

Convention on Long-Range Transboundary Air Pollution

45<sup>th</sup> Working Group on Strategies and Review – 31 August 2009 to 4 September 2009

Technical Annex prepared by EGTEI

## **Suggested Technical Annex VII to the Gothenburg Protocol**

**Annex VII**

**LIMIT VALUES FOR EMISSIONS OF DUST FROM STATIONARY SOURCES**

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 limit value means the quantity of a solid substance 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 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>a</sup> in all cases. Compliance with limit values shall be verified. 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 emission standards is achieved if the validated [daily/monthly]<sup>b</sup> emission average does not exceed the limit values. In case of discontinuous measurements or other appropriate determination procedures, compliance with the emission 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 of relevant polluting substances and measurements of 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.

---

<sup>a</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.

<sup>b</sup> One option is to define the ELVs as daily averages, another option is to define the ELVs as monthly averages; shorter averaging periods can be considered as being more strict.

## ANNEX VII

5. Special provisions for combustion plants 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 using [only/mainly] 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 combustion plants not operated more than XXX operating hours, starting from DATE and ending no later than DATE]

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 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 dust 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 dust emissions released from refineries using the bubble concept**

Emission source	Suggested ELV for dust [mg/Nm <sup>3</sup> ]						
	%						
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>
	Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Mineral oil refinery	30		50			100	

ANNEX VII

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

**Table 2. Suggested options for limit values for dust emissions released from boilers [and process heaters] <sup>a/</sup>**

Fuel type	Thermal input [MWth]	Suggested 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>
			Lower BAT AEL	Techniques		Upper BAT AEL	Techniques	Legislation
Solid fuels	50-100	New plants: 10 (coal, lignite) 10 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite: ESP or FF  Peat, biomass: ESP or FF	New plants: 20 (coal, lignite) 20 (biomass, peat)	Coal, lignite: 20  Peat, biomass: 20	Same as for option 1	New plants: 50 (coal, lignite) 50 (biomass, peat)  EU-LCPD:(licence after 2002): 50 EU-IED (permit before 2014): 30 EU-IED (permit after 2014): 20 UNECE-HMP: 50
		Existing plants: 15 (coal, lignite) 15 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite: ESP or FF  Peat, biomass: ESP or FF	Existing plants: 30 (coal, lignite) 30 (biomass, peat)	Coal, lignite: 30  Peat, biomass: 30	Same as for option 1	Existing plants: 50 (coal, lignite) 50 (biomass, peat)  EU-LCPD:(licence before 2002; <500MW): 100 EU-LCPD:(licence after 2002): 50 EU-IED (permit before 2014): 30 EU-IED (permit after 2014): 20 UNECE-HMP: 50

<sup>c</sup> Individual combustion plants below 15 MWth shall not be considered to calculate the total rated input.

ANNEX VII

Fuel type	Thermal input [MWth]	Suggested 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>	
			Lower BAT AEL	Techniques		Upper BAT AEL	Techniques	Legislation	
	100-300	New plants: 10 (coal, lignite) 10 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite: ESP or FF in combination FGD (wet, sd or dsi) for PC ESP or FF for CFBC  Peat, biomass: ESP or FF	New plants: 20 (coal, lignite) 20 (biomass, peat)	Coal, lignite: 20  Peat, biomass: 20	Same as for option 1	New plants: 30 (coal, lignite) 30 (biomass, peat)	EU-LCPD (licence after 2002): 30  EU-IED directive (permit before 2014):coal, lignite: 25; peat, biomass: 20  EU-IED (permit after 2014): 20  UNECE-HMP: 50
		Existing plants: 15 (coal, lignite) 10 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite: ESP or FF in combination FGD (wet, sd or dsi) for PC ESP or FF for CFBC  Peat, biomass: ESP or FF	Existing plants: 25 (coal, lignite) 20 (biomass, peat)	Coal, lignite: 25  Peat, biomass: 20	Same as for option 1	Existing plants: 50 (coal, lignite) 50 (biomass, peat)	EU-LCPD:(licence before 2002; <500MW): 100  EU-LCPD:(licence after 2002): 30  EU-IED directive (permit before 2014):coal, lignite: 25; peat, biomass: 20  EU-IED (permit after 2014): 20  UNECE-HMP: 50
	>300	New plants: 10 (coal, lignite) 10 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite (PC): ESP or FF in combination with FGD (wet)  Coal, lignite (CFBC): ESP or FF	New plants: 10 (coal, lignite) 20 (biomass, peat)	Coal, lignite (PC): 10  Coal, lignite (CFBC): 20  Peat, biomass: 5	Same as for option 1	New plants: 30 (coal, lignite) 30 (biomass, peat)	EU-LCPD (licence after 2002.): 30  EU-IED (permit before 2014): 20  EU-IED (permit after 2014): 10; biomass, peat: 20  UNECE-HMP: 50

