of organic waste under the influence of bacteria in an anaerobic environment.

1.3.10. *Standard emission cubic meter (Nm³)* means the cubic meter of emission at a temperature of 25°C and an absolute pressure of 760 mmHg.

1.3.11. *Reference oxygen content (%)* in industrial emission means the standard excess oxygen content determined during the combustion process of different types of fuel under standard conditions.

1.3.12. *Capacity of industrial emission discharge equipment* means the total capacity of equipment of the same type using the same fuel at an industrial emission-discharging facility.

1.3.13. *Column A, Column B, and Column C* in Table 1 and Table 2 of this Regulation are defined as follows:

1.3.13.1. *Column A* stipulates the permissible limit values of pollutant parameters in industrial emissions from industrial emission-discharging facilities located in strictly protected zones.

1.3.13.2. *Column B* stipulates the permissible limit values of pollutant parameters in industrial emissions from industrial emission-discharging facilities located in emission-restricted zones.

1.3.13.3. *Column C* stipulates the permissible limit values of pollutant parameters in industrial emissions from industrial emission-discharging facilities not falling under the cases specified in Clauses 1.3.13.1 and 1.3.13.2 of this Regulation.

2. TECHNICAL PROVISIONS

2.1. Permissible limit values of pollutant parameters in “gaseous form” in industrial emissions discharged into the ambient air environment.

Based on the environmental zoning prescribed in Section 1.3.13 of this Regulation, the permissible limit values of pollutant parameters in “gaseous form” in industrial emissions discharged into the ambient air environment are provided in Table 1:

Table 1. Permissible limit values of pollutant parameters in “gaseous form”

No.	Pollutant parameter	Unit	Industrial emission discharge equipment	A	B	C
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1.	Ammonia (NH₃)	mg/Nm ³	1. Fertilizer and nitrogen compound production equipment	≤ 15	≤ 25	≤ 30
			2. Inorganic dye and pigment production equipment	≤ 15	≤ 25	≤ 30
			3. Waste incineration equipment and furnaces	≤ 15 (12)	≤ 20 (12)	≤ 25 (12)
			4. Clinker kilns in cement production (including co-processing of waste)	≤ 15 (13)	≤ 25 (13)	≤ 30 (13)
			5. Coke ovens in coke production	≤ 15 (7)	≤ 20 (7)	≤ 25 (7)
			6. Flue gas treatment systems using Selective Catalytic Reduction (SCR) or Selective Non-Catalytic Reduction (SNCR) of emission discharge equipment other than the five types mentioned above	≤ 15	≤ 20	≤ 25
			7. Other emission discharge equipment	≤ 15	≤ 20	≤ 25
2.	Carbon Monoxide (CO)	mg/Nm ³	1. Thermal oil heaters, industrial boilers (excluding waste incineration)			
			1.1. Equipment using liquid fuel			
			1.1.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 200 (4)	≤ 300 (4)	≤ 350 (4)

		1.1.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 250 (4)	≤ 350 (4)	≤ 400 (4)
		1.2. Equipment using solid fuel			
		1.2.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 250 (6)	≤ 350 (6)	≤ 400 (6)
		1.2.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 300 (6)	≤ 400 (6)	≤ 450 (6)
		1.3. Equipment using solid biomass fuel	≤ 200 (6)	≤ 300 (6)	≤ 350 (6)
		1.4. Equipment using gaseous fuel	≤ 80 (4)	≤ 100 (4)	≤ 120 (4)
		2. Waste incineration equipment and furnaces			
		2.1. Incinerators with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)	≤ 120 (12)	≤ 180 (12)	≤ 200 (12)
		2.2. Incinerators with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)	≤ 150 (12)	≤ 200 (12)	≤ 250 (12)
		3. CO combustion equipment in refined	≤ 250 (12)	≤ 300 (12)	≤ 350 (12)

			petroleum product manufacturing (refining, petrochemicals)			
			4. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products (excluding the sintering stage)			
			4.1. Blast furnace (BF)	≤ 130 (7)	≤ 180 (7)	≤ 230 (7)
			4.2. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), reheating furnace, melting furnace	≤ 130	≤ 180	≤ 230
			5. Kilns (including reheating furnaces, dryers) in the production of cement, lime, gypsum, and products made from cement, lime, gypsum; kilns (including reheating furnaces, dryers, melting furnaces) in the production of other non-metallic mineral products	≤ 150 (13)	≤ 250 (13)	≤ 300 (13)
			6. Coke ovens in coke production	≤ 130 (7)	≤ 180 (7)	≤ 230 (7)
			7. Cremation furnaces	≤ 250 (12)	≤ 300 (12)	≤ 350 (12)



			8. Other equipment using solid biomass fuel	≤ 200 (6)	≤ 300 (6)	≤ 350 (6)
			9. Other emission discharge equipment	≤ 300	≤ 400	≤ 450
3.	Hydrogen chloride acid (HCl)	mg/Nm ³	1. Equipment for production and recycling of hydrogen chloride acid (including equipment for hydrogen chloride and hypochlorous acid recovery)	≤ 6	≤ 8	≤ 10
			2. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			2.1. Sintering furnaces, sintering machines (Sinter)	≤ 4 (15)	≤ 5 (15)	≤ 7 (15)
			2.2. Blast furnace (BF)	≤ 4 (7)	≤ 5 (7)	≤ 7 (7)
			2.3. Equipment for degreasing and surface treatment	≤ 4	≤ 5	≤ 7
			3. Waste incineration equipment and furnaces			
			3.1. Incinerators with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)	≤ 20 (12)	≤ 25 (12)	≤ 30 (12)
			3.2. Incinerators with combustion capacity	≤ 25 (12)	≤ 30 (12)	≤ 35 (12)

			under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)			
			4. Kilns and melting furnaces in the production of glass and glass products (for fiberglass production using pure oxygen, reference oxygen content not applicable)	≤ 3 (13)	≤ 4 (13)	≤ 5 (13)
			5. Kilns in the production of cement, lime, gypsum and products made from cement, lime, gypsum; kilns and melting furnaces in the production of other non- metallic mineral products	≤ 15 (13)	≤ 20 (13)	≤ 25 (13)
			6. Condensation equipment, acid etching equipment, and surface treatment equipment in semiconductor and electronic component manufacturing	≤ 6	≤ 8	≤ 10
			7. Coke ovens in coke production	≤ 4 (7)	≤ 5 (7)	≤ 7 (7)
			8. Cremation furnaces	≤ 30 (12)	≤ 30 (12)	≤ 30 (12)
			9. Other emission discharge equipment	≤ 10	≤ 15	≤ 20
4.	Sulfur dioxide (SO ₂)	mg/Nm ³	1. Thermal oil heaters, industrial boilers (excluding waste incineration)			

