

EU provisional position based on ECE/EB.AIR/WG.2009/21 as amended by ECE/EB.AIR/WG.5/2011/2. Strikeout means provisions proposed to be deleted and bold underlined proposed amendment to text.

## Annex VII

### LIMIT VALUES FOR EMISSIONS OF ~~[TOTAL SUSPENDED PARTICULATES]/~~ PARTICULATE MATTER ~~[DUST]~~ FROM STATIONARY SOURCES

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1. Section A applies to Parties other than Canada and the United States of America, section B applies to Canada and section C applies to the United States of America.

#### A. Parties other than Canada and the United States of America

2. For the purpose of ~~section A~~ **this section, "emission limit value" (ELV)** means the quantity of a ~~solid substance~~ **dust** contained in the waste gases from an installation that is not to be exceeded. Unless otherwise specified, it shall be calculated in terms of mass of pollutant per volume of the waste gases (expressed as mg/m<sup>3</sup>), assuming standard conditions for temperature and pressure for dry gas (volume at 273.15 K, 101.3 kPa). With regard to the oxygen content of ~~exhaust waste~~ **gas**, the values given in the tables below for each source category shall apply. Dilution for the purpose of lowering concentrations of pollutants in waste gases is not permitted. ~~In the context of this protocol, dust and TSP have the same meaning. As can be seen from table 8 in the guidance document on general issues, abatement techniques for dust in general provide also a high removal efficiency for PM<sub>2.5</sub> and PM<sub>10</sub>. Start-up, shutdown and maintenance of equipment are excluded.~~

3. Emissions shall be monitored<sup>1</sup> in all cases **via measurements or through calculations achieving at least the same accuracy.** Compliance with limit values shall be verified **through** ~~The methods of verification can include~~ continuous or discontinuous measurements, type approval, or any other technically sound method. In case of continuous measurements, compliance with the **limit value** ~~standards~~ is achieved if the validated ~~{daily/monthly}~~ **monthly** emission average does not exceed the **emission** limit values. In case of discontinuous measurements or other appropriate determination procedures, compliance with the emission **limit value** ~~standards~~ is achieved if the mean value based on an appropriate number of measurements under representative conditions does not exceed the value of the emission standard. The inaccuracy of ~~the continuous and discontinuous~~ measurement methods may be taken into account for verification purposes.

4. ~~Sampling and analysis~~ **Monitoring** of relevant polluting substances and measurements of

<sup>1</sup> ~~Monitoring is to be understood as an overall activity, comprising measuring or calculating of emissions, mass-balancing, etc. It can be carried out continuously or discontinuously.~~

process parameters, as well as the quality assurance of automated measuring systems and the reference measurement methods to calibrate those systems shall be carried out in accordance with CEN standards. If CEN standards are not available, ISO standards, national or international standards, which will ensure the provision of data of an equivalent scientific quality, shall apply.

5. Special provisions for combustion plants ~~referred to in paragraph 7 with a rated thermal input exceeding 50 MWth and for combustion plants when combined to a common stack with a total rated input exceeding 50 MWth:~~

5.1 The competent authority may grant derogation from the obligation to comply with the emission limit values provided for in paragraph 7 in the following cases:

[a) for combustion plants ~~only/mainly~~ **normally** using gaseous fuel who have to resort exceptionally to the use of other fuels because of a sudden interruption in the supply of gas and for this reason would need to be equipped with a waste gas purification facility]

[b) for **existing** combustion plants not operated more than ~~XXX~~ **17 500** operating hours, starting from ~~DATE~~ **1 January 2016** and ending no later than ~~DATE~~ **31 December 2023**DATE.

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5.2 Where a combustion plant is extended by at least 50MW, the emission limit value specified in paragraph 7 for new installations shall apply to the extensional part ~~and to the plant~~ affected by the change.

5.3 Parties shall ensure that provisions are made in the permits for procedures relating to malfunction or breakdown of the abatement equipment.

5.4 In the case of a multi-fuel firing combustion plant involving the simultaneous use of two or more fuels, the competent authority shall **determine the emission limit value as the weighted average of the emission limit values for the individual fuels, on the basis of the thermal input delivered by each fuel.**~~provide rules for setting the emission limit values.~~

~~6. Mineral oil refineries complying with the overall dust limit value set in table 1 may be exempted from compliance with the individual limit values provided in this annex. Following alternative bubble dust limit value may be used, referring to the sum of the emissions from all combustion plants and process installations expressed as an average concentration and at a reference oxygen content of 3%.~~

~~Table 1. Suggested options for Limit values for particulate matter emissions released from refineries using the bubble concept~~