ANNEX VII

Fuel type	Thermal input [MWth]	Suggested 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>			
			Lower BAT AEL	Techniques		Upper BAT AEL	Techniques	Legislation	
		Existing plants: 10 (coal, lignite) 10 (biomass, peat)	Coal, lignite: 5  Peat, biomass: 5	Coal, lignite (PC): ESP or FF in combination with FGD (wet)  Coal, lignite (CFBC): ESP or FF	Existing plants: 20 (coal, lignite) 20 (biomass, peat)	Coal, lignite: 20  Peat, biomass: 20	Same as for option 1	Existing plants: 50 (coal, lignite) 50 (biomass, peat)	EU-LCPD (licence before 2002, <500 MW): 100; (licence before 2002, >500 MW): 50  EU-LCPD (licence after 2002.): 30  EU-IED (permit before 2014): 20  EU-IED (permit before 2014): 20  EU-IED (permit after 2014): 10; biomass, peat: 20  UNECE-HMP: 50
Liquid fuels	50-100	New plants: 10	5 (10 for ESP)	ESP/FF	New plants: 20	20 (50 for ESP)	Same as for option 1	New plants: 50	EU-LCPD: 50  EU-IED (permit before 2014): 30  EU-IED (permit after 2014): 20  UNECE-HMP: 50
		Existing plants: 15	5 (10 for ESP)	ESP/FF	Existing plants: 30	30 (50 for ESP)	Same as for option 1	Existing plants: 50	EU-LCPD: 50  EU-IED (permit before 2014): 30  EU-IED (permit after 2014): 20  UNECE-HMP: 50

ANNEX VII

Fuel type	Thermal input [MWth]	Suggested 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>
			Lower BAT AEL	Techniques		Upper BAT AEL	Techniques	Legislation
	100-300	New plants: 10	5	ESP/FF/in combination FGD (wet) (depending on the specific plant size)	New plants: 20	20 (30 for ESP)	Same as for option 1	New plants: 30 EU-LCPD (licence after 2002.): 30 EU-IED (permit before 2014): 25 EU-IED (permit after 2014): 20 UNECE-HMP: 50
		Existing plants: 15	5	ESP/FF/in combination FGD (wet) (depending on the specific plant size)	Existing plants: 25	25 (50 for ESP)	Same as for option 1	Existing plants: 50 EU-LCPD (licence before 2002.): 50 EU-LCPD (licence after 2002.): 30 EU-IED (permit before 2014): 25 EU-IED (permit after 2014): 20 UNECE-HMP: 50
	>300	New plants: 5	5	ESP/FF/in combination with FGD (wet)	New plants: 10	10	Same as for option 1	New plants: 30 EU-LCPD (licence after 2002.): 30 EU-IED (permit before 2014): 20 EU-IED (permit after 2014): 10 UNECE-HMP: 50

ANNEX VII

Fuel type	Thermal input [MWth]	Suggested 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>	
			Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
		Existing plants: 10	5	ESP/FF/in combination with FGD (wet)	Existing plants: 20	20	Same as for option 1	Existing plants: 50	EU-LCPD (licence before 2002): 50 EU-LCPD (licence after 2002,): 30 EU-IED (permit before 2014): 20 EU-IED (permit after 2014): 10 UNECE-HMP: 50
Natural gas	>50	5				5	EU-LCPD: 5 EU-IED: 5		
Combustion plants in refineries	>50	10				20	50		
<p>BREF (coal, lignite):</p> <ul style="list-style-type: none"> <li>the reduction rate associated with the use of an ESP is considered to be 99.5 % or higher</li> <li>the reduction rate associated with the use of a fabric filter is considered to be 99.95 % or higher</li> <li>a wet scrubber used for desulphurisation also reduces dust.</li> </ul> <p>BREF (biomass, peat):</p> <ul style="list-style-type: none"> <li>The reduction rate associated with the use of a fabric filter is considered to be 99.95 % or higher and is, therefore, considered as the first BAT choice for dedusting biomass- and peatfired plants.</li> <li>The reduction rate associated with the use of an ESP is considered to be 99.5 % or higher.</li> </ul>									



## ANNEX VII

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

ANNEX VII

8. Mineral oil and gas refineries

**Table 3. Suggested options for limit values for dust emissions released from mineral oil and gas refineries**

Emission source	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
FCC regenerators	20	10	- tertiary and multistage cyclones -applying an ESP or scrubber to the FCC regenerator gas. -containing catalyst losses to atmosphere during loading/ unloading -hydro-treatment of the feedstock -selecting attrition- resistant catalyst	40	40/50	Same as for option 1	200	EU-IED (half-hourly): 100%: 30, 97%: 10

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

9. Cement production:

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

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
	Option	Lower BAT AEL	Techniques	Option	Lower BAT AEL	Techniques	Option	Legislation
Cement installations	15	10	Fabric filters or ESP	20	20	Fabric filters or ESP	50	UNECE-HMP

## ANNEX VII

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 oxygen reference content is 10 %.