		1.1. Equipment using liquid fuel			
		1.1.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 200 (4)	≤ 300 (4)	≤ 350 (4)
		1.1.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 250 (4)	≤ 350 (4)	≤ 400 (4)
		1.2. Equipment using solid fuel			
		1.2.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 200 (6)	≤ 300 (6)	≤ 350 (6)
		1.2.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 250 (6)	≤ 350 (6)	≤ 400 (6)
		1.3. Equipment using solid biomass fuel	≤ 130 (6)	≤ 200 (6)	≤ 250 (6)
		1.4. Equipment using gaseous fuel	≤ 90 (4)	≤ 120 (4)	≤ 150 (4)
		1.5. Equipment using biogas	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		2. Equipment in power plants and electricity generation facilities			
		2.1. Equipment using liquid fuel (with			

		capacity from 1 MW or more)			
		2.1.1. Internal combustion engines and gas turbines for electricity generation	≤ 120 (15)	≤ 200 (15)	≤ 250 (15)
		2.1.2. Other electricity generation equipment	≤ 120 (4)	≤ 200 (4)	≤ 250 (4)
		2.2. Equipment using solid fuel			
		2.2.1. Total capacity over 1,200 MW	≤ 120 (6)	≤ 180 (6)	≤ 200 (6)
		2.2.2. Total capacity over 300 MW to 1,200 MW	≤ 120 (6)	≤ 220 (6)	≤ 250 (6)
		2.2.3. Total capacity of 300 MW or less	≤ 120 (6)	≤ 250 (6)	≤ 300 (6)
		2.3. Equipment using solid biomass fuel	≤ 130 (6)	≤ 200 (6)	≤ 250 (6)
		2.4. Equipment using gaseous fuel			
		2.4.1. Internal combustion engines and gas turbines for electricity generation, with total capacity over 1,200 MW	≤ 50 (15)	≤ 60 (15)	≤ 70 (15)
		2.4.2. Internal combustion engines and gas turbines for electricity generation, with total capacity over 300 MW to 1,200 MW	≤ 50 (15)	≤ 70 (15)	≤ 80 (15)
		2.4.3. Internal combustion engines and gas turbines for electricity generation,	≤ 50 (15)	≤ 80 (15)	≤ 90 (15)

		with total capacity of 300 MW or less			
		2.4.4. Equipment using recovered gas from coke ovens in coke production, carbon black production, and other related production activities	≤ 180 (6)	≤ 200 (6)	≤ 250 (6)
		2.4.5. Equipment using biogas	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		2.4.6. Other electricity generation equipment	≤ 100 (4)	≤ 120 (4)	≤ 150 (4)
		3. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
		3.1. Sintering furnaces, sintering machines (Sinter)	≤ 150 (15)	≤ 250 (15)	≤ 300 (15)
		3.2. Blast furnace (BF)	≤ 150 (7)	≤ 250 (7)	≤ 300 (7)
		3.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), reheating furnace, melting furnace, other combustion equipment	≤ 150	≤ 250	≤ 300
		4. Equipment for sulfuric acid production	≤ 300 (8)	≤ 350 (8)	≤ 400 (8)

		in basic inorganic chemical manufacturing			
		5. Equipment for mixing, reaction, purification, concentration, and heating in fertilizer and nitrogen compound production	≤ 250	≤ 300	≤ 350
		6. Equipment for refined petroleum product manufacturing (refining and petrochemical)			
		6.1. Tail gas incinerators	≤ 200 (4)	≤ 250 (4)	≤ 300 (4)
		6.2. Heating equipment	≤ 200 (4)	≤ 250 (4)	≤ 300 (4)
		6.3. CO incinerators	≤ 200 (12)	≤ 250 (12)	≤ 300 (12)
		7. Heating equipment in basic organic chemical production	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		8. Equipment for coal gasification fuel production			
		8.1. Drying equipment	≤ 100 (8)	≤ 150 (8)	≤ 200 (8)
		8.2. Combustion equipment	≤ 200 (7)	≤ 250 (7)	≤ 350 (7)
		8.3. Sulfur recovery equipment	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		8.4. Sulfuric acid production equipment	≤ 250 (8)	≤ 300 (8)	≤ 350 (8)
		9. Coke ovens in coke production	≤ 200 (7)	≤ 250 (7)	≤ 300 (7)

		10. Waste incineration equipment and furnaces			
		10.1. Equipment with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)	≤ 80 (12)	≤ 100 (12)	≤ 150 (12)
		10.2. Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)	≤ 100 (12)	≤ 120 (12)	≤ 180 (12)
		11. Kilns, dryers, and heating furnaces in the production of cement and cement-based products	≤ 80 (13)	≤ 100 (13)	≤ 120 (13)
		12. Kilns, dryers, and heating furnaces in the production of lime, gypsum, and products made from lime and gypsum; ceramic, porcelain production and related products	≤ 80 (13)	≤ 100 (13)	≤ 130 (13)
		13. Kilns and melting furnaces in the production of glass and glass products (for fiberglass production using pure oxygen, reference oxygen content not applicable)	≤ 250 (13)	≤ 300 (13)	≤ 350 (13)
		14. Cremation furnaces	≤ 150 (12)	≤ 200 (12)	≤ 250 (12)

			15. Other equipment using solid biomass fuel	≤ 200 (6)	≤ 250 (6)	≤ 300 (6)
			16. Other emission discharge equipment	≤ 200	≤ 300	≤ 350
5.	Nitrogen oxide (Nox, calculated according to NO₂)	mg/Nm ³	1. Thermal oil heaters, industrial boilers (excluding waste incineration)			
			1.1. Equipment using liquid fuel			
			1.1.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 200 (4)	≤ 300 (4)	≤ 350 (4)
			1.1.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 250 (4)	≤ 400 (4)	≤ 450 (4)
			1.2. Equipment using solid fuel			
			1.2.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 200 (6)	≤ 300 (6)	≤ 350 (6)
			1.2.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 250 (6)	≤ 400 (6)	≤ 450 (6)
			1.3. Equipment using solid biomass fuel	≤ 150 (6)	≤ 250 (6)	≤ 300 (6)
			1.4. Equipment using gaseous fuel	≤ 70 (4)	≤ 120 (4)	≤ 150 (4)

