Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) (Text with EEA relevance)

## ANNEX I

### Categories of activities referred to in Article 10

The threshold values given below generally refer to production capacities or outputs. Where several activities falling under the same activity description containing a threshold are operated in the same installation, the capacities of such activities are added together. For waste management activities, this calculation shall apply at the level of activities 5.1, 5.3(a) and 5.3(b).

The Commission shall establish guidance on:

- (a) the relationship between waste management activities described in this Annex and those described in Annexes I and II to Directive 2008/98/EC; and
- (b) the interpretation of the term 'industrial scale' regarding the description of chemical industry activities described in this Annex.
- 1. Energy industries
- 1.1. Combustion of fuels in installations with a total rated thermal input of 50 MW or more
- 1.2. Refining of mineral oil and gas
- 1.3. Production of coke
- 1.4. Gasification or liquefaction of:
- (a) coal;
- (b) other fuels in installations with a total rated thermal input of 20 MW or more.
- 2. Production and processing of metals
- 2.1. Metal ore (including sulphide ore) roasting or sintering
- 2.2. Production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2,5 tonnes per hour
- 2.3. Processing of ferrous metals:
- (a) operation of hot-rolling mills with a capacity exceeding 20 tonnes of crude steel per hour;
- (b) operation of smitheries with hammers the energy of which exceeds 50 kilojoule per hammer, where the calorific power used exceeds 20 MW;
- (c) application of protective fused metal coats with an input exceeding 2 tonnes of crude steel per hour.
- 2.4. Operation of ferrous metal foundries with a production capacity exceeding 20 tonnes per day
- 2.5. Processing of non-ferrous metals:
- (a) production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes;
- (b) melting, including the alloyage, of non-ferrous metals, including recovered products and operation of non-ferrous metal foundries, with a melting capacity exceeding 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals.

- 2.6. Surface treatment of metals or plastic materials using an electrolytic or chemical process where the volume of the treatment vats exceeds  $30 \text{ m}^3$
- 3. Mineral industry
- 3.1. Production of cement, lime and magnesium oxide:
- (a) production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or in other kilns with a production capacity exceeding 50 tonnes per day;
- (b) production of lime in kilns with a production capacity exceeding 50 tonnes per day;
- (c) production of magnesium oxide in kilns with a production capacity exceeding 50 tonnes per day.
- 3.2. Production of asbestos or the manufacture of asbestos-based products
- 3.3. Manufacture of glass including glass fibre with a melting capacity exceeding 20 tonnes per day
- 3.4. Melting mineral substances including the production of mineral fibres with a melting capacity exceeding 20 tonnes per day
- 3.5. Manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain with a production capacity exceeding 75 tonnes per day and/or with a kiln capacity exceeding 4 m<sup>3</sup> and with a setting density per kiln exceeding 300 kg/m<sup>3</sup>
- 4. Chemical industry

For the purpose of this section, production within the meaning of the categories of activities contained in this section means the production on an industrial scale by chemical or biological processing of substances or groups of substances listed in points 4.1 to 4.6

- 4.1. Production of organic chemicals, such as:
- (a) simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic);
- (b) oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters and mixtures of esters, acetates, ethers, peroxides and epoxy resins;
- (c) sulphurous hydrocarbons;
- (d) nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitriles, cyanates, isocyanates;
- (e) phosphorus-containing hydrocarbons;
- (f) halogenic hydrocarbons;
- (g) organometallic compounds;
- (h) plastic materials (polymers, synthetic fibres and cellulose-based fibres);
- (i) synthetic rubbers;
- (j) dyes and pigments;

- (k) surface-active agents and surfactants.
- 4.2. Production of inorganic chemicals, such as:
- (a) gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulphur compounds, nitrogen oxides, hydrogen, sulphur dioxide, carbonyl chloride;

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- (b) acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulphuric acid, oleum, sulphurous acids;
- (c) bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide;
- (d) salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate;
- (e) non-metals, metal oxides or other inorganic compounds such as calcium carbide, silicon, silicon carbide.
- 4.3. Production of phosphorous-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers)
- 4.4. Production of plant protection products or of biocides
- 4.5. Production of pharmaceutical products including intermediates
- 4.6. Production of explosives
- 5. Waste management
- 5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day involving one or more of the following activities:
- (a) biological treatment;
- (b) physico-chemical treatment;
- (c) blending or mixing prior to submission to any of the other activities listed in points 5.1 and 5.2;
- (d) repackaging prior to submission to any of the other activities listed in points 5.1 and 5.2;
- (e) solvent reclamation/regeneration;
- (f) recycling/reclamation of inorganic materials other than metals or metal compounds;
- (g) regeneration of acids or bases;
- (h) recovery of components used for pollution abatement;
- (i) recovery of components from catalysts;
- (j) oil re-refining or other reuses of oil;
- (k) surface impoundment.
- 5.2. Disposal or recovery of waste in waste incineration plants or in waste co-incineration plants:
- (a) for non-hazardous waste with a capacity exceeding 3 tonnes per hour;

(b) for hazardous waste with a capacity exceeding 10 tonnes per day.

5.3.

- (a) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment<sup>(1)</sup>:
  - (i) biological treatment;
  - (ii) physico-chemical treatment;
  - (iii) pre-treatment of waste for incineration or co-incineration;
  - (iv) treatment of slags and ashes;
  - (v) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.
- (b) Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities, and excluding activities covered by Directive 91/271/EEC:
  - (i) biological treatment;
  - (ii) pre-treatment of waste for incineration or co-incineration;
  - (iii) treatment of slags and ashes;
  - (iv) treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.

When the only waste treatment activity carried out is anaerobic digestion, the capacity threshold for this activity shall be 100 tonnes per day.

- 5.4. Landfills, as defined in Article 2(g) of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste<sup>(2)</sup>, receiving more than 10 tonnes of waste per day or with a total capacity exceeding 25 000 tonnes, excluding landfills of inert waste
- 5.5. Temporary storage of hazardous waste not covered under point 5.4 pending any of the activities listed in points 5.1, 5.2, 5.4 and 5.6 with a total capacity exceeding 50 tonnes, excluding temporary storage, pending collection, on the site where the waste is generated
- 5.6. Underground storage of hazardous waste with a total capacity exceeding 50 tonnes
- 6. Other activities
- 6.1. Production in industrial installations of:
- (a) pulp from timber or other fibrous materials;
- (b) paper or card board with a production capacity exceeding 20 tonnes per day;
- (c) one or more of the following wood-based panels: oriented strand board, particleboard or fibreboard with a production capacity exceeding  $600 \text{ m}^3$  per day.
- 6.2. Pre-treatment (operations such as washing, bleaching, mercerisation) or dyeing of textile fibres or textiles where the treatment capacity exceeds 10 tonnes per day

6.3. Tanning of hides and skins where the treatment capacity exceeds 12 tonnes of finished products per day

6.4.

- (a) Operating slaughterhouses with a carcass production capacity greater than 50 tonnes per day
- (b) Treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food or feed from:
  - (i) only animal raw materials (other than exclusively milk) with a finished product production capacity greater than 75 tonnes per day;
  - (ii) only vegetable raw materials with a finished product production capacity greater than 300 tonnes per day or 600 tonnes per day where the installation operates for a period of no more than 90 consecutive days in any year;
  - (iii) animal and vegetable raw materials, both in combined and separate products, with a finished product production capacity in tonnes per day greater than:
    - 75 if A is equal to 10 or more; or,
    - $[300-(22,5 \times A)]$  in any other case,

where 'A' is the portion of animal material (in percent of weight) of the finished product production capacity.

Packaging shall not be included in the final weight of the product.

This subsection shall not apply where the raw material is milk only.

- (c) Treatment and processing of milk only, the quantity of milk received being greater than 200 tonnes per day (average value on an annual basis).
- 6.5. Disposal or recycling of animal carcases or animal waste with a treatment capacity exceeding 10 tonnes per day
- 6.6. Intensive rearing of poultry or pigs:
- (a) with more than 40 000 places for poultry;
- (b) with more than 2 000 places for production pigs (over 30 kg), or
- (c) with more than 750 places for sows.
- 6.7. Surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating, with an organic solvent consumption capacity of more than 150 kg per hour or more than 200 tonnes per year
- 6.8. Production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitisation
- 6.9. Capture of CO<sub>2</sub> streams from installations covered by this Directive for the purposes of geological storage pursuant to Directive 2009/31/EC

- 6.10. Preservation of wood and wood products with chemicals with a production capacity exceeding 75  $m^3$  per day other than exclusively treating against sapstain
- 6.11. Independently operated treatment of waste water not covered by Directive 91/271/ EEC and discharged by an installation covered by Chapter II

## ANNEX II

## List of polluting substances

#### AIR

- 1. Sulphur dioxide and other sulphur compounds
- 2. Oxides of nitrogen and other nitrogen compounds
- 3. Carbon monoxide
- 4. Volatile organic compounds
- 5. Metals and their compounds
- 6. Dust including fine particulate matter
- 7. Asbestos (suspended particulates, fibres)
- 8. Chlorine and its compounds
- 9. Fluorine and its compounds
- 10. Arsenic and its compounds
- 11. Cyanides
- 12. Substances and mixtures which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction via the air
- 13. Polychlorinated dibenzodioxins and polychlorinated dibenzofurans

WATER

- 1. Organohalogen compounds and substances which may form such compounds in the aquatic environment
- 2. Organophosphorus compounds
- 3. Organotin compounds
- 4. Substances and mixtures which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction in or via the aquatic environment
- 5. Persistent hydrocarbons and persistent and bioaccumulable organic toxic substances
- 6. Cyanides
- 7. Metals and their compounds
- 8. Arsenic and its compounds

- 10. Materials in suspension
- 11. Substances which contribute to eutrophication (in particular, nitrates and phosphates)

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- 12. Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.)
- 13. Substances listed in Annex X to Directive 2000/60/EC

#### ANNEX III

#### Criteria for determining best available techniques

- 1. the use of low-waste technology;
- 2. the use of less hazardous substances;
- 3. the furthering of recovery and recycling of substances generated and used in the process and of waste, where appropriate;
- 4. comparable processes, facilities or methods of operation which have been tried with success on an industrial scale;
- 5. technological advances and changes in scientific knowledge and understanding;
- 6. the nature, effects and volume of the emissions concerned;
- 7. the commissioning dates for new or existing installations;
- 8. the length of time needed to introduce the best available technique;
- 9. the consumption and nature of raw materials (including water) used in the process and energy efficiency;
- 10. the need to prevent or reduce to a minimum the overall impact of the emissions on the environment and the risks to it;
- 11. the need to prevent accidents and to minimise the consequences for the environment;
- 12. information published by public international organisations.