10. Lime production:

**Table 5. Suggested options for limit values for dust emissions released from lime production**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
	Option	Lower BAT AEL	Techniques	Option	Lower BAT AEL	Techniques	Option	Legislation
Cement installations	15	10	Fabric filters or ESP	20	20	Fabric filters or ESP	30	Based on a consensus of the EGTEI group

ANNEX VII

11. Production and processing of metals:

Iron and steel production:

**Table 6. Suggested options for limit values for dust emissions released from primary iron and steel production**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/ b/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Sinter plant (>150 t/day)	15 <sup>a/</sup>	< 50 10 FF	Advanced (ESP) (moving electrode ESP, ESP pulse system, high voltage operation of ESP ...) or - electrostatic precipitation plus fabric filter or - pre-dedusting (e.g. ESP or cyclones) plus high pressure wet scrubbing system.	50 <sup>a/</sup>	<50 20 FF	Same as for option 1	50	UNECE-HMP: 50
Pelletization plant (>150 t/day)	5 <sup>a/</sup>	95% removal corresponding to 10 mg/Nm <sup>3</sup>	-Semi-dry desulphurisation and subsequent de-dusting (e.g. gas suspension absorber (GSA)) or any other device with the same efficiency. -Scrubbing	10 <sup>a/</sup>	95% removal corresponding to 10 mg/Nm <sup>3</sup>	Same as for option 1.	25	UNECE-HMP: 25
Blast furnace: Hot stoves (>2.5 t/hour)	5 <sup>a/</sup>	10	- a scrubber or - a wet electrostatic precipitator or - any other technique achieving the same removal efficiency	10 <sup>a/</sup>	10	Same as for option 1	50	UNECE-HMP: 50
Basic oxygen steelmaking and casting (>2.5 t/hour)	10 <sup>a/</sup>	5 20 ESP	hot metal pre-treatment: FF/ESP  BOF gas recovery and primary de-dusting, applying: - Suppressed combustion and - Dry electrostatic precipitation (in new and existing situations) or - Scrubbing (in existing situations) Secondary de-dusting: FF/ESP	30 <sup>a/</sup>	15 30 ESP	Same as for option 1	50	Based on a consensus of the EGTEI group

ANNEX VII

Electric steelmaking and casting (>2.5 t/hour)	10 (existing) 5 (new)	15 existing 5 new	FF	15 (existing) 5 (new)	15 existing 5 new	Same as for option 1	20	UNECE-HMP: 50
--	--------------------------	----------------------	----	--------------------------	----------------------	----------------------	----	---------------

a/ As an exemption to paragraph 3, these ELVs should be considered as averaged over a substantial period of time

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

Iron foundries:

**Table 7. Suggested options for limit values for dust emissions released from iron foundries**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Iron foundries (>20 t/day): - all furnaces (cupola, induction, rotary) - all mouldings (lost, permanent)	10	5	bag filter or wet scrubber	20	20	Same as for option 1	50	[UNECE-HMP: EAF:20, BF:50]
Hot and cold rolling	10	Scarfing: 5 Grinding: < 30 Mill stands: 2 Coil handling: 50	FF ESP where FF cannot be operated because of wet fume	20	Scarfing: 115 Grinding: 100 Mill stands: 50 Coil handling: 50	Same as for option 1		

ANNEX VII

Production and processing of non ferrous metals:

**Table 8. Suggested options for limit values for dust emissions released from non ferrous metals production and processing**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ] [daily]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		BAT AEL	Techniques		Legislation
non ferrous metal processing <sup>a</sup> - fabric filters, ceramic filters: - electrostatic precipitators: - scrubbers:	[3] 7 10  [3] Based on a consensus of the EG	1 with Fabric filters	FF ESP Scrubbers	[5] 12 20	5 with Fabric filters	FF ESP Scrubbers	20 20 20	UNECE-HMP: 20 UNECE-HMP: 20 UNECE-HMP: 20
EGTEI 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 dust 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:

ANNEX VII

**Table 9. Suggested options for limit values for dust emissions released from glass production**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
New installations	10	5	ESP or FF, where appropriate, in conjunction with a dry or semi-dry acid gas scrubbing system	30	30	Same as for option 1	50	Based on an EGTEI group consensus
Existing installations	15	5	ESP or FF, where appropriate, in conjunction with a dry or semi-dry acid gas scrubbing system	30	30	Same as for option 1	50	Based on an EGTEI group consensus

For combustion gases: dry, 8 % oxygen by volume (continuous melters), 13 % oxygen by volume (discontinuous melters).