		1.5. Equipment using biogas	≤ 150 (4)	≤ 250 (4)	≤ 300 (4)
		2. Equipment in power plants and power generation facilities			
		2.1. Equipment using liquid fuel (with capacity from 1 MW or more)			
		2.1.2. Internal combustion engines and gas turbines for electricity generation	≤ 150 (15)	≤ 250 (15)	≤ 300 (15)
		2.1.2. Other electricity generation equipment	≤ 150 (4)	≤ 250 (4)	≤ 300 (4)
		2.2. Equipment using solid fuel			
		2.2.1. Total capacity over 1,200 MW	≤ 120 (6)	≤ 180 (6)	≤ 200 (6)
		2.2.2. Total capacity over 300 MW to 1,200 MW	≤ 120 (6)	≤ 220 (6)	≤ 250 (6)
		2.2.3. Total capacity of 300 MW or less	≤ 120 (6)	≤ 250 (6)	≤ 300 (6)
		2.3. Equipment using solid biomass fuel	≤ 150 (6)	≤ 250 (6)	≤ 300 (6)
		2.4. Equipment using gaseous fuel			
		2.4.1. Internal combustion engines and gas turbines for electricity generation, with total capacity over 1,200 MW	≤ 50 (15)	≤ 70 (15)	≤ 90 (15)
		2.4.2. Internal combustion engines and gas turbines for electricity generation,	≤ 50 (15)	≤ 90 (15)	≤ 110 (15)

		with total capacity over 300 MW to 1,200 MW			
		2.4.3. Internal combustion engines and gas turbines for electricity generation, with total capacity of 300 MW or less	≤ 70 (15)	≤ 120 (15)	≤ 150 (15)
		2.4.4. Equipment using recovered gas from coke ovens in coke production, carbon black production, and other related production activities	≤ 180 (6)	≤ 200 (6)	≤ 250 (6)
		2.4.5. Lean-burn gas engines not using biogas	≤ 80 (15)	≤ 100 (15)	≤ 150 (15)
		2.4.6. Lean-burn gas engines using biogas	≤ 180 (15)	≤ 200 (15)	≤ 250 (15)
		2.4.7. Equipment using biogas	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		2.4.8. Other electricity generation equipment	≤ 70 (4)	≤ 120 (4)	≤ 150 (4)
		3. Waste incineration equipment and furnaces			
		3.1. Equipment with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)	≤ 180 (12)	≤ 250 (12)	≤ 300 (12)
		3.2. Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)	≤ 200 (12)	≤ 300 (12)	≤ 350 (12)

		4. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
		4.1. Sintering furnaces, sintering machines (Sinter)	≤ 150 (15)	≤ 250 (15)	≤ 300 (15)
		4.2. Blast furnace (BF)	≤ 150 (7)	≤ 250 (7)	≤ 300 (7)
		4.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), reheating furnace, melting furnace, other combustion equipment	≤ 150	≤ 250	≤ 300
		5. Equipment for refined petroleum product manufacturing (refining and petrochemical)			
		5.1. Heating equipment	≤ 150 (4)	≤ 250 (4)	≤ 300 (4)
		5.2. CO incinerators	≤ 150 (12)	≤ 200 (12)	≤ 250 (12)
		6. Equipment for basic organic chemical production			
		6.1. Heating equipment using liquid or gaseous fuel	≤ 150 (4)	≤ 250 (4)	≤ 300 (4)

		6.2. CO incinerators	≤ 150 (12)	≤ 200 (12)	≤ 250 (12)
		7. Kilns and melting furnaces in the production of glass and glass products (for fiberglass production using pure oxygen, reference oxygen content not applicable)	≤ 200 (13)	≤ 300 (13)	≤ 350 (13)
		8. Kilns, dryers, and heating furnaces in the production of cement and cement-based products	≤ 200 (13)	≤ 350 (13)	≤ 400 (13)
		9. Kilns, dryers, and heating furnaces in the production of lime, gypsum, and products made from lime and gypsum; ceramic, porcelain production and related products	≤ 200 (13)	≤ 350 (13)	≤ 400 (13)
		10. Equipment for coal gasification fuel production			
		10.1. Drying equipment	≤ 200 (8)	≤ 250 (8)	≤ 300 (8)
		10.2. Combustion equipment	≤ 200 (7)	≤ 300 (7)	≤ 350 (7)
		10.3. Sulfur recovery equipment	≤ 250 (4)	≤ 300 (4)	≤ 350 (4)
		10.4. Sulfuric acid production equipment	≤ 200 (8)	≤ 300 (8)	≤ 350 (8)
		11. Coke ovens in coke production	≤ 200 (7)	≤ 250 (7)	≤ 300 (7)
		12. Cremation furnaces	≤ 200 (12)	≤ 250 (12)	≤ 300 (12)

			13. Other equipment using solid biomass fuel	≤ 200 (6)	≤ 300 (6)	≤ 350 (6)
			14. Heating equipment in fertilizer production and inorganic chemical manufacturing	≤ 250	≤ 400	≤ 450
			15. Other emission discharge equipment	≤ 250	≤ 400	≤ 500
6.	Hydrogen sulfide (H₂S)	mg/Nm ³	1. Waste incineration equipment and furnaces			
			1.1. <i>Equipment with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)</i>	≤ 3 (12)	≤ 3 (12)	≤ 4 (12)
			1.2. <i>Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)</i>	≤ 3 (12)	≤ 4 (12)	≤ 5 (12)
			2. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 3 (13)	≤ 5 (13)	≤ 8 (13)
			3. Heating equipment, sulfur dioxide (SO ₂) treatment equipment, and tail gas incinerators in refined petroleum product manufacturing (refining, petrochemicals) and basic organic chemical production	≤ 4 (4)	≤ 5 (4)	≤ 6 (4)