#### ANNEX IV

#### Public participation in decision-making

1. The public shall be informed (by public notices or other appropriate means such as electronic media where available) of the following matters early in the procedure for the taking of a decision or, at the latest, as soon as the information can reasonably be provided:

- (a) the application for a permit or, as the case may be, the proposal for the updating of a permit or of permit conditions in accordance with Article 21, including the description of the elements listed in Article 12(1);
- (b) where applicable, the fact that a decision is subject to a national or transboundary environmental impact assessment or to consultations between Member States in accordance with Article 26;
- (c) details of the competent authorities responsible for taking the decision, those from which relevant information can be obtained, those to which comments or questions can be submitted, and details of the time schedule for transmitting comments or questions;
- (d) the nature of possible decisions or, where there is one, the draft decision;
- (e) where applicable, the details relating to a proposal for the updating of a permit or of permit conditions;
- (f) an indication of the times and places where, or means by which, the relevant information will be made available;
- (g) details of the arrangements for public participation and consultation made pursuant to point 5.
- 2. Member States shall ensure that, within appropriate time-frames, the following is made available to the public concerned:
- (a) in accordance with national law, the main reports and advice issued to the competent authority or authorities at the time when the public concerned were informed in accordance with point 1;
- (b) in accordance with Directive 2003/4/EC, information other than that referred to in point 1 which is relevant for the decision in accordance with Article 5 of this Directive and which only becomes available after the time the public concerned was informed in accordance with point 1.
- 3. The public concerned shall be entitled to express comments and opinions to the competent authority before a decision is taken.
- 4. The results of the consultations held pursuant to this Annex must be taken into due account in the taking of a decision.
- 5. The detailed arrangements for informing the public (for example by bill posting within a certain radius or publication in local newspapers) and consulting the public concerned (for example by written submissions or by way of a public inquiry) shall be determined by the Member States. Reasonable time-frames for the different phases shall be provided, allowing sufficient time to inform the public and for the public concerned to prepare and participate effectively in environmental decision-making subject to this Annex.

## ANNEX V

## Technical provisions relating to combustion plants

## PART 1

## **Emission limit values for combustion plants referred to in Article 30(2)**

- 1. All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised  $O_2$  content of 6 % for solid fuels, 3 % for combustion plants, other than gas turbines and gas engines using liquid and gaseous fuels and 15 % for gas turbines and gas engines.
- 2. Emission limit values  $(mg/Nm^3)$  for SO<sub>2</sub> for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	Coal and lignite and other solid fuels	Biomass	Peat	Liquid fuels
50-100	400	200	300	350
100-300	250	200	300	250
> 300	200	200	200	200

Combustion plants, using solid fuels which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for SO<sub>2</sub> of 800 mg/Nm<sup>3</sup>.

Combustion plants using liquid fuels, which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for  $SO_2$  of 850 mg/Nm<sup>3</sup> in case of plants with a total rated thermal input not exceeding 300 MW and of 400 mg/Nm<sup>3</sup> in case of plants with a total rated thermal input greater than 300 MW.

A part of a combustion plant discharging its waste gases through one or more separate flues within a common stack, and which does not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, may be subject to the emission limit values set out in the preceding two paragraphs in relation to the total rated thermal input of the entire combustion plant. In such cases the emissions through each of those flues shall be monitored separately.

3. Emission limit values (mg/Nm<sup>3</sup>) for SO<sub>2</sub> for combustion plants using gaseous fuels with the exception of gas turbines and gas engines

In general	35
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Liquefied gas	5
Low calorific gases from coke oven	400
Low calorific gases from blast furnace	200

Combustion plants, firing low calorific gases from gasification of refinery residues, which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, shall be subject to an emission limit value for SO<sub>2</sub> of 800 mg/Nm<sup>3</sup>.

4. Emission limit values  $(mg/Nm^3)$  for NO<sub>x</sub> for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	Coal and lignite and other solid fuels	Biomass and peat	Liquid fuels
50-100	300 450 in case of pulverised lignite combustion	300	450
100-300	200	250	200ª
> 300	200	200	150ª

a The emission limit value is 450 mg/Nm<sup>3</sup> for the firing of distillation and conversion residues from the refining of crudeoil for own consumption in combustion plants with a total rated thermal input not exceeding 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003.

Combustion plants in chemical installations using liquid production residues as non-commercial fuel for own consumption with a total rated thermal input not exceeding 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, shall be subject to an emission limit value for NO<sub>x</sub> of 450 mg/Nm<sup>3</sup>.

Combustion plants using solid or liquid fuels with a total rated thermal input not exceeding 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for NO<sub>x</sub> of 450 mg/Nm<sup>3</sup>.

Combustion plants using solid fuels with a total rated thermal input greater than 500 MW, which were granted a permit before 1 July 1987 and which do not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for NO<sub>x</sub> of 450 mg/Nm<sup>3</sup>.

Combustion plants using liquid fuels, with a total rated thermal input greater than 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1 500 operating hours

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per year as a rolling average over a period of 5 years, shall be subject to an emission limit value for  $NO_x$  of 400 mg/Nm<sup>3</sup>.

A part of a combustion plant discharging its waste gases through one or more separate flues within a common stack, and which does not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, may be subject to the emission limit values set out in the preceding three paragraphs in relation to the total rated thermal input of the entire combustion plant. In such cases the emissions through each of those flues shall be monitored separately.

5. Gas turbines (including combined cycle gas turbines (CCGT)) using light and middle distillates as liquid fuels shall be subject to an emission limit value for  $NO_x$  of 90 mg/  $Nm^3$  and for CO of 100 mg/Nm<sup>3</sup>.

Gas turbines for emergency use that operate less than 500 operating hours per year are not covered by the emission limit values set out in this point. The operator of such plants shall record the used operating hours.

	NO <sub>x</sub>	СО	
Combustion plants firing natural gas with the exception of gas turbines and gas engines	100	100	
Combustion plants firing blast furnace gas, coke oven gas or low calorific gases from gasification of refinery residues, with the exception of gas turbines and gas engines	200 <sup>d</sup>		
Combustion plants firing other gases, with the exception of gas turbines and gas engines	200 <sup>d</sup>		
Gas turbines (including CCGT), using natural gas <sup>a</sup> as fuel	50 <sup>bc</sup>	100	
Gas turbines (including CCGT), using other gases as fuel	120		
Gas engines	100	100	
a Natural gas is naturally occurring methane with not more than 20 % (by volume) of inerts and other constituents.			

6. Emission limit values  $(mg/Nm^3)$  for NO<sub>x</sub> and CO for gas fired combustion plants

**b** 75 mg/Nm<sup>3</sup> in the following cases, where the efficiency of the gas turbine is determined at ISO base load conditions:

(i) gas turbines, used in combined heat and power systems having an overall efficiency greater than 75 %;

(ii) gas turbines used in combined cycle plants having an annual average overall electrical efficiency greater than 55 %;
 (iii) gas turbines for mechanical drives.

- c For single cycle gas turbines not falling into any of the categories mentioned under note (2), but having an efficiency greater than 35 % determined at ISO base load conditions the emission limit value for NO<sub>x</sub> shall be  $50x\eta/35$  where  $\eta$  is the gas turbine efficiency at ISO base load conditions expressed as a percentage.
- **d** 300 mg/Nm<sup>3</sup> for such combustion plants with a total rated thermal input not exceeding 500 MW which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003.

For gas turbines (including CCGT), the  $NO_x$  and CO emission limit values set out in the table contained in this point apply only above 70 % load.

For gas turbines (including CCGT) which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003, and which do not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, the emission limit value for  $NO_x$  is 150 mg/Nm<sup>3</sup> when firing natural gas and 200 mg/Nm<sup>3</sup> when firing other gases or liquid fuels.

A part of a combustion plant discharging its waste gases through one or more separate flues within a common stack, and which does not operate more than 1 500 operating hours per year as a rolling average over a period of 5 years, may be subject to the emission limit values set out in the preceding paragraph in relation to the total rated thermal input of the entire combustion plant. In such cases the emissions through each of those flues shall be monitored separately.