Emission source	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
Mineral oil refinery	30	<u>50</u>	100

7. Combustion plants (boilers and process heaters) with a rated thermal input exceeding 50 MW<sup>th</sup> or combustion plants when combined to a common stack with a total rated input exceeding 50 MW<sup>th</sup>:

**Table 2. Suggested options for Limit values for dust emissions released from boilers and process heaters combustion plants<sup>a/</sup>**

Fuel type	Thermal input [MW <sup>th</sup> ]	ELV for dust [mg/Nm <sup>3</sup> ] <sup>b/</sup>			
		Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>	
Solid fuels	50-100	New plants: 10 (coal, lignite) 10 (biomass, peat)	<u>New plants:</u> <b>20 (coal, lignite and other solid fuels)</b> <b>20 (biomass, peat)</b>	New plants: 50 (coal, lignite) 50 (biomass, peat)	Formatted: Highlight
		Existing plants: 15 (coal, lignite) 15 (biomass, peat)	<u>Existing plants:</u> <b>30 (coal, lignite and other solid fuels)</b> <b>30 (biomass, peat)</b>	Existing plants: 50 (coal, lignite) 50 (biomass, peat)	Formatted: Highlight
	100-300	New plants: 10 (coal, lignite) 10 (biomass, peat)	<u>New plants:</u> <b>20 (coal, lignite and other solid fuels)</b> <b>20 (biomass, peat)</b>	New plants: 30 (coal, lignite) 30 (biomass, peat)	Formatted: Highlight
		Existing plants: 15 (coal, lignite) 10 (biomass, peat)	<u>Existing plants:</u> <b>25 (coal, lignite and other solid fuels)</b> <b>20 (biomass, peat)</b>	Existing plants: 50 (coal, lignite) 50 (biomass, peat)	Formatted: Highlight
	>300	New plants: 10 (coal, lignite) 10 (biomass, peat)	<u>New plants:</u> <b>10 (coal, lignite and other solid fuels)</b> <b>20 (biomass, peat)</b>	New plants: 30 (coal, lignite) 30 (biomass, peat)	Formatted: Highlight

<sup>2</sup> **The rated thermal input of the combustion plant is calculated as the sum of the input of all units connected to a common stack.** Individual combustion plants units below 15 MW<sup>th</sup> shall not be considered when calculating to calculate the total rated input.

		Existing plants: 10 (coal, lignite) 10 (biomass, peat)	<u>Existing plants:</u> <b>20 (coal, lignite and other solid fuels)</b> <b>20 (biomass, peat)</b>	Existing plants: 50 (coal, lignite) 50 (biomass, peat)
Liquid fuels	50-100	New plants: 40	New plants: <u>20</u>	New plants: 50
		Existing plants: 45	Existing plants: <u>30 (in general)</u>	Existing plants: <b><u>50 for the firing of distillation and conversion residues from the refining of crude oil for own consumption in combustion plants</u></b>
	100-300	New plants: 40	New plants: <u>20</u>	New plants: 30
		Existing plants: 45	Existing plants: <u>25 (in general)</u>	Existing plants: <b><u>50 for the firing of distillation and conversion residues from the refining of crude oil for own consumption in combustion plants</u></b>
	>300	New plants: 5	New plants: <u>10</u>	New plants: 30
		Existing plants: 40	Existing plants: <u>20 (in general)</u>	Existing plants: <b><u>50 for the firing of distillation and conversion residues from the refining of crude oil for own consumption in combustion plants</u></b>
Natural gas	>50	5	<u>5</u>	5
<b><u>Other gases</u></b>	<b><u>≥ 50</u></b>		<b><u>10</u></b> <b><u>30 for gases produced by the steel</u></b>	

			<u>industry which can be used elsewhere</u>	
Combustion plants in refineries using distillation and conversion residues for own use	>50	10	<u>New plants</u> 20	50
				<u>Existing plants</u> 50

a/ In particular, the limit values shall not apply to:

- Plant where the combustion process is an integrated part of a specific production, for example the coke oven used in the Iron and Steel industry and glass and ceramics production plants;
- Plant in which the products of combustion are used for direct heating, drying, or any other treatment of objects or materials;
  - Post-combustion plants designed to purify the waste gases by combustion which are not operated as independent combustion plants;
  - Facilities for the regeneration of catalytic cracking catalysts;
  - Facilities for the conversion of hydrogen sulphide into sulphur;
  - Reactors used in the chemical industry;
  - Coke battery furnaces;
  - Cowpers;
  - ~~Recovery boilers for black liquor~~ within installations for the production of pulp
  - Waste incinerators; and
  - Plant powered by diesel, petrol or gas engines or by combustion turbines, irrespective of the fuel used.

b/ ~~These values do not apply to combustion plants running less than 500 hours a year.~~ The O<sub>2</sub> reference content is 6% for solid fuels and 3% for others liquid and gaseous fuels

8. Mineral oil and gas refineries

**Table 3. Limit values for dust emissions released from mineral oil and gas refineries**

Emission source	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
FCC regenerators	20	<u>50</u> 40	200

Oxygen reference: dry basis, 3% for combustion, 15 % for gas turbines.