ANNEX VII

13. Pulp production:

**Table 10. Suggested options for limit values for dust emissions released from pulp production**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Auxiliary boiler	25	20	ESP with appropriate efficiency	40	40	ESP with appropriate efficiency	40	EPS, or scrubbers
Recovery boiler and lime kiln	40	30	ESP + SO <sub>2</sub> scrubbers with appropriate efficiency	50	50	ESP + SO <sub>2</sub> scrubbers with appropriate efficiency	80	EPS, or scrubbers



ANNEX VII

14. Waste incineration:

**Table 11. Suggested options for limit values for dust emissions released from waste incineration**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ] (n.b.: 24h average)							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Municipal waste incineration plants (> 3 tonnes/hour)	3	1	“FF give the lower levels”	5	5	Same techniques as in option 1 with appropriate efficiency	10	EU-WID / EU-IED: 10 UNECE-HMP: 25
Hazardous and medical waste incineration (> 1 tonne/hour)	3	1	“FF give the lower levels”	5	5	Same techniques as in option 1 with appropriate efficiency	10	EU-WID / EU-IED: 10 UNECE-HMP: 10

Oxygen reference: dry basis, 11%.

ANNEX VII

15. Wood processing:

**Table 12: Suggested options for limit values for dust emissions from for wood processing industry**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Lower BAT AEL	Techniques		Upper BAT AEL	Techniques		Legislation
Dryer	25 EGTEI suggestion	No BREF for this activity	FF or ESP	50 EGTEI suggestion	No BREF for this activity	FF or ESP	100	EGTEI suggestion Cyclone or any other filtration system with an efficiency permitting to achieve this emission level
Panel production <sup>1</sup>	1 EGTEI suggestion	No BREF for this activity	FF or ESP	5 EGTEI suggestion	No BREF for this activity	FF or ESP	10	EGTEI suggestion Cyclone or any other filtration system with an efficiency permitting to achieve this emission level
Other wood processing industry <sup>1</sup>	25 EGTEI suggestion	No BREF for this activity	FF or ESP	25 EGTEI suggestion	No BREF for this activity	FF or ESP	100	EGTEI suggestion Cyclone or any other filtration system with an efficiency permitting to achieve this emission level

<sup>1</sup>emissions from dryers are not included

<sup>1</sup>emissions from dryers are not included

ANNEX VII

16. Titanium dioxide production:

**Table 13. Suggested options for limit values for dust emissions released from titanium dioxide production**

	Suggested ELV for dust [mg/Nm <sup>3</sup> ]							
	Option 1 <sup>1/</sup>			Option 2 <sup>1/</sup>			Option 3 <sup>1/</sup>	
		Upper BAT AEL	Techniques		Lower BAT AEL	Techniques		Legislation
Sulphate process, emission main sources [mg/Nm <sup>3</sup> ]	<b>12</b>	5	Bag filters, ESP, scrubbing system, fabric filters with appropriate efficiency	<b>20</b>	20	Bag filters, ESP, scrubbing system, fabric filters with appropriate efficiency	<b>50</b>	92/112/EEC directive
Chloride process, emission main sources [kg/t of TiO <sub>2</sub> ]	<b>0.15</b>	0.1	Bag filters with appropriate efficiency	<b>0.2</b>	0.2	Bag filters with appropriate efficiency	<b>50 [mg/Nm<sup>3</sup>]</b>	92/112/EEC directive

B. Canada<sup>2/</sup>

C. United States of America<sup>2/</sup>

Note

<sup>1/</sup>The definitions of option 1, option 2 and option 3 are as follows. These options were designed to leave maximum flexibility for discussion at the WGSR.

Options for ELVs are as follows:

## ANNEX VII

- Option 1: ELV1 is a demanding but technically feasible option with the objective of achieving a high level of reduction. The ELV1 is based on a value between the lower and upper BAT AEL, (where it is available),
- Option 2: ELV2, while technically demanding, pays greater attention to the costs of the measures for achieving reduction. The ELV2 is a value based on the upper BAT AEL (where it is available),
- Option 3: ELV 3 represents current [good] practices based on the legislation of a number of Parties to the Convention.

2/ Up to now, no information has been provided by North America, then part B and C of the annex have not been written yet.