Gas turbines and gas engines for emergency use that operate less than 500 operating hours per year are not covered by the emission limit values set out in this point. The operator of such plants shall record the used operating hours.

7. Emission limit values (mg/Nm<sup>3</sup>) for dust for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	Coal and lignite and other solid fuels	Biomass and peat	Liquid fuels <sup>a</sup>
50-100	30	30	30
100-300	25	20	25
> 300	20	20	20

a The emission limit value is 50 mg/Nm<sup>3</sup> for the firing of distillation and conversion residues from the refining of crude oil for own consumption in combustion plants which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003.

# 8. Emission limit values (mg/Nm<sup>3</sup>) for dust for combustion plants using gaseous fuels with the exception of gas turbines and gas engines

In general	5
Blast furnace gas	10
Gases produced by the steel industry which can be used elsewhere	30

## PART 2

## Emission limit values for combustion plants referred to in Article 30(3)

1. All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised  $O_2$  content of 6 % for solid fuels, 3 % for combustion plants other than gas turbines and gas engines using liquid and gaseous fuels and 15 % for gas turbines and gas engines.

In case of combined cycle gas turbines with supplementary firing, the standardised  $O_2$  content may be defined by the competent authority, taking into account the specific characteristics of the installation concerned.

2. Emission limit values (mg/Nm<sup>3</sup>) for SO<sub>2</sub> for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	Coal and lignite and other solid fuels	Biomass	Peat	Liquid fuels
50-100	400	200	300	350
100-300	200	200	300 250 in case of fluidised bed combustion	200
> 300	150 200 in case of circulating or pressurised fluidised bed combustion	150	150 200 in case of fluidised bed combustion	150

3. Emission limit values (mg/Nm<sup>3</sup>) for SO<sub>2</sub> for combustion plants using gaseous fuels with the exception of gas turbines and gas engines

In general	35
Liquefied gas	5
Low calorific gases from coke oven	400
Low calorific gases from blast furnace	200

4. Emission limit values  $(mg/Nm^3)$  for NO<sub>x</sub> for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	Coal and lignite and other solid fuels	Biomass and peat	Liquid fuels	
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50-100	300 400 in case of pulverised lignite combustion	250	300
100-300	200	200	150
> 300	150 200 in case of pulverised lignite combustion	150	100

5. Gas turbines (including CCGT) using light and middle distillates as liquid fuels shall be subject to an emission limit value for NO<sub>x</sub> of 50 mg/Nm<sup>3</sup> and for CO of 100 mg/Nm<sup>3</sup>

Gas turbines for emergency use that operate less than 500 operating hours per year are not covered by the emission limit values set out in this point. The operator of such plants shall record the used operating hours.

6. Emission limit values  $(mg/Nm^3)$  for NO<sub>x</sub> and CO for gas fired combustion plants

	NO <sub>x</sub>	СО
Combustion plants other than gas turbines and gas engines	100	100
Gas turbines (including CCGT)	50 <sup>a</sup>	100
Gas engines	75	100

**a** For single cycle gas turbines having an efficiency greater than 35 % – determined at ISO base load conditions – the emission limit value for NO<sub>x</sub> shall be  $50x\eta/35$  where  $\eta$  is the gas turbine efficiency at ISO base load conditions expressed as a percentage.

For gas turbines (including CCGT), the  $NO_x$  and CO emission limit values set out in this point apply only above 70 % load.

Gas turbines and gas engines for emergency use that operate less than 500 operating hours per year are not covered by the emission limit values set out in this point. The operator of such plants shall record the used operating hours.

7. Emission limit values (mg/Nm<sup>3</sup>) for dust for combustion plants using solid or liquid fuels with the exception of gas turbines and gas engines

Total rated thermal input (MW)	
50-300	20
> 300	10 20 for biomass and peat

8. Emission limit values (mg/Nm<sup>3</sup>) for dust for combustion plants using gaseous fuels with the exception of gas turbines and gas engines

In general	5
Blast furnace gas	10
Gases produced by the steel industry which can be used elsewhere	30

## PART 3

#### **Emission monitoring**

1. The concentrations of  $SO_2$ ,  $NO_x$  and dust in waste gases from each combustion plant with a total rated thermal input of 100 MW or more shall be measured continuously.

The concentration of CO in waste gases from each combustion plant firing gaseous fuels with a total rated thermal input of 100 MW or more shall be measured continuously.

- 2. The competent authority may decide not to require the continuous measurements referred to in point 1 in the following cases:
- (a) for combustion plants with a life span of less than 10 000 operational hours;
- (b) for  $SO_2$  and dust from combustion plants firing natural gas;
- (c) for SO<sub>2</sub> from combustion plants firing oil with known sulphur content in cases where there is no waste gas desulphurisation equipment;
- (d) for SO<sub>2</sub> from combustion plants firing biomass if the operator can prove that the SO<sub>2</sub> emissions can under no circumstances be higher than the prescribed emission limit values.
- 3. Where continuous measurements are not required, measurements of  $SO_2$ ,  $NO_x$ , dust and, for gas fired plants, also of CO shall be required at least once every 6 months.
- 4. For combustion plants firing coal or lignite, the emissions of total mercury shall be measured at least once per year.
- 5. As an alternative to the measurements of  $SO_2$  and  $NO_x$  referred to in point 3, other procedures, verified and approved by the competent authority, may be used to determine the  $SO_2$  and  $NO_x$  emissions. Such procedures shall use relevant CEN standards or, if CEN standards are not available, ISO, national or other international standards which ensure the provision of data of an equivalent scientific quality.
- 6. The competent authority shall be informed of significant changes in the type of fuel used or in the mode of operation of the plant. The competent authority shall decide whether the monitoring requirements laid down in points 1 to 4 are still adequate or require adaptation.
- 7. The continuous measurements carried out in accordance with point 1 shall include the measurement of the oxygen content, temperature, pressure and water vapour content of the waste gases. The continuous measurement of the water vapour content of the waste gases shall not be necessary, provided that the sampled waste gas is dried before the emissions are analysed.
- 8. 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, national or other international standards which ensure the provision of data of an equivalent scientific quality shall apply.

The automated measuring systems shall be subject to control by means of parallel measurements with the reference methods at least once per year.

The operator shall inform the competent authority about the results of the checking of the automated measuring systems.

9. At the emission limit value level, the values of the 95 % confidence intervals of a single measured result shall not exceed the following percentages of the emission limit values:

Carbon monoxide	10 %
Sulphur dioxide	20 %
Nitrogen oxides	20 %
Dust	30 %

10. The validated hourly and daily average values shall be determined from the measured valid hourly average values after having subtracted the value of the confidence interval specified in point 9.

Any day in which more than three hourly average values are invalid due to malfunction or maintenance of the automated measuring system shall be invalidated. If more than 10 days over a year are invalidated for such situations the competent authority shall require the operator to take adequate measures to improve the reliability of the automated measuring system.

11. In the case of plants which must comply with the rates of desulphurisation referred to in Article 31, the sulphur content of the fuel which is fired in the combustion plant shall also be regularly monitored. The competent authorities shall be informed of substantial changes in the type of fuel used.

#### PART 4

#### Assessment of compliance with emission limit values

- 1. In the case of continuous measurements, the emission limit values set out in Parts 1 and 2 shall be regarded as having been complied with if the evaluation of the measurement results indicates, for operating hours within a calendar year, that all of the following conditions have been met:
- (a) no validated monthly average value exceeds the relevant emission limit values set out in Parts 1 and 2;
- (b) no validated daily average value exceeds 110 % of the relevant emission limit values set out in Parts 1 and 2;
- (c) in cases of combustion plants composed only of boilers using coal with a total rated thermal input below 50 MW, no validated daily average value exceeds 150 % of the relevant emission limit values set out in Parts 1 and 2,

(d) 95 % of all the validated hourly average values over the year do not exceed 200 % of the relevant emission limit values set out in Parts 1 and 2.

The validated average values are determined as set out in point 10 of Part 3.

For the purpose of the calculation of the average emission values, the values measured during the periods referred to in Article 30(5) and (6) and Article 37 as well as during the start-up and shut-down periods shall be disregarded.

2. Where continuous measurements are not required, the emission limit values set out in Parts 1 and 2 shall be regarded as having been complied with if the results of each of the series of measurements or of the other procedures defined and determined according to the rules laid down by the competent authorities do not exceed the emission limit values.

## PART 5

## Minimum rate of desulphurisation

1. Minimum rate of desulphurisation for combustion plants referred to in Article 30(2)

Total rated thermal input (MW)	Minimum rate of desulphun Plants which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003	isation Other plants
50-100	80 %	92 %
100-300	90 %	92 %
> 300	96 % <sup>a</sup>	96 %

2. Minimum rate of desulphurisation for combustion plants referred to in Article 30(3)

Total rated thermal input (MW)	Minimum rate of desulphurisation
50-100	93 %
100-300	93 %
> 300	97 %

#### PART 6

#### Compliance with rate of desulphurisation

The minimum rates of desulphurisation set out in Part 5 of this Annex shall apply as a monthly average limit value.