			4. Equipment for coal gasification fuel production			
			4.1. Sulfur recovery equipment	≤ 4 (4)	≤ 6 (4)	≤ 8 (4)
			4.2. Sulfuric acid production equipment	≤ 4 (8)	≤ 6 (8)	≤ 8 (8)
			5. Coke ovens in coke production	≤ 2 (7)	≤ 2.5 (7)	≤ 3.0 (7)
			6. Other emission discharge equipment	≤ 6	≤ 7	≤ 8
7.	Fluorine (F) and fluorine compounds (calculated as fluoride)	mg/Nm ³	1. Kilns and melting furnaces in the production of ceramics, porcelain, and related products	≤ 2 (13)	≤ 3 (13)	≤ 3 (13)
			2. Equipment for wet-process phosphoric acid production, compound fertilizer production, ammonium superphosphate production, phosphate or fluorite calcining and melting equipment, equipment for fluorine compound production in basic inorganic chemical manufacturing; chemical fertilizer and nitrogen compound production	≤ 2	≤ 3	≤ 3
			3. Waste incineration equipment and furnaces			
			3.1. Equipment with combustion capacity from 2 tons/hour or more (from 0.2	≤ 2 (12)	≤ 3 (12)	≤ 4 (12)

		tons/hour or more for medical waste incinerators)			
		3.2. Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)	≤ 3 (12)	≤ 4 (12)	≤ 5 (12)
		4. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 2 (13)	≤ 3 (13)	≤ 4 (13)
		5. Surface treatment equipment (including condensation and acid etching equipment) in the production of metal products, semiconductors, and electronic component products	≤ 3	≤ 3	≤ 4
		6. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
		6.1. Sintering furnaces, sintering machines (Sinter)	≤ 4 (15)	≤ 6 (15)	≤ 7 (15)
		6.2. Blast furnace (BF)	≤ 4 (7)	≤ 6 (7)	≤ 7 (7)
		6.3. Equipment for degreasing and surface treatment	≤ 3	≤ 3	≤ 4

			7. Coke ovens in coke production	≤ 2 (13)	≤ 3 (7)	≤ 4 (7)
			8. Other emission discharge equipment	≤ 2	≤ 3	≤ 4
8.	Mercury (Hg) and mercury compounds (calculated as Hg)	mg/Nm ³	1. Waste incineration equipment and furnaces	≤ 0.05 (12)	≤ 0.05 (12)	≤ 0.08 (12)
			2. Electricity generation equipment using solid fuel (power plants and electricity generation facilities)	≤ 0.04 (6)	≤ 0.04 (6)	≤ 0.05 (6)
			3. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			3.1. Sintering furnaces, sintering machines (Sinter)	≤ 0.04 (15)	≤ 0.04 (15)	≤ 0.05 (15)
			3.2. Blast furnace (BF)	≤ 0.04 (7)	≤ 0.04 (7)	≤ 0.05 (7)
			3.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF)	≤ 0.04	≤ 0.04	≤ 0.05
			4. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 0.04 (13)	≤ 0.05 (13)	≤ 0.08 (13)
			5. Coke ovens in coke production	≤ 0.04 (7)	≤ 0.04 (7)	≤ 0.05 (7)

			6. Other emission discharge equipment	≤ 0.05	≤ 0.1	≤ 0.1
9.	Volatile organic compounds (calculated as TVOC, including components: Benzene, Toluene, Ethylbenzene, Xylene, Ethyl Acetate, Butyl Acetate)	mg/Nm ³	1. Painting and surface coating equipment (including drying equipment and spray painting, putty painting, dipping painting equipment)	≤ 50	≤ 80	≤ 100
			2. Printing equipment	≤ 50	≤ 80	≤ 100
			3. Equipment for manufacturing paint, varnish and similar coating substances; manufacturing of printing ink and printing paste; manufacturing of adhesive	≤ 80	≤ 120	≤ 150
			4. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 30 (13)	≤ 30 (13)	≤ 40 (13)
			5. Surface treatment equipment, grease cleaning equipment	≤ 50	≤ 80	≤ 100
			6. Waste incineration equipment and furnaces	≤ 30 (12)	≤ 40 (12)	≤ 50 (12)
			7. Equipment in the production of natural rubber or synthetic rubber	≤ 80	≤ 100	≤ 150
			8. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			

			8.1. Sintering furnaces, sintering machines (Sinter)	≤ 10 (15)	≤ 12 (15)	≤ 15 (15)
			8.2. Blast furnace (BF)	≤ 10 (7)	≤ 12 (7)	≤ 15 (7)
			8.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF)	≤ 10	≤ 12	≤ 15
			9. Coke ovens in coke production	≤ 10 (7)	≤ 12 (7)	≤ 15 (7)
			10. Other emission equipment (excluding internal combustion engines using natural gas fuel, not applicable)	≤ 80	≤ 120	≤ 150
10. Dioxin/Furan		ngTEQ/ Nm ³	1. Equipment for the production and casting of iron, steel, and cast iron			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 0.05 (15)	≤ 0.1 (15)	≤ 0.2 (15)
			1.2. Electric arc furnace (EAF), induction furnace (medium-frequency furnace)	≤ 0.05	≤ 0.1	≤ 0.2
			2. Furnaces for roasting and melting in the production of aluminum and aluminum products	≤ 0.05	≤ 0.3	≤ 0.4
			3. Furnaces for roasting and melting in the production of copper and copper products	≤ 0.05	≤ 0.3	≤ 0.4

		4. Furnaces for roasting and melting in the production of zinc, zinc recovery	≤ 0.05	≤ 0.3	≤ 0.4
		5. Waste incineration equipment and furnaces			
		5.1. <i>Equipment with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for medical waste incinerators)</i>	≤ 0.2 (12)	≤ 0.2 (12)	≤ 0.3 (12)
		5.2. <i>Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)</i>	≤ 0.3 (12)	≤ 0.3 (12)	≤ 0.4 (12)
		6. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 0.2 (13)	≤ 0.2 (13)	≤ 0.3 (13)
		7. Equipment for refined petroleum product manufacturing (refining and petrochemical) (production stages of products containing chlorides such as vinyl chloride or ethylene dichloride, etc.)	≤ 0.05	≤ 0.08	≤ 0.1
		8. Other emission equipment (specialized equipment in waste treatment, co-processing of waste, or types of production with the	≤ 0.2	≤ 0.3	≤ 0.4

			potential to generate Dioxin/Furan)			
11.	Hydrogen cyanide (HCN)	mg/Nm ³	Exhaust gas combustion equipment in acrylonitrile production; other emission equipment	≤ 8	≤ 9	≤ 10
12.	Arsenic (As) and Arsenic compounds, expressed in As	mg/Nm ³	Other emission discharge equipment	≤ 2	≤ 3	≤ 4
13.	Chlorine (calculated as Cl₂)	mg/Nm ³	1.1. Chlorine production equipment	≤ 4	≤ 6	≤ 8
			1.2. Other emission discharge equipment	≤ 4	≤ 5	≤ 6
14.	Sulfuric acid vapor (H₂SO₄)	mg/Nm ³	1.1. Sulfuric acid production equipment	≤ 10	≤ 30	≤ 35
			1.2. Other emission discharge equipment	≤ 10	≤ 20	≤ 25
15.	Bromine (Br) and bromine compounds (calculated as Br₂)	mg/Nm ³	Equipment for the production and use of chemicals containing bromine; other emission equipment	≤ 10	≤ 10	≤ 15
16.	Carbon disulfide (CS₂)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 30	≤ 35	≤ 40
17.	Acrylonitrile (C₃H₃N)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 6	≤ 7	≤ 8

18.	Acetaldehyde (CH₃CHO)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 50	≤ 100	≤ 150
19.	Aniline (C₆H₅NH₂)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 10	≤ 15	≤ 18
20.	Benzene (C₆H₆)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), production of refined petroleum products (refining, petrochemical); other emission equipment	≤ 4	≤ 5	≤ 5
21.	Benzyl chloride (C₆H₅CH₂Cl)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 4	≤ 5	≤ 5
22.	1,3-Butadiene (C₄H₆)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 15	≤ 20	≤ 25

23.	Butylamine ($\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{NH}_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 10	≤ 15	≤ 15
24.	Cresol ($\text{CH}_3\text{C}_6\text{H}_4\text{OH}$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 15	≤ 20	≤ 20
25.	Chloroform (CHCl_3)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 25	≤ 30	≤ 30
26.	β-Chloroprene ($\text{CH}_2=\text{CClCH}=\text{CH}_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 30	≤ 40	≤ 50
27.	Diethylamine ($(\text{C}_2\text{H}_5)_2\text{NH}$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 30	≤ 40	≤ 50
28.	Dichloromethane (CH_2Cl_2)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and	≤ 170	≤ 200	≤ 250

			chemicals used); other emission equipment			
29.	1,1-Dichloroethane (CHCl_2CH_3)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 50	≤ 60	≤ 80
30.	1,2-Dichloroethene (ClCH=CHCl)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 50	≤ 60	≤ 80
31.	1,4-Dioxane ($\text{C}_4\text{H}_8\text{O}_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 100	≤ 150	≤ 200
32.	Dimethylaniline ($\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 15	≤ 20	≤ 25
33.	Dimethyl sulfate ($(\text{CH}_3)_2\text{SO}_4$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 0.3	≤ 0.4	≤ 0.5
34.	Ethylamine ($\text{CH}_3\text{CH}_2\text{NH}_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals	≤ 30	≤ 35	≤ 40

			(depending on the type of product and chemicals used); other emission equipment			
35.	Ethylbenzene (CH₃CH₂C₆H₅)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), production of refined petroleum products (refining, petrochemical), plastic recycling; other emission equipment	≤ 100	≤ 120	≤ 150
36.	Ethyl acrylate (CH₂=CHCOOC₂H₅)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 60	≤ 70	≤ 80
37.	Ethylene oxide (CH₂OCH₂)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 10	≤ 15	≤ 15
38.	Formaldehyde (HCHO)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 10	≤ 15	≤ 20
39.	Methyl mercaptan (CH₃SH)	mg/Nm ³	Equipment for the production and use of organic chemicals	≤ 10	≤ 12	≤ 15

			(depending on the type of product and chemicals used); other emission equipment			
40.	Methyl acrylate (CH₂=CHCOOCH₃)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 20	≤ 30	≤ 35
41.	Methanol (CH₃OH)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 100	≤ 150	≤ 200
42.	Methyl bromide (CH₃Br)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 60	≤ 70	≤ 80
43.	Methyl chloride (CH₃Cl)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 100	≤ 120	≤ 150
44.	Nitrobenzene (C₆H₅NO₂)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 3	≤ 4	≤ 5

45.	Phenol and phenolic compounds (C_6H_5OH)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 15	≤ 15	≤ 15
46.	Propylene oxide (C_3H_6O)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 30	≤ 40	≤ 50
47.	Styrene ($C_6H_5CH=CH_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 100	≤ 100	≤ 100
48.	1,1,2,2-Tetrachloroethane ($Cl_2HCCHCl_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 20	≤ 25	≤ 30
49.	Carbon tetrachloride (CCl_4)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 20	≤ 30	≤ 40
50.	Toluene ($C_6H_5CH_3$)	mg/Nm ³	Equipment for the production and use of organic chemicals	≤ 30	≤ 40	≤ 50

			(depending on the type of product and chemicals used), production of refined petroleum products (refining, petrochemical), plastic recycling; other emission equipment			
51.	Trichloroethylene ($\text{ClCH}=\text{CCl}_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 80	≤ 90	≤ 100
52.	1,1,2-Trichloroethane ($\text{CHCl}_2\text{CH}_2\text{Cl}$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used); other emission equipment	≤ 100	≤ 150	≤ 200
53.	Xylene ($\text{C}_6\text{H}_4(\text{CH}_3)_2$)	mg/Nm ³	Equipment for the production and use of organic chemicals (depending on the type of product and chemicals used), plastic recycling; other emission equipment	≤ 50	≤ 100	≤ 150
54.	Vinyl chloride ($\text{CH}_2=\text{CHCl}$)	mg/Nm ³	1. Polymerization and copolymerization reaction equipment in the production of ethylene dichloride, vinyl chloride, and polyvinyl chloride (PVC)	≤ 20	≤ 20	≤ 20

		2. Heating and extrusion equipment in the production of PVC plastic products	≤ 20	≤ 20	≤ 20
		3. Other emission discharge equipment	≤ 25	≤ 30	≤ 30

Note:

- The values in parentheses “()” in Columns A, B, and C of this Table are the reference oxygen content values.
- The mercury and dioxin/furan values prescribed in this Table 1 include both gaseous and particulate forms.
- The dioxin/furan values are calculated according to the provisions of Appendix 2 of this Regulation.

2.2. Permissible limit values for particulate pollutant parameters in industrial emissions discharged into the ambient air environment

Based on the environmental zoning specified in Section 1.3.13 of this Regulation, the permissible limit values for particulate pollutant parameters in industrial emissions discharged into the ambient air environment are prescribed in Table 2:

Table 2. Permissible limit values for particulate pollutant parameters

No.	Pollutant parameter	Unit	Industrial emission discharge equipment	A	B	C
1	Particulate matter (PM)	mg/Nm ³	1. Thermal oil heaters, industrial boilers (excluding waste incineration)			
			1.1. Equipment using liquid fuel			
			1.1.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 30 (4)	≤ 40 (4)	≤ 50 (4)
			1.1.2. Equipment with steam capacity under 20 tons/hour or more, or	≤ 30 (4)	≤ 45 (4)	≤ 55 (4)

			thermal capacity under 12,380,000 Kcal/hour			
			1.2. Equipment using solid fuel			
			1.2.1. Equipment with steam capacity from 20 tons/hour or more, or thermal capacity from 12,380,000 Kcal/hour or more	≤ 30 (6)	≤ 40 (6)	≤ 50 (6)
			1.2.2. Equipment with steam capacity under 20 tons/hour or more, or thermal capacity under 12,380,000 Kcal/hour	≤ 40 (6)	≤ 50 (6)	≤ 60 (6)
			1.3. Equipment using solid biomass fuel	≤ 40 (6)	≤ 50 (6)	≤ 60 (6)
			1.4. Equipment using gaseous fuel	≤ 20 (4)	≤ 20 (4)	≤ 30 (4)
			1.5. Equipment using biogas	≤ 20 (4)	≤ 25 (4)	≤ 35 (4)
			2. Equipment in power plants and power generation facilities			
			2.1. Equipment using liquid fuel (with capacity from 1 MW or more)			
			2.1.1. Internal combustion engines and gas turbines for electricity generation	≤ 20 (15)	≤ 25 (15)	≤ 30 (15)
			2.1.2. Other electricity generation equipment	≤ 20 (4)	≤ 25 (4)	≤ 30 (4)
			2.2. Equipment using solid fuel			
			2.2.1. Total capacity over 1,200 MW	≤ 20 (6)	≤ 30 (6)	≤ 35 (6)

		2.2.2. Total capacity over 300 MW to 1,200 MW	≤ 20 (6)	≤ 30 (6)	≤ 35 (6)
		2.2.3. Total capacity of 300 MW or less	≤ 25 (6)	≤ 35 (6)	≤ 45 (6)
		2.3. Equipment using solid biomass fuel	≤ 25 (6)	≤ 40 (6)	≤ 50 (6)
		2.4. Equipment using gaseous fuel			
		2.4.1. Internal combustion engines and gas turbines for electricity generation, with total capacity over 1,200 MW	≤ 15 (15)	≤ 15 (15)	≤ 20 (15)
		2.4.2. Internal combustion engines and gas turbines for electricity generation, with total capacity over 300 MW to 1,200 MW	≤ 15 (15)	≤ 15 (15)	≤ 20 (15)
		2.4.3. Internal combustion engines and gas turbines for electricity generation, with total capacity of 300 MW or less	≤ 15 (15)	≤ 15 (15)	≤ 20 (15)
		2.4.4. Equipment using recovered gas from coke ovens in coke production, carbon black production, and other related production activities	≤ 20 (6)	≤ 30 (6)	≤ 40 (6)
		2.4.5. Other electricity generation equipment	≤ 20 (4)	≤ 30 (4)	≤ 40 (4)
		3. Waste incineration equipment and furnaces			
		3.1. Equipment with combustion capacity from 2 tons/hour or more (from 0.2 tons/hour or more for	≤ 30 (12)	≤ 40 (12)	≤ 45 (12)

			medical waste incinerators)			
			3.2. Equipment with combustion capacity under 2 tons/hour (under 0.2 tons/hour for medical waste incinerators)	≤ 35 (12)	≤ 45 (12)	≤ 50 (12)
			4. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			4.1. Sintering furnaces, sintering machines (Sinter)	≤ 20 (15)	≤ 30 (15)	≤ 35 (15)
			4.2. Blast furnace (BF)	≤ 20 (7)	≤ 30 (7)	≤ 35 (7)
			4.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle furnace (LF), casting equipment, and other equipment	≤ 20	≤ 30	≤ 35
			5. Furnace for roasting and drying in the production of chemical fertilizers and nitrogen compounds	≤ 30 (7)	≤ 40 (7)	≤ 50 (7)
			6. Coke production equipment			
			6.1. Coke production equipment			
			6.1.1. Coke oven	≤ 20 (7)	≤ 30 (7)	≤ 35 (7)

		6.1.2. Other emission discharge equipment	≤ 20	≤ 30	≤ 35
		6.2. Petroleum coke production equipment			
		6.2.1. Combustion equipment	≤ 20 (4)	≤ 30 (4)	≤ 35 (4)
		6.2.2. Other emission discharge equipment	≤ 20	≤ 30	≤ 35
		7. Equipment for refined petroleum product manufacturing (refining and petrochemical) and basic organic chemical production equipment			
		7.1. Tail gas incinerators	≤ 20 (4)	≤ 30 (4)	≤ 35 (4)
		7.2. Heating equipment and catalyst regeneration equipment	≤ 20 (4)	≤ 30 (4)	≤ 35 (4)
		7.3. CO incinerators	≤ 30 (12)	≤ 30 (12)	≤ 35 (12)
		7.4. Other dust treatment equipment	≤ 30	≤ 30	≤ 35
		8. Equipment for coal gasification fuel production			
		8.1. Drying equipment	≤ 30 (8)	≤ 40 (8)	≤ 50 (8)
		8.2. Combustion equipment	≤ 30 (7)	≤ 40 (7)	≤ 50 (7)
		8.3. Sulfur recovery equipment	≤ 30 (4)	≤ 40 (4)	≤ 60 (4)
		8.4. Sulfuric acid production equipment	≤ 30 (8)	≤ 40 (8)	≤ 50 (8)
		8.5. Other dust treatment equipment	≤ 30	≤ 40	≤ 50

			9. Kilns and melting furnaces in the production of glass and glass products (for fiberglass production using pure oxygen, reference oxygen content not applicable)			
			9.1. Continuous annealing furnace or electric furnace (excluding the above-mentioned open/closed electric furnaces)	≤ 30 (13)	≤ 40 (13)	≤ 50 (13)
			9.2. Other melting furnaces	≤ 30	≤ 40	≤ 50
			10. Equipment in the production of ceramics and ceramic products	≤ 30 (13)	≤ 40 (13)	≤ 50 (13)
			10.1. Furnace for firing and melting	≤ 30 (13)	≤ 40 (13)	≤ 50 (13)
			10.2. Other dust treatment equipment	≤ 30	≤ 40	≤ 50
			11. Equipment for the production of cement, lime, gypsum, and products made from cement, lime, gypsum			
			11.1. Clinker kiln, heating and drying equipment	≤ 20 (13)	≤ 25 (13)	≤ 30 (13)
			11.2. Grinding, cooling equipment, and other devices	≤ 20	≤ 35	≤ 40
			12. Equipment for asbestos production, insulating wool in the production of non-metallic mineral products	≤ 30	≤ 40	≤ 50

			13. Painting equipment (spray painting, putty powder, dip coating), including drying equipment	≤ 30	≤ 40	≤ 50
			14. Surface treatment equipment (including condensation and acid etching equipment) in the production of semiconductors, and electronic component products	≤ 30	≤ 40	≤ 50
			15. Metal surface treatment equipment	≤ 30	≤ 40	≤ 50
			16. Cremation furnaces	≤ 50 (12)	≤ 60 (12)	≤ 70 (12)
			17. Other equipment using solid biomass fuel	≤ 40 (6)	≤ 50 (6)	≤ 60 (6)
			18. Other emission discharge equipment	≤ 50	≤ 80	≤ 100
2	Lead (Pb) and compounds, expressed in Pb	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 0.9 (15)	≤ 1.2 (15)	≤ 1.5 (15)
			1.2. Blast furnace (BF)	≤ 0.9 (7)	≤ 1.2 (7)	≤ 1.5 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle	≤ 0.9	≤ 1.2	≤ 1.5

			refining furnace (LF), melting furnace			
			2. Coke ovens in coke production	≤ 0.9 (7)	≤ 1.2 (7)	≤ 1.5 (7)
			3. Other emission- generating equipment (excluding waste incineration and co- processing of waste, which are calculated based on total metals)	≤ 0.8	≤ 1	≤ 1
3	Cadmium (Cd) and Cd compounds (calculated as Cd)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non- ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 0.1 (15)	≤ 0.15 (15)	≤ 0.2 (15)
			1.2. Blast furnace (BF)	≤ 0.1 (7)	≤ 0.15 (7)	≤ 0.2 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 0.1	≤ 0.15	≤ 0.2
			2. Coke ovens in coke production	≤ 0.1 (7)	≤ 0.15 (7)	≤ 0.2 (7)
			3. Other emission- generating equipment (excluding waste incineration and co- processing of waste, which are calculated based on total metals)	≤ 0.2	≤ 0.2	≤ 0.2

4	Chromium (Cr) and Cr compounds (calculated as Cr)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 1 (15)	≤ 2 (15)	≤ 2.5 (15)
			1.2. Blast furnace (BF)	≤ 1 (7)	≤ 2 (7)	≤ 2.5 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 1	≤ 2	≤ 2.5
			2. Coke ovens in coke production	≤ 1 (7)	≤ 2 (7)	≤ 2.5 (7)
			3. Other emission-generating equipment (excluding waste incineration and co-processing of waste, which are calculated based on total metals)	≤ 0.5	≤ 1	≤ 2
5	Copper (Cu) and Cu compounds (calculated as Cu)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 4 (15)	≤ 5 (15)	≤ 6 (15)

			1.2. Blast furnace (BF)	≤ 4 (7)	≤ 5 (7)	≤ 6 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 4	≤ 5	≤ 6
			2. Other emission-generating equipment (excluding waste incineration and co-processing of waste, which are calculated based on total metals)	≤ 4	≤ 5	≤ 6
6	Nickel (Ni) and Ni compounds (calculated as Ni)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 0.5 (15)	≤ 1 (15)	≤ 1.2 (15)
			1.2. Blast furnace (BF)	≤ 0.5 (7)	≤ 1 (7)	≤ 1.2 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 0.5	≤ 1	≤ 1.2
			2. Coke ovens in coke production	≤ 0.5 (7)	≤ 1 (7)	≤ 1.2 (7)
			3. Other emission-generating equipment	≤ 1	≤ 2	≤ 2

			(excluding waste incineration and co-processing of waste, which are calculated based on total metals)			
7	Zinc (Zn) and Zn compounds (calculated as Zn)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 8 (15)	≤ 10 (15)	≤ 12 (15)
			1.2. Blast furnace (BF)	≤ 8 (7)	≤ 10 (7)	≤ 12 (7)
			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 8	≤ 10	≤ 12
			2. Other emission discharge equipment	≤ 6	≤ 7	≤ 8
8	Antimony (Sb) and Sb compounds (calculated as Sb)	mg/Nm ³	1. Equipment for the production and casting of iron, steel, pig iron; non-ferrous metal production and casting; manufacturing of fabricated metal products			
			1.1. Sintering furnaces, sintering machines (Sinter)	≤ 5 (15)	≤ 6 (15)	≤ 8 (15)
			1.2. Blast furnace (BF)	≤ 5 (7)	≤ 6 (7)	≤ 8 (7)

			1.3. Electric arc furnace (EAF), induction furnace (medium-frequency furnace), basic oxygen furnace (BOF), ladle refining furnace (LF), melting furnace	≤ 5	≤ 6	≤ 8
			2. Other emission-generating equipment (excluding waste incineration and co-processing of waste, which are calculated based on total metals)	≤ 5	≤ 6	≤ 8
9	Total metals Cd, Tl and corresponding compounds	mg/Nm ³	1. Waste incineration equipment and furnaces	≤ 0.05 (12)	≤ 0.05 (12)	≤ 0.05 (12)
			2. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 0.05 (13)	≤ 0.05 (13)	≤ 0.05 (13)
10	Total metals (including Sb, As, Pb, Cr, Co, Cu, Mn, Ni, V and corresponding compounds)	mg/Nm ³	1. Waste incineration equipment and furnaces	≤ 0.5 (12)	≤ 0.5 (12)	≤ 0.5 (12)
			2. Clinker kilns in cement production (only apply in case of co-processing of waste)	≤ 0.5 (13)	≤ 0.5 (13)	≤ 0.5 (13)
11	Polycyclic aromatic hydrocarbons – PAH (calculated as Benzo[a]pyrene equivalent)	mg/Nm ³	1. Coke ovens in coke production	≤ 0.05 (7)	≤ 0.06 (7)	≤ 0.08 (7)
			2. Other emission discharge equipment	≤ 0.05	≤ 0.1	≤ 0.1
12	Smoke opacity	Ringelmann scale value	All emission-generating equipment	≤ 2	≤ 2	≤ 2
Note:						

- The values in parentheses “()” specified in Columns A, B, and C of this Table are the reference oxygen content values.
- The value of Polycyclic Aromatic Hydrocarbons – PAH (calculated as Benzo[a]pyrene equivalent) specified in this Table 2 (including both gaseous and particulate forms) is calculated in accordance with the provisions set out in Appendix 3 of this Regulation.

3. METHOD OF DETERMINATION

3.1. The methods for determining pollution parameters in industrial emissions (including on-site measurement, sampling, and laboratory analysis methods) shall be conducted in accordance with the provisions set forth in Appendix 1 of this Regulation.

In cases where a pollution parameter permits the use of multiple measurement, sampling, and testing (analysis) methods and requires an arbitration method to resolve disputes, complaints, or lawsuits, the first-listed method in Columns 3 and 4 of Appendix 1 of this Regulation shall be used.

3.2. Approval is granted for other measurement, sampling, and testing methods (not referenced in Columns 3 and 4 of Appendix 1 of this Regulation), including Newly issued Vietnamese National Standards (TCVN); national standard methods of any countries in the Group of Seven (G7), European Committee for Standardization (CEN/EN), American Society for Testing and Materials (ASTM), member countries of the European Union, South Korea, or International Organization for Standardization (ISO).

3.3. The use of direct measuring devices prescribed in Column 3 of Appendix 1 of this Regulation must meet the technical requirements for environmental monitoring as stipulated by law.

4. MANAGEMENT PROVISIONS

4.1. The pollution parameters and the permissible limit values of pollution parameters for industrial emission discharge equipment of investment projects and industrial emission-discharging facilities must be specified in the Decision approving the appraisal results of the environmental impact assessment report, the environmental license, or the environmental registration document.

4.2. The pollution parameters required to be controlled for industrial emission discharge equipment of investment projects and industrial emission-discharging facilities must be stipulated in the Decision approving the appraisal results of the environmental impact assessment report and the environmental license, including:

4.2.1. Pollution parameters specifically regulated according to the type of industrial emission discharge equipment as provided in Tables 1 and 2 of this Regulation.

4.2.2. One or several pollution parameters listed in Tables 1 and 2 of this Regulation that have not been specifically regulated according to the type of industrial emission discharge equipment.

4.2.3. New characteristic pollution parameters not yet regulated in Tables 1 and 2 of this Regulation, in cases where the investment project or facility has technology or equipment generating new characteristic pollution parameters.

4.3. For investment projects or facilities with technology or equipment generating new characteristic pollution parameters not regulated in Tables 1 and 2 of this Regulation, the permissible limit values for those characteristic pollution parameters shall be applied according to the national environmental protection standards of one of the countries in the Group of Seven (G7).

4.4. Industrial emissions discharged into the ambient air shall be assessed as compliant and conforming to this Regulation when the monitoring and analytical results of pollution parameters do not exceed the permissible limit values prescribed in Tables 1 and 2 of this Regulation (or do not exceed the permissible limit values according to the national environmental protection standards of one of the countries in the Group of Seven (G7) in the case of newly generated characteristic pollution parameters as prescribed in Section 4.2.3 of this Regulation).

4.5. The method for assessing compliance and conformity with this Regulation shall be conducted through monitoring and analyzing emission samples prior to the discharge into the ambient air.

4.6. The monitoring and analysis of pollution parameters prescribed in Tables 1 and 2 of this Regulation, which provide information and data to state management agencies, must be performed by organizations granted the certificate of eligibility for environmental monitoring services in accordance with the law. The monitoring and analysis of new characteristic pollution parameters stipulated in Section 4.2.3 of this Regulation shall be conducted by organizations granted the certificate of registration for testing activities pursuant to Decree No. 107/2016/ND-CP dated July 1, 2016, of the Government, prescribing conditions for provision of conformity assessment services. The use of automatic, continuous emission monitoring results shall be conducted in accordance with law.

4.7. The results of the compliance and conformity assessment with this Regulation shall serve as the basis for state management agencies to consider and handle in accordance with laws.

5. RESPONSIBILITIES OF ORGANIZATIONS AND INDIVIDUALS

5.1. The project owner and industrial emission-discharging facilities shall be responsible for ensuring that the values of pollutant parameters do not exceed the permissible limits prescribed in Tables 1 and 2 of this Regulation.

5.2. The project owner and facilities shall be responsible for determining the pollutant parameters of industrial emission discharge equipment in accordance with the principles stipulated in Section 4.2 of this Regulation based on the following grounds: Information on the type of production, business, services; industrial emission discharge equipment; production technology, waste treatment technology; raw materials, materials, fuels, chemicals used; and the list of potentially arising pollutant parameters (proposed in the dossiers for appraisal of environmental impact assessment reports, dossiers for issuance, modification, or re-issuance of environmental license).

5.3. The competent agency responsible for appraising the environmental impact assessment report and issuing the environmental license shall specifically determine the pollutant parameters to be controlled based on the proposals of the project owner and the facility in the dossiers for appraisal of the environmental impact assessment report and for issuance, modification, or re-issuance of the environmental license. In the event that other pollutant parameters are detected exceeding the permissible limits prescribed in Tables 1 and 2 of this Regulation, additional control measures shall be implemented in accordance with regulations.

6. IMPLEMENTATION ORGANIZATION

6.1. The provincial-level People's Committee shall be responsible for reviewing and adjusting the locally issued environmental technical standards on industrial emissions to ensure conformity with legal regulations, the local socio-economic development situation, and this Regulation.

6.2. The state management agency in charge of environmental protection shall be responsible for guiding and inspecting the implementation of this Regulation.

6.3. In case any documents and provisions referred to in this Regulation are amended, supplemented or replaced, the new ones shall prevail./.

** All Appendices are not translated herein.*