9. Cement clinker production:

**Table 4. Limit values for dust emissions released from cement production<sup>a/</sup>**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
<u>Cement installations kilns, mills and clinker coolers</u>	45	<u>20</u>	50

a/ Installations for the production of cement clinker in rotary kilns with a capacity >500 Mg/day or in other furnaces with a capacity >50 Mg/day. The reference **oxygen** content is 10 %.

10. Lime production:

**Table 5. Limit values for dust emissions released from lime production<sup>a/</sup>**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
Lime production <u>kiln firing</u>	45	<u>20</u> <sup>b/</sup>	30

a/ Installations for the production of lime with a capacity of 50 tonnes/day or more. This includes lime kilns integrated in other industrial processes, with the exception of the pulp industry (see table 10). The reference oxygen content is 11 %.

b/ Where the resistivity of the dust is high, the ELV may be higher, up to 30 mg/Nm<sup>3</sup>.

11. Production and processing of metals:

**Table 6. Limit values for dust emissions released from primary iron and steel production**

<u>Activity and capacity threshold</u>	ELV for dust[mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/b/</sup>
Sinter plant (>150 t/day)	15 <sup>a/</sup>	50 <sup>a/</sup>	50 <sup>-</sup>
Pelletization plant (>150 t/day)	5 <sup>a/</sup>	<u>10<sup>a/</sup> 20 for crushing, grinding and drying</u>  <u>15 for all other process steps</u>	25
Blast furnace: Hot stoves (>2.5 t/hour)	5 <sup>a/</sup>	10 <sup>a/</sup>	50
Basic oxygen steelmaking and casting (>2.5 t/hour)	10 <sup>a/</sup>	30 <sup>a/</sup>	50
Electric steelmaking and casting (>2.5 t/hour)	10 (existing) 5 (new)	15 (existing) 5 (new)	20

a/ As an exemption to paragraph 3, these ELVs should be considered as monthly averages

b/ Based on the heavy metal protocol based on a daily average

**Table 7. Limit values for dust emissions released from iron foundries**

<u>Activity and capacity threshold</u>	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/b/</sup>
Iron foundries (>20 t/day): - all furnaces (cupola, induction, rotary) - all mouldings (lost, permanent)	10	20	50
Hot and cold rolling	10	20 <u>50 where a bag filter cannot be</u>	30

		<u>applied due to the presence of wet fumes</u>	
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**Table 8. Limit values for dust emissions released from non ferrous metals production and processing**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	[daily]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/b/</sup>
non ferrous metal processing <sup>a/</sup>	-	-	-
<del>- fabric filters, ceramic filters:</del>	<del>{3}</del>	<del>{5}</del>	<del>20</del>
<del>- electrostatic precipitators:</del>	7	12	20
<del>- scrubbers:</del>	10	20	20

~~a/ The choice of abatement technique depends on local conditions, cross-media effects, geographical location and technical characteristics of the plant. Socio-economics need also to be considered. The preferred technique for dust abatement is the use of a fabric filter or a ceramic filter. Electrostatic precipitators should be used for gases containing too much moist, for hot gases, or when the PM is too sticky. Scrubbers should be used as the temperature or the nature of the gases precludes the use of other techniques, or when gaseous elements or acids have to be removed simultaneously with dust.~~

12. Glass production:

**Table 9. Limit values for dust emissions released from glass production<sup>a/</sup>**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
New installations	10	<del>30</del> 20	50
Existing installations	15	30	50



**a/ Installations for the production of glass or glass fibres with a capacity of 20 tonnes/day or more.** For combustion gases: **Concentrations refer to dry waste gases at 8 % oxygen by volume (continuous melting), 13 % oxygen by volume (discontinuous melting).**

13. Pulp production:

**Table 10. Limit values for dust emissions released from pulp production**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	<u>(annual averages)</u>		
	<b>Option 1<sup>1/</sup></b>	<b>Option 2<sup>1/</sup></b>	<b>Option 3<sup>1/</sup></b>
Auxiliary boiler	25	<u>40 when firing liquid fuels (at 3% oxygen content)</u> <u>30 when firing solid fuels (at 6% oxygen content)</u>	40
Recovery boiler and lime kiln	40	<u>50</u>	80

14. Waste incineration:

**Table 11. Limit values for dust emissions released from waste incineration**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	<b>Option 1<sup>1/</sup></b>	<b>Option 2<sup>1/</sup></b>	<b>Option 3<sup>1/</sup></b>
Municipal waste incineration plants (> 3 tonnes/hour)	3	5	<u>10</u>
Hazardous and medical waste incineration (> 1 tonne/hour)	3	5	<u>10</u>

Oxygen reference: dry basis, 11%.