#### PART 7

#### Average emission limit values for multi-fuel firing combustion plants within a refinery

Average emission limit values  $(mg/Nm^3)$  for SO<sub>2</sub> for multi-fuel firing combustion plants within a refinery, with the exception of gas turbines and gas engines, which use the distillation and conversion residues from the refining of crude-oil for own consumption, alone or with other fuels:

- (a) for combustion plants which were granted a permit before 27 November 2002 or the operators of which had submitted a complete application for a permit before that date, provided that the plant was put into operation no later than 27 November 2003: 1 000 mg/Nm<sup>3</sup>;
- (b) for other combustion plants:  $600 \text{ mg/Nm}^3$ .

These emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised  $O_2$  content of 6 % for solid fuels and 3 % for liquid and gaseous fuels.

#### ANNEX VI

Technical provisions relating to waste incineration plants and waste co-incineration plants

#### PART 1

#### Definitions

For the purpose of this Annex the following definitions shall apply:

- (a) 'existing waste incineration plant' means one of the following waste incineration plants:
  - (i) which was in operation and had a permit in accordance with applicable Union law before 28 December 2002,
  - which was authorised or registered for waste incineration and had a permit granted before 28 December 2002 in accordance with applicable Union law, provided that the plant was put into operation no later than 28 December 2003,
  - (iii) which, in the view of the competent authority, was the subject of a full request for authorisation before 28 December 2002, provided that the plant was put into operation not later than 28 December 2004;

(b) 'new waste incineration plant' means any waste incineration plant not covered by point (a).

#### PART 2

### Equivalence factors for dibenzo-p-dioxins and dibenzofurans

For the determination of the total concentration of dioxins and furans, the mass concentrations of the following dibenzo-p-dioxins and dibenzofurans shall be multiplied by the following equivalence factors before summing:

	Toxic equivalence factor
2,3,7,8 — Tetrachlorodibenzodioxin (TCDD)	1
1,2,3,7,8 — Pentachlorodibenzodioxin (PeCDD)	0,5
1,2,3,4,7,8 — Hexachlorodibenzodioxin (HxCDD)	0,1
1,2,3,6,7,8 — Hexachlorodibenzodioxin (HxCDD)	0,1
1,2,3,7,8,9 — Hexachlorodibenzodioxin (HxCDD)	0,1
1,2,3,4,6,7,8 — Heptachlorodibenzodioxin (HpCDD)	0,01
Octachlorodibenzodioxin (OCDD)	0,001
2,3,7,8 — Tetrachlorodibenzofuran (TCDF)	0,1
2,3,4,7,8 — Pentachlorodibenzofuran (PeCDF)	0,5
1,2,3,7,8 — Pentachlorodibenzofuran (PeCDF)	0,05
1,2,3,4,7,8 — Hexachlorodibenzofuran (HxCDF)	0,1
1,2,3,6,7,8 — Hexachlorodibenzofuran (HxCDF)	0,1
1,2,3,7,8,9 — Hexachlorodibenzofuran (HxCDF)	0,1
2,3,4,6,7,8 — Hexachlorodibenzofuran (HxCDF)	0,1
1,2,3,4,6,7,8 — Heptachlorodibenzofuran (HpCDF)	0,01
1,2,3,4,7,8,9 — Heptachlorodibenzofuran (HpCDF)	0,01
Octachlorodibenzofuran (OCDF)	0,001

#### PART 3

#### Air emission limit values for waste incineration plants

1. All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correcting for the water vapour content of the waste gases.

They are standardised at 11 % oxygen in waste gas except in case of incineration of mineral waste oil as defined in point 3 of Article 3 of Directive 2008/98/EC, when they are standardised at 3 % oxygen, and in the cases referred to in Point 2.7 of Part 6.

1.1. Daily average emission limit values for the following polluting substances (mg/Nm<sup>3</sup>)

Total dust	10
Gaseous and vaporous organic substances, expressed as total organic carbon (TOC)	10
Hydrogen chloride (HCl)	10
Hydrogen fluoride (HF)	1
Sulphur dioxide (SO <sub>2</sub> )	50
Nitrogen monoxide (NO) and nitrogen dioxide (NO <sub>2</sub> ), expressed as NO <sub>2</sub> for existing waste incineration plants with a nominal capacity exceeding 6 tonnes per hour or new waste incineration plants	200
Nitrogen monoxide (NO) and nitrogen dioxide (NO <sub>2</sub> ), expressed as NO <sub>2</sub> for existing waste incineration plants with a nominal capacity of 6 tonnes per hour or less	400

# 1.2. Half-hourly average emission limit values for the following polluting substances (mg/ Nm<sup>3</sup>)

	(100 %) A	(97 %) B
Total dust	30	10
Gaseous and vaporous organic substances, expressed as total organic carbon (TOC)	20	10
Hydrogen chloride (HCl)	60	10
Hydrogen fluoride (HF)	4	2
Sulphur dioxide (SO <sub>2</sub> )	200	50
Nitrogen monoxide (NO) and nitrogen dioxide (NO <sub>2</sub> ), expressed as NO <sub>2</sub> for existing waste incineration plants with a nominal capacity exceeding	400	200

6 tonnes per hour or new	
waste incineration plants	

1.3. Average emission limit values (mg/Nm<sup>3</sup>) for the following heavy metals over a sampling period of a minimum of 30 minutes and a maximum of 8 hours

Cadmium and its compounds, expressed as cadmium (Cd)	Total: 0,05
Thallium and its compounds, expressed as thallium (Tl)	
Mercury and its compounds, expressed as mercury (Hg)	0,05
Antimony and its compounds, expressed as antimony (Sb)	Total: 0,5
Arsenic and its compounds, expressed as arsenic (As)	
Lead and its compounds, expressed as lead (Pb)	
Chromium and its compounds, expressed as chromium (Cr)	
Cobalt and its compounds, expressed as cobalt (Co)	
Copper and its compounds, expressed as copper (Cu)	
Manganese and its compounds, expressed as manganese (Mn)	
Nickel and its compounds, expressed as nickel (Ni)	
Vanadium and its compounds, expressed as vanadium (V)	

These average values cover also the gaseous and the vapour forms of the relevant heavy metal emissions as well as their compounds.

1.4. Average emission limit value (ng/Nm<sup>3</sup>) for dioxins and furans over a sampling period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated in accordance with Part 2.

Dioxins and furans	0,1

- 1.5. Emission limit values (mg/Nm<sup>3</sup>) for carbon monoxide (CO) in the waste gases:
- (a) 50 as daily average value;
- (b) 100 as half-hourly average value;

(c) 150 as 10-minute average value.

The competent authority may authorise exemptions from the emission limit values set out in this point for waste incineration plants using fluidised bed technology, provided that the permit sets an emission limit value for carbon monoxide (CO) of not more than 100 mg/Nm<sup>3</sup> as an hourly average value.

2. Emission limit values applicable in the circumstances described in Article 46(6) and Article 47.

The total dust concentration in the emissions into the air of a waste incineration plant shall under no circumstances exceed  $150 \text{ mg/Nm}^3$  expressed as a half-hourly average. The air emission limit values for TOC and CO set out in points 1.2 and 1.5(b) shall not be exceeded.

3. Member States may lay down rules governing the exemptions provided for in this Part.

## PART 4

#### Determination of air emission limit values for the co-incineration of waste

1. The following formula (mixing rule) shall be applied whenever a specific total emission limit value 'C' has not been set out in a table in this Part.

The emission limit value for each relevant polluting substance and CO in the waste gas resulting from the co-incineration of waste shall be calculated as follows:

```
rX1
     C_{waste} + V_{proc} \times C_{proc}
     Vwaste + Vpeor
1
 Editorial Information
  X1
        Substituted by Corrigendum to Directive 2010/75/EU of the European Parliament and of the Council of
         24 November 2010 on industrial emissions (integrated pollution prevention and control) (Official Journal
         of the European Union L 334 of 17 December 2010).
                        waste gas volume resulting from the incineration of waste only
Vwaste
                         determined from the waste with the lowest calorific value specified in
                         the permit and standardised at the conditions given by this Directive.
                         If the resulting heat release from the incineration of hazardous waste
                        amounts to less than 10 % of the total heat released in the plant,
                         V<sub>waste</sub> must be calculated from a (notional) quantity of waste that, being
                         incinerated, would equal 10 % heat release, the total heat release being
                         fixed
                        emission limit values for waste incineration plants set out in Part 3
Cwaste
                        waste gas volume resulting from the plant process including the
V<sub>proc</sub>
                        combustion of the authorised fuels normally used in the plant (wastes
                        excluded) determined on the basis of oxygen contents at which the
                         emissions must be standardised as set out in Union or national law. In
                        the absence of legislation for this kind of plant, the real oxygen content
                         in the waste gas without being thinned by addition of air unnecessary
                         for the process must be used.
```

C <sub>proc</sub>	: emission limit values as set out in this Part for certain industrial activities or in case of the absence of such values, emission limit values of plants which comply with the national laws, regulations and administrative provisions for such plants while burning the normally authorised fuels (wastes excluded). In the absence of these measures the emission limit values set out in the permit are used. In the absence of such permit values the real mass concentrations are used.
C	: total emission limit values at an oxygen content as set out in this Part for certain industrial activities and certain polluting substances or, in case of the absence of such values, total emission limit values replacing the emission limit values as set out in specific Annexes of this Directive. The total oxygen content to replace the oxygen content for the standardisation is calculated on the basis of the content above respecting the partial volumes.
	All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correcting for the water vapour content of the waste gases.

Member States may lay down rules governing the exemptions provided for in this Part.

- 2. Special provisions for cement kilns co-incinerating waste
- 2.1. The emission limit values set out in points 2.2 and 2.3 apply as daily average values for total dust, HCl, HF, NO<sub>x</sub>, SO<sub>2</sub> and TOC (for continuous measurements), as average values over the sampling period of a minimum of 30 minutes and a maximum of 8 hours for heavy metals and as average values over the sampling period of a minimum of 6 hours and a maximum of 8 hours for dioxins and furans.

All values are standardised at 10 % oxygen.

Half-hourly average values shall only be needed in view of calculating the daily average values.

2.2. C – total emission limit values (mg/Nm<sup>3</sup> except for dioxins and furans) for the following –polluting substances

Polluting substance	С
Total dust	30
HCl	10
HF	1
NO <sub>x</sub>	500 <sup>a</sup>
Cd + Tl	0,05
Hg	0,05
$\hline \hline Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V \\$	0,5
Dioxins and furans (ng/Nm <sup>3</sup> )	0,1

**a** Until 1 January 2016, the competent authority may authorise exemptions from the limit value for  $NO_x$  for Lepol kilns and long rotary kilns provided that the permit sets a total emission limit value for  $NO_x$  of not more than 800 mg/Nm<sup>3</sup>.

2.3. C - total emission limit values (mg/Nm<sup>3</sup>) for SO<sub>2</sub> and TOC

Pollutant	С
SO <sub>2</sub>	50
ТОС	10

The competent authority may grant derogations for emission limit values set out in this point in cases where TOC and  $SO_2$  do not result from the co-incineration of waste.

2.4. C- total emission limit values for CO

The competent authority may set emission limit values for CO.

- 3. Special provisions for combustion plants co-incinerating waste
- 3.1.  $C_{\text{proc}}$  expressed as daily average values (mg/Nm<sup>3</sup>) valid until the date set out in Article 82(5)

For determining the total rated thermal input of the combustion plants, the aggregation rules as defined in Article 29 shall apply. Half-hourly average values shall only be needed in view of calculating the daily average values.

Polluting substances	< 50 MWth	50-100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	—	850	200	200
NO <sub>x</sub>	—	400	200	200
Dust	50	50	30	30

 $C_{\text{proc}}$  for solid fuels with the exception of biomass (O<sub>2</sub> content 6 %):

 $C_{\text{proc}}$  for biomass (O<sub>2</sub> content 6 %):

Polluting substances	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
$SO_2$	—	200	200	200
NO <sub>x</sub>		350	300	200
Dust	50	50	30	30

C<sub>proc</sub> for liquid fuels (O<sub>2</sub> content 3 %):

Polluting substances	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	_	850	400 to 200 (linear decrease from 100 to 300 MWth)	200
NO <sub>x</sub>	—	400	200	200
Dust	50	50	30	30

3.2. C<sub>proc</sub> expressed as daily average values (mg/Nm<sup>3</sup>) valid from the date set out in Article 82(6)

IP completion day (31 December 2020 11pm) no further amendments will be applied to this version.

For determining the total rated thermal input of the combustion plants, the aggregation rules as defined in Article 29 shall apply. Half-hourly average values shall only be needed in view of calculating the daily average values.

3.2.1.  $C_{\text{proc}}$  for combustion plants referred to in Article 30(2), with the exception of gas turbines and gas engines

Polluting substance	< 50 MWth	50-100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	—	400 for peat: 300	200	200
NO <sub>x</sub>		300 for pulverised lignite: 400	200	200
Dust	50	30	25 for peat: 20	20

C<sub>proc</sub> for solid fuels with the exception of biomass (O<sub>2</sub> content 6 %):

C<sub>proc</sub> for biomass (O<sub>2</sub> content 6 %):

Polluting substance	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	—	200	200	200
NO <sub>x</sub>	—	300	250	200
Dust	50	30	20	20

C<sub>proc</sub> for liquid fuels (O<sub>2</sub> content 3 %):

Polluting substance	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>		350	250	200
NO <sub>x</sub>		400	200	150
Dust	50	30	25	20

3.2.2.  $C_{\text{proc}}$  for combustion plants referred to in Article 30(3), with the exception of gas turbines and gas engines

 $C_{\text{proc}}$  for solid fuels with the exception of biomass (O<sub>2</sub> content 6 %):

Polluting substance	< 50 MWth	50-100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>		400 for peat: 300	200	150

			for peat: 300, except in the case of fluidised bed combustion: 250	for circulating or pressurised fluidised bed combustion or, in case of peat firing, for all fluidised bed combustion: 200
NO <sub>x</sub>		300 for peat: 250	200	150 for pulverised lignite combustion: 200
Dust	50	20	20	10 for peat: 20

C<sub>proc</sub> for biomass (O<sub>2</sub> content 6 %):

Polluting substance	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	—	200	200	150
NO <sub>x</sub>	—	250	200	150
Dust	50	20	20	20

C<sub>proc</sub> for liquid fuels (O<sub>2</sub> content 3 %):

Polluting substance	< 50 MWth	50 to 100 MWth	100 to 300 MWth	> 300 MWth
SO <sub>2</sub>	—	350	200	150
NO <sub>x</sub>		300	150	100
Dust	50	20	20	10

3.3. C — total emission limit values for heavy metals (mg/Nm<sup>3</sup>) expressed as average values over the sampling period of a minimum of 30 minutes and a maximum of 8 hours (O<sub>2</sub> content 6 % for solid fuels and 3 % for liquid fuels)

Polluting substances	С
Cd + Tl	0,05
Hg	0,05
Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V	0,5

3.4. C — total emission limit value (ng/Nm<sup>3</sup>) for dioxins and furans expressed as average value measured over the sampling period of a minimum of 6 hours and a maximum of 8 hours (O<sub>2</sub> content 6 % for solid fuels and 3 % for liquid fuels)

Polluting substance	С
Dioxins and furans	0,1

- 4. Special provisions for waste co-incineration plants in industrial sectors not covered under Points 2 and 3 of this Part
- 4.1. C total emission limit value (ng/Nm<sup>3</sup>) for dioxins and furans expressed as average value measured over the sampling period of a minimum of 6 hours and a maximum of 8 hours:

Polluting substance	С
Dioxins and furans	0,1

4.2. C – total emission limit values (mg/Nm<sup>3</sup>) for heavy metals expressed as average values over the sampling period of a minimum of 30 minutes and a maximum of 8 hours:

Polluting substances	С
Cd + Tl	0,05
Hg	0,05

## PART 5

## Emission limit values for discharges of waste water from the cleaning of waste gases

Polluting substances		Emission limit values for unfiltered samples (mg/l except for dioxins and furans)			
1.	Total suspended solids as defined in Annex I of Directive 91/271/ EEC	(95 %) 30	(100 %) 45		
2.	Mercury and its compounds, expressed as mercury (Hg)	0,03			
3.	Cadmium and its compounds, expressed as cadmium (Cd)	0,05			
4.	Thallium and its compounds, expressed as thallium (Tl)	0,05			

5.	Arsenic and its compounds, expressed as arsenic (As)	0,15
6.	Lead and its compounds, expressed as lead (Pb)	0,2
7.	Chromium and its compounds, expressed as chromium (Cr)	0,5
8.	Copper and its compounds, expressed as copper (Cu)	0,5
9.	Nickel and its compounds, expressed as nickel (Ni)	0,5
10.	Zinc and its compounds, expressed as zinc (Zn)	1,5
11.	Dioxins and furans	0,3 ng/l

#### PART 6

#### **Monitoring of emissions**

- 1. Measurement techniques
- 1.1. Measurements for the determination of concentrations of air and water polluting substances shall be carried out representatively.
- 1.2. Sampling and analysis of all polluting substances including dioxins and furans as well as the quality assurance of automated measuring systems and the reference measurement methods to calibrate them shall be carried out according to CEN-standards. If CEN standards are not available, ISO, national or other international standards which ensure the provision of data of an equivalent scientific quality shall apply. Automated measuring systems shall be subject to control by means of parallel measurements with the reference methods at least once per year.

1.3. At the daily emission limit value level, the values of the 95 % confidence intervals of a single measured result shall not exceed the following percentages of the emission limit values:

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Carbon monoxide:	10 %
Sulphur dioxide:	20 %
Nitrogen dioxide:	20 %
Total dust:	30 %
Total organic carbon:	30 %
Hydrogen chloride:	40 %
Hydrogen fluoride:	40 %.

Periodic measurements of the emissions into air and water shall be carried out in accordance with points 1.1 and 1.2.

- 2. Measurements relating to air polluting substances
- 2.1. The following measurements relating to air polluting substances shall be carried out:
- (a) continuous measurements of the following substances: NO<sub>x</sub>, provided that emission limit values are set, CO, total dust, TOC, HCl, HF, SO<sub>2</sub>;
- (b) continuous measurements of the following process operation parameters: temperature near the inner wall or at another representative point of the combustion chamber as authorised by the competent authority, concentration of oxygen, pressure, temperature and water vapour content of the waste gas;
- (c) at least two measurements per year of heavy metals and dioxins and furans; one measurement at least every 3 months shall, however, be carried out for the first 12 months of operation.
- 2.2. The residence time as well as the minimum temperature and the oxygen content of the waste gases shall be subject to appropriate verification, at least once when the waste incineration plant or waste co-incineration plant is brought into service and under the most unfavourable operating conditions anticipated.
- 2.3. The continuous measurement of HF may be omitted if treatment stages for HCl are used which ensure that the emission limit value for HCl is not being exceeded. In that case the emissions of HF shall be subject to periodic measurements as laid down in point 2.1(c).
- 2.4. The continuous measurement of the water vapour content shall not be required if the sampled waste gas is dried before the emissions are analysed.
- 2.5. The competent authority may decide not to require continuous measurements for HCl, HF and SO<sub>2</sub> in waste incineration plants or waste co-incineration plants and require periodic measurements as set out in point 2.1(c) or no measurements if the operator can prove that the emissions of those pollutants can under no circumstances be higher than the prescribed emission limit values.

The competent authority may decide not to require continuous measurements for  $NO_x$  and require periodic measurements as set out in point 2.1(c) in existing waste incineration plants with a nominal capacity of less than 6 tonnes per hour or in existing waste co-incineration plants with a nominal capacity of less than 6 tonnes per hour if the operator can prove on the basis of information on the quality of the waste concerned, the technologies used and the results of the monitoring of emissions, that the emissions of  $NO_x$  can under no circumstances be higher than the prescribed emission limit value.

- 2.6. The competent authority may decide to require one measurement every 2 years for heavy metals and one measurement per year for dioxins and furans in the following cases:
- (a) the emissions resulting from co-incineration or incineration of waste are under all circumstances below 50 % of the emission limit values;
- (b) the waste to be co-incinerated or incinerated consists only of certain sorted combustible fractions of non-hazardous waste not suitable for recycling and presenting certain characteristics, and which is further specified on the basis of the assessment referred to in point (c);
- (c) the operator can prove on the basis of information on the quality of the waste concerned and the monitoring of the emissions that the emissions are under all circumstances significantly below the emission limit values for heavy metals and dioxins and furans.
- 2.7. The results of the measurements shall be standardised using the standard oxygen concentrations mentioned in Part 3 or calculated according to Part 4 and by applying the formula given in Part 7.

When waste is incinerated or co-incinerated in an oxygen-enriched atmosphere, the results of the measurements can be standardised at an oxygen content laid down by the competent authority reflecting the special circumstances of the individual case.

When the emissions of polluting substances are reduced by waste gas treatment in a waste incineration plant or waste co-incineration plant treating hazardous waste, the standardisation with respect to the oxygen contents provided for in the first subparagraph shall be done only if the oxygen content measured over the same period as for the polluting substance concerned exceeds the relevant standard oxygen content.

- 3. Measurements relating to water polluting substances
- 3.1. The following measurements shall be carried out at the point of waste water discharge:
- (a) continuous measurements of pH, temperature and flow;
- (b) spot sample daily measurements of total suspended solids or measurements of a flow proportional representative sample over a period of 24 hours;
- (c) at least monthly measurements of a flow proportional representative sample of the discharge over a period of 24 hours of Hg, Cd, TI, As, Pb, Cr, Cu, Ni and Zn;
- (d) at least every 6 months measurements of dioxins and furans; however, one measurement at least every 3 months shall be carried out for the first 12 months of operation.
- 3.2. Where the waste water from the cleaning of waste gases is treated on site collectively with other on-site sources of waste water, the operator shall take the measurements:

- (a) on the waste water stream from the waste gas cleaning processes prior to its input into the collective waste water treatment plant;
- (b) on the other waste water stream or streams prior to its or their input into the collective waste water treatment plant;
- (c) at the point of final waste water discharge, after the treatment, from the waste incineration plant or waste co-incineration plant.

#### PART 7

## Formula to calculate the emission concentration at the standard percentage oxygen concentration

$E_S = rac{21 - \mathrm{O}_S}{21 - \mathrm{O}_M}  imes \mathrm{E}_M$	
Es	= calculated emission concentration at the standard percentage oxygen concentration
E <sub>M</sub>	= measured emission concentration
$O_S$	= standard oxygen concentration
$O_M$	= measured oxygen concentration

#### PART 8

#### Assessment of compliance with emission limit values

- 1. Air emission limit values
- 1.1. The emission limit values for air shall be regarded as being complied with if:
- (a) none of the daily average values exceeds any of the emission limit values set out in point 1.1 of Part 3 or in Part 4 or calculated in accordance with Part 4;
- (b) either none of the half-hourly average values exceeds any of the emission limit values set out in column A of the table under point 1.2 of Part 3 or, where relevant, 97 % of the half-hourly average values over the year do not exceed any of the emission limit values set out in column B of the table under point 1.2 of Part 3;
- (c) none of the average values over the sampling period set out for heavy metals and dioxins and furans exceeds the emission limit values set out in points 1.3 and 1.4 of Part 3 or in Part 4 or calculated in accordance with Part 4;
- (d) for carbon monoxide (CO):
  - (i) in case of waste incineration plants:
    - at least 97 % of the daily average values over the year do not exceed the emission limit value set out in point 1.5(a) of Part 3; and,
    - at least 95 % of all 10-minute average values taken in any 24hour period or all of the half-hourly average values taken in the same period do not exceed the emission limit values set out in points 1.5(b) and (c) of Part 3; in case of waste incineration plants in which the gas resulting from the incineration process is raised to a temperature of at least 1 100 °C for at least two seconds, Member

States may apply an evaluation period of 7 days for the 10-minute average values;

- (ii) in case of waste co-incineration plants: the provisions of Part 4 are met.
- 1.2. The half-hourly average values and the 10-minute averages shall be determined within the effective operating time (excluding the start-up and shut-down periods if no waste is being incinerated) from the measured values after having subtracted the value of the confidence interval specified in point 1.3 of Part 6. The daily average values shall be determined from those validated average values.

To obtain a valid daily average value no more than five half-hourly average values in any day shall be discarded due to malfunction or maintenance of the continuous measurement system. No more than ten daily average values per year shall be discarded due to malfunction or maintenance of the continuous measurement system.

- 1.3. The average values over the sampling period and the average values in the case of periodical measurements of HF, HCl and  $SO_2$  shall be determined in accordance with the requirements of Articles 45(1)(e), 48(3) and point 1 of Part 6.
- 2. Water emission limit values

The emission limit values for water shall be regarded as being complied with if:

- (a) for total suspended solids 95 % and 100 % of the measured values do not exceed the respective emission limit values as set out in Part 5;
- (b) for heavy metals (Hg, Cd, TI, As, Pb, Cr, Cu, Ni and Zn) no more than one measurement per year exceeds the emission limit values set out in Part 5; or, if the Member State provides for more than 20 samples per year, no more than 5 % of these samples exceed the emission limit values set out in Part 5;
- (c) for dioxins and furans, the measurement results do not exceed the emission limit value set out in Part 5.

## ANNEX VII

Technical provisions relating to installations and activities using organic solvents

## PART 1

#### Activities

- 1. In each of the following points, the activity includes the cleaning of the equipment but not the cleaning of products unless specified otherwise.
- 2. Adhesive coating

Any activity in which an adhesive is applied to a surface, with the exception of adhesive coating and laminating associated with printing activities.

3. Coating activity

Any activity in which a single or multiple application of a continuous film of a coating is applied to:

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- (a) either of the following vehicles:
  - (i) new cars, defined as vehicles of category M1 in Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles<sup>(3)</sup> and of category N1 in so far as they are coated at the same installation as M1 vehicles;
  - (ii) truck cabins, defined as the housing for the driver, and all integrated housing for the technical equipment, of vehicles of categories N2 and N3 in Directive 2007/46/EC;
  - (iii) vans and trucks, defined as vehicles of categories N1, N2 and N3 in Directive 2007/46/EC, but not including truck cabins;
  - (iv) buses, defined as vehicles of categories M2 and M3 in Directive 2007/46/ EC;
  - (v) trailers, defined in categories O1, O2, O3 and O4 in Directive 2007/46/EC;
- (b) metallic and plastic surfaces including surfaces of airplanes, ships, trains, etc.;
- (c) wooden surfaces;
- (d) textile, fabric, film and paper surfaces;
- (e) leather.

Coating activities do not include the coating of substrate with metals by electrophoretic and chemical spraying techniques. If the coating activity includes a step in which the same article is printed by whatever technique used, that printing step is considered part of the coating activity. However, printing activities operated as a separate activity are not included, but may be covered by Chapter V of this Directive if the printing activity falls within the scope thereof.

4. Coil coating

Any activity where coiled steel, stainless steel, coated steel, copper alloys or aluminium strip is coated with either a film forming or laminate coating in a continuous process.

5. Dry cleaning

Any industrial or commercial activity using volatile organic compounds in an installation to clean garments, furnishing and similar consumer goods with the exception of the manual removal of stains and spots in the textile and clothing industry.

6. Footwear manufacture

Any activity of producing complete footwear or parts thereof.

7. Manufacturing of coating mixtures, varnishes, inks and adhesives

The manufacture of the above final products, and of intermediates where carried out at the same site, by mixing of pigments, resins and adhesive materials with organic solvent or other carrier, including dispersion and predispersion activities, viscosity and tint adjustments and operations for filling the final product into its container.

### 8. Manufacturing of pharmaceutical products

The chemical synthesis, fermentation, extraction, formulation and finishing of pharmaceutical products and, where carried out at the same site, the manufacture of intermediate products.

9. Printing

Any reproduction activity of text and/or images in which, with the use of an image carrier, ink is transferred onto whatever type of surface. It includes associated varnishing, coating and laminating techniques. However, only the following sub-processes are subject to Chapter V:

- (a) flexography a printing activity using an image carrier of rubber or elastic photopolymers on which the printing areas are above the non-printing areas, using liquid inks which dry through evaporation;
- (b) heatset web offset a web-fed printing activity using an image carrier in which the printing and non-printing area are in the same plane, where web-fed means that the material to be printed is fed to the machine from a reel as distinct from separate sheets. The non-printing area is treated to attract water and thus reject ink. The printing area is treated to receive and transmit ink to the surface to be printed. Evaporation takes place in an oven where hot air is used to heat the printed material;
- (c) laminating associated to a printing activity the adhering together of two or more flexible materials to produce laminates;
- (d) publication rotogravure a rotogravure printing activity used for printing paper for magazines, brochures, catalogues or similar products, using toluene-based inks;
- (e) rotogravure a printing activity using a cylindrical image carrier in which the printing area is below the non-printing area, using liquid inks which dry through evaporation. The recesses are filled with ink and the surplus is cleaned off the non-printing area before the surface to be printed contacts the cylinder and lifts the ink from the recesses;
- (f) rotary screen printing a web-fed printing activity in which the ink is passed onto the surface to be printed by forcing it through a porous image carrier, in which the printing area is open and the non-printing area is sealed off, using liquid inks which dry only through evaporation. Web-fed means that the material to be printed is fed into the machine from a reel as distinct from separate sheets;
- (g) varnishing an activity by which a varnish or an adhesive coating for the purpose of later sealing the packaging material is applied to a flexible material.
- 10. Rubber conversion

Any activity of mixing, milling, blending, calendering, extrusion and vulcanisation of natural or synthetic rubber and any ancillary operations for converting natural or synthetic rubber into a finished product.

#### 11. Surface cleaning

Any activity except dry cleaning using organic solvents to remove contamination from the surface of material including degreasing. A cleaning activity consisting of more than one step before or after any other activity shall be considered as one surface cleaning activity. This activity does not refer to the cleaning of the equipment but to the cleaning of the surface of products.

12. Vegetable oil and animal fat extraction and vegetable oil refining activities

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## 13. Vehicle refinishing

seeds, vegetable matter and/or animal matter.

Any industrial or commercial coating activity and associated degreasing activities performing either of the following:

- (a) the original coating of road vehicles as defined in Directive 2007/46/EC or part of them with refinishing-type materials, where this is carried out away from the original manufacturing line;
- (b) the coating of trailers (including semi-trailers) (category O in Directive 2007/46/EC).
- 14. Winding wire coating

Any coating activity of metallic conductors used for winding the coils in transformers and motors, etc.

15. Wood impregnation

Any activity giving a loading of preservative in timber.

16. Wood and plastic lamination

Any activity to adhere together wood and/or plastic to produce laminated products.

#### PART 2

#### Thresholds and emission limit values

The emission limit values in waste gases shall be calculated at a temperature of 273,15 K, and a pressure of 101,3 kPa.

	consum	tiomsum			n Fugitive emission limit values (percentage of solvent input)		Total emission limit values	
	year)	year)	gases (mg C/ Nm <sup>3</sup> )	New installati	Existing o <b>in</b> stallati		Existing ioinstallati	
1	Heatset web offset printing (> 15)	15—25 > 25	100 20	30 ( <sup>1</sup> ) 30 ( <sup>1</sup> )				( <sup>1</sup> ) Solvent residue in finished product is not to be considered as part of

							fugitive emissions.
2	Publication rotogravu (> 25)		75	10	15		
3	Other rotogravu flexograp rotary screen printing, laminatin or varnishin units (> 15) rotary screen printing on textile/ cardboarc (> 30)	hy,30 ( <sup>1</sup> ) g g	100 100 100	25 20 20			( <sup>1</sup> ) Threshold for rotary screen printing on textile and on cardboard.
4	Surface cleaning using compound specified in Article 59 (> 1)	ds	20 ( <sup>1</sup> ) 20 ( <sup>1</sup> )	15 10			( <sup>1</sup> ) Limit value refers to mass of compounds in mg/ Nm <sup>3</sup> , and not to total carbon.
5	Other surface cleaning (> 2)	2—10 > 10	75 ( <sup>1</sup> ) 75 ( <sup>1</sup> )	20 ( <sup>1</sup> ) 15 ( <sup>1</sup> )			( <sup>1</sup> ) Installations which demonstrate to the competent authority that the average organic solvent content of all cleaning material used does not

							exceed 30 % by weight are exempt from application of these values.
6	Vehicle coating (< 15) and vehicle refinishin	> 0,5 g	50 ( <sup>1</sup> )	25			( <sup>1</sup> ) Compliance in accordance with point 2 of Part 8 shall be demonstrated based on 15 minute average measurements.
7	Coil coating (> 25)		50 (1)	5	10		( <sup>1</sup> ) For installations which use techniques which allow reuse of recovered solvents, the emission limit value shall be 150.
8	Other coating, including metal, plastic, textile $(^5)$ , fabric, film and paper coating (> 5)	5—15 > 15	100 ( <sup>1</sup> ) ( <sup>4</sup> ) 50/75 ( <sup>2</sup> ) ( <sup>3</sup> ) ( <sup>4</sup> )	25 ( <sup>4</sup> ) 20 ( <sup>4</sup> )	1		( <sup>1</sup> ) Emission limit value applies to coating application and drying processes operated under

			contained conditions. ( <sup>2</sup> ) The first emission limit value applies to drying processes, the second to coating application processes.
			( <sup>3</sup> ) For textile coating installations which use techniques which allow reuse of recovered solvents, the emission limit value applied to coating application and drying processes taken together shall be 150. ( <sup>4</sup> ) Coating activities which cannot be carried out

						under contained conditions (such as shipbuilding, aircraft painting) may be exempted from these values, in accordance with Article 59(3). $(^{5})$ Rotary screen printing on textile is covered by activity No 3.
9	Winding wire coating (> 5) Coating of wooden surfaces (> 15)	15—25 > 25	100 ( <sup>1</sup> ) 50/75 ( <sup>2</sup> )	25 20	10 g/kg ( <sup>1</sup> ) 5 g/kg ( <sup>2</sup> )	$\binom{1}{}$ Applies for installations where average diameter of wire $\leq 0,1$ mm. $\binom{2}{}$ Applies for all other installations. $\binom{1}{}$ Emission limit value applies to coating application and drying processes

						operated under contained conditions. ( <sup>2</sup> ) The first value applies to drying processes, the second to coating application processes.
11	Dry cleaning				20 g/kg ( <sup>1</sup> ) ( <sup>2</sup> )	( <sup>1</sup> ) Expressed in mass of solvent emitted per kilogram of product cleaned and dried. ( <sup>2</sup> ) The emission limit value in point 2 of Part 4 does not apply for this activity.
12	Wood impregnat (> 25)	tion	100 ( <sup>1</sup> )	45	11 kg/m <sup>3</sup>	( <sup>1</sup> ) Emission limit value does not apply for impregnation with creosote.

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13	Coating $10-$ of $> 25$		85 g/m <sup>2</sup> 75 g/m <sup>2</sup>	Emission limit
	leather (> 10) > 10		150 g/m <sup>2</sup>	values are expressed in grams of solvent emitted per m <sup>2</sup> of product produced. ( <sup>1</sup> ) For leather coating activities in furnishing and particular leather goods used as small consumer goods like bags, belts, wallets, etc.
14	Footwear manufacture (> 5)		25 g per pair	Total emission limit value is expressed in grams of solvent emitted per pair of complete footwear produced.
15	Wood and plastic lamination (> 5)		30 g/m <sup>2</sup>	

16	Adhesive 5—15 coating (> 5)	50 ( <sup>1</sup> ) 50 ( <sup>1</sup> )	25 20		( <sup>1</sup> ) If techniques are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150.
17	Manufactut@0—1 of 000 coating mixture, varnishes, inks and adhesives (> 100)	150 150	5 3	5 % of solvent input 3 % of solvent input	The fugitive emission limit value does not include solvent sold as part of a coatings mixture in a sealed container.
18	Rubber conversion (> 15)	20 (1)	25 ( <sup>2</sup> )	25 % of solvent input	( <sup>1</sup> ) If techniques are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150. ( <sup>2</sup> ) The fugitive emission limit

			value does not include solvent sold as part of products or mixtures in a sealed container.
19	Vegetable oil and animal fat extraction and vegetable oil refining activities (> 10)	Animal fat: 1,5 kg/ tonne Castor: 3 kg/tonne Rape seed: 1 kg/ tonne Sunflower seed: 1 kg/tonne Soya beans (normal crush): 0,8 kg/tonne Soya beans (white flakes): 1,2 kg/ tonne Other seeds and other vegetable matter: 3 kg/tonne ( <sup>1</sup> ) 1,5 kg/tonne ( <sup>2</sup> ) 4 kg/tonne ( <sup>3</sup> )	( <sup>1</sup> ) Total emission limit values for installations processing individual batches of seeds and other vegetable matter should be set by the competent authority on a case- by-case basis, applying the best available techniques. ( <sup>2</sup> ) Applies to all fractionation processes excluding de- gumming (the removal of gums from the oil).

							( <sup>3</sup> ) Applies to de- gumming.
20	Manufacturing of pharmaceutical products (> 50)	20 ( <sup>1</sup> )	5 (²)	15 (²)	5 % of solvent input	15 % of solvent input	( <sup>1</sup> ) If techniques are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150. ( <sup>2</sup> ) The fugitive emission limit value does not include solvent sold as part of products or mixtures in a sealed container.

### PART 3

#### Emission limit values for installations of the vehicle coating industry

- 1. The total emission limit values are expressed in terms of grams of organic solvent emitted in relation to the surface area of product in square metres and in kilograms of organic solvent emitted in relation to the car body.
- 2. The surface area of any product dealt with in the table under point 3 is defined as the surface area calculated from the total electrophoretic coating area, and the surface area of any parts that might be added in successive phases of the coating process which are coated with the same coatings as those used for the product in question, or the total surface area of the product coated in the installation.

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The surface of the electrophoretic coating area is calculated using the following formula: <sup>2 × total weight of product shell average thickness of metal sheet × density of metal sheet</sup>

This method shall also be applied for other coated parts made out of sheets.

Computer aided design or other equivalent methods shall be used to calculate the surface area of the other parts added, or the total surface area coated in the installation.

3. The total emission limit values in the table below refer to all process stages carried out at the same installation from electrophoretic coating, or any other kind of coating process, through to the final wax and polish of topcoating inclusive, as well as solvent used in cleaning of process equipment, including spray booths and other fixed equipment, both during and outside of production time.

Activity(solvent	Production	Total emission limit value			
consumption threshold in tonnes/year)	threshold(refers to annual production of coated item)	New installations	Existing installations		
Coating of new cars (> 15)	> 5 000	45 g/m <sup>2</sup> or 1,3 kg/ body + 33 g/m <sup>2</sup>	60 g/m <sup>2</sup> or 1,9 kg/ body + 41 g/m <sup>2</sup>		
	$\leq$ 5 000 monocoque or > 3 500 chassis- built	90 g/m <sup>2</sup> or 1,5 kg/ body + 70 g/m <sup>2</sup>	90 g/m <sup>2</sup> or 1,5 kg/ body + 70 g/m <sup>2</sup>		
		Total emission limit value (g/m <sup>2</sup> )			
Coating of new truck	≤ 5 000	65	85		
cabins (> 15)	> 5 000	55	75		
Coating of new vans	≤ 2 500	90	120		
and trucks (> 15)	> 2 500	70	90		
Coating of new buses	≤ 2 000	210	290		
(> 15)	> 2 000	150	225		

4. Vehicle coating installations below the solvent consumption thresholds mentioned in the table under point 3 shall meet the requirements for the vehicle refinishing sector set out in Part 2.

#### PART 4

#### Emission limit values relating to volatile organic compounds with specific risk phrases

1. For emissions of the volatile organic compounds referred to in Article 58 where the mass flow of the sum of the compounds causing the labelling referred to in that Article is greater than, or equal to, 10 g/h, an emission limit value of 2 mg/Nm<sup>3</sup> shall be complied with. The emission limit value refers to the mass sum of the individual compounds.

2. For emissions of halogenated volatile organic compounds which are assigned or need to carry the hazard statements H341 or H351, where the mass flow of the sum of the compounds causing the hazard statements H341 or H351 is greater than, or equal to, 100 g/h, an emission limit value of 20 mg/Nm<sup>3</sup> shall be complied with. The emission limit value refers to the mass sum of the individual compounds.

# PART 5

#### **Reduction scheme**

- 1. The operator may use any reduction scheme, specially designed for his installation.
- 2. In the case of applying coatings, varnishes, adhesives or inks, the following scheme can be used. Where the following method is inappropriate, the competent authority may allow an operator to apply any alternative scheme achieving equivalent emission reductions to those achieved if the emission limit values of Parts 2 and 3 were to be applied. The design of the scheme shall take into account the following facts:
- (a) where substitutes containing little or no solvent are still under development, a time extension shall be given to the operator to implement his emission reduction plans;
- (b) the reference point for emission reductions should correspond as closely as possible to the emissions which would have resulted had no reduction action been taken.
- 3. The following scheme shall operate for installations for which a constant solid content of product can be assumed:
- (a) The annual reference emission is calculated as follows:
  - (i) The total mass of solids in the quantity of coating and/or ink, varnish or adhesive consumed in a year is determined. Solids are all materials in coatings, inks, varnishes and adhesives that become solid once the water or the volatile organic compounds are evaporated.
  - (ii) The annual reference emissions are calculated by multiplying the mass determined in (i) by the appropriate factor listed in the table below. Competent authorities may adjust these factors for individual installations to reflect documented increased efficiency in the use of solids.

Activity	Multiplication factor for use in item (a)(ii)
Rotogravure printing; flexography printing; laminating as part of a printing activity; varnishing as part of a printing activity; wood coating; coating of textiles, fabric film or paper; adhesive coating	4
Coil coating, vehicle refinishing	3
Food contact coating, aerospace coatings	2,33
Other coatings and rotary screen printing	1,5

- (b) The target emission is equal to the annual reference emission multiplied by a percentage equal to:
  - (i) (the fugitive emission limit value + 15), for installations falling within item 6 and the lower threshold band of items 8 and 10 of Part 2,
  - (ii) (the fugitive emission limit value + 5) for all other installations.
- (c) Compliance is achieved if the actual solvent emission determined from the solvent management plan is less than or equal to the target emission.

# PART 6

# **Emission monitoring**

- 1. Channels to which abatement equipment is connected, and which at the final point of discharge emit more than an average of 10 kg/h of total organic carbon, shall be monitored continuously for compliance.
- 2. In the other cases, Member States shall ensure that either continuous or periodic measurements are carried out. For periodic measurements at least three measurement values shall be obtained during each measurement exercise.
- 3. Measurements are not required in the case where end-of-pipe abatement equipment is not needed to comply with this Directive.

# PART 7

# Solvent management plan

1. Principles

The solvent management plan shall be used to:

- (a) verify compliance as specified in Article 62;
- (b) identify future reduction options;
- (c) enable provision of information on solvent consumption, solvent emissions and compliance with the requirements of Chapter V to the public.
- 2. Definitions

The following definitions provide a framework for the mass balance exercise.

Inputs of organic solvents (I):

- I1 The quantity of organic solvents or their quantity in mixtures purchased which are used as input into the process in the time frame over which the mass balance is being calculated.
- I2 The quantity of organic solvents or their quantity in mixtures recovered and reused as solvent input into the process. The recycled solvent is counted every time it is used to carry out the activity.

Outputs of organic solvents (O):

O1 Emissions in waste gases.

02	Organic solvents lost in water, taking into account waste water treatment when calculating O5.
03	The quantity of organic solvents which remains as contamination or residue in products output from the process.
O4	Uncaptured emissions of organic solvents into air. This includes the general ventilation of rooms, where air is released to the outside environment via windows, doors, vents and similar openings.
05	Organic solvents and/or organic compounds lost due to chemical or physical reactions (including those which are destroyed, by incineration or other waste gas or waste water treatments, or captured, as long as they are not counted under O6, O7 or O8).
06	Organic solvents contained in collected waste.
07	Organic solvents, or organic solvents contained in mixtures, which are sold or are intended to be sold as a commercially valuable product.
08	Organic solvents contained in mixtures recovered for reuse but not as input into the process, as long as not counted under O7.
09	Organic solvents released in other ways.
3.	Use of the solvent management plan for verification of compliance.

The use made of the solvent management plan shall be determined by the particular requirement which is to be verified, as follows:

- (a) verification of compliance with the reduction scheme as set out in Part 5, with a total emission limit value expressed in solvent emissions per unit product, or otherwise stated in Parts 2 and 3.
  - (i) for all activities using the reduction scheme as set out in Part 5, the solvent management plan shall be drawn up annually to determine the consumption (C). The consumption shall be calculated according to the following equation:

C = I1 - O8

A parallel exercise shall also be undertaken to determine solids used in coating in order to derive the annual reference emission and the target emission each year.

(ii) for assessing compliance with a total emission limit value expressed in solvent emissions per unit product or otherwise stated in Parts 2 and 3, the solvent management plan shall be drawn up annually to determine the emissions (E). The emissions shall be calculated according to the following equation:

 $\mathbf{E} = \mathbf{F} + \mathbf{O1}$ 

Where F is the fugitive emission as defined in point (b)(i). The emission figure shall then be divided by the relevant product parameter.

(iii) for assessing compliance with the requirements of point (b)(ii) of Article 59(6), the solvent management plan shall be drawn up annually to determine total emissions from all activities concerned, and that figure shall then be compared with the total emissions that would have resulted had the requirements of Parts 2, 3 and 5 been met for each activity separately.

- (b) Determination of fugitive emissions for comparison with the fugitive emission limit values in Part 2:
  - (i) The fugitive emission shall be calculated according to one of the following equations;

$$F = I1 - O1 - O5 - O6 - O7 - O8$$

or

F = O2 + O3 + O4 + O9

F shall be determined either by direct measurement of the quantities or by an equivalent method or calculation, for instance by using the capture efficiency of the process.

The fugitive emission limit value is expressed as a proportion of the input, which shall be calculated according to the following equation:

I = I1 + I2

(ii) Determination of fugitive emissions shall be done by a short but comprehensive set of measurements and needs not be done again until the equipment is modified.

# PART 8

#### Assessment of compliance with emission limit values in waste gases

- 1. In the case of continuous measurements the emission limit values shall be considered to be complied with if:
- (a) none of the arithmetic averages of all valid readings taken during any 24-hour period of operation of an installation or activity except start-up and shut-down operations and maintenance of equipment exceeds the emission limit