15. Titanium dioxide production:

**Table 12. Limit values for dust emissions released from titanium dioxide production**

	ELV for dust [mg/Nm <sup>3</sup> ]		
	Option 1 <sup>1/</sup>	Option 2 <sup>1/</sup>	Option 3 <sup>1/</sup>
Sulphate process, total emission	12	20	<u>50</u>
Chloride process, total emission	20	35	<u>50</u>

**For minor emission sources within an installation, an emission limit value of 150 mg/m<sup>3</sup> may be applied**

*[The EU proposes to move paragraph 16 into a separate Annex or separate part of this annex, with a non-mandatory character and to select one option, which could be in the ambitious range (1 to 2) as a recommendation.]*

16. Small combustion installations with a rated thermal input < 50 MWth:

**1. Small combustion installations with a rated thermal input < [300] [500] kW:**

(a) Emissions from new residential combustion stoves and boilers with a rated thermal input < [300] [500] kWth can be reduced by the application of:

(i) Product standards as described in CEN standards (e.g., EN 303–5) and equivalent product standards in the United States and Canada. Countries applying such product standards may define additional national requirements **taking into account in particular the contribution of emissions of condensable organic compounds to the formation of ambient particulate matter**. Table 13 is recommending options for additional ELVs for dust for wood combustion appliances;

(ii) Ecolabels specifying performance criteria that are typically stricter than the minimum efficiency requirements of the EN product standards or national regulations.

**Table 13: Limit values for dust emissions released from new small wood combustion installations with a rated thermal input < [300] [500] kWth to be used with product standards. (O2 reference content: 13%).**

<b>Particulate matter concentration Dust (mg/Nm<sup>3</sup>)</b>	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
Open / closed fireplaces	40	75	110
Wood stoves	40	75	110
Log wood boilers (with heat storage tank)	20	40	110
Pellet stoves and boilers	20	40	110
Automatic combustion plants	20	50	110

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(b) Emissions from existing residential combustion stoves and boilers can be reduced by the following primary measures:<sup>3</sup>

<sup>3</sup> Paragraph 16.A.2 (a)–(c) has a recommendatory character and might be deferred to the Guidance Document.

- (i) By public information and awareness-raising programmes regarding:
  - a. The proper operation of stoves and boilers;
  - b. The use of untreated wood only;
  - c. The correct seasoning of wood for moisture content;
- (ii) By establishing a programme to promote the replacement of the oldest existing boilers and stoves by modern appliances; or
- (iii) By establishing an obligation to exchange or retrofit old appliances.

**2. Combustion installations with a rated thermal input [50] [70] [100] kWth–1 MWth**

**Table 14: Limit values for dust emissions released from boilers [and process heaters] with a rated thermal input of [50] [70] [100] kWth–1 MWth. (O<sub>2</sub> reference content: wood, other solid biomass and peat: 13%; Coal, lignite and other fossil solid fuels: 6%)**

<del>Particulate matter</del> concentration Dust (mg/Nm <sup>3</sup> )		Option 1	Option 2	Option 3
Solid fuels [50][70][100]– 500 kWth	New installations	30	50	150
	Existing installations	100	150	150
Solid fuels 500 kWth–1 MWth	New installations	20	50	150
	Existing installations	30	150	150

**3. Combustion installations with a rated thermal input > 1–50 MWth**

**Table 15: Limit values for dust emissions released from boilers [and process heaters] with a rated thermal input of 1 MWth–50 MWth (O<sub>2</sub> reference content: Wood, other solid biomass and peat: 11%; Coal, lignite and other fossil solid fuels: 6%; Liquid fuels, including liquid biofuels: 3%)**

<del>Particulate matter</del> <u>Dust</u> concentration (mg/Nm <sup>3</sup> )		Option 1	Option 2	Option 3
Solid fuels	New installations	10	20	150

> 1-5 MWth	Existing installations	20	50	150
Solid fuels	New installations	10	20	50
	> 5-50 MW Existing installations	20	30	50
Liquid fuels > 1-5 MWth	New installations	10	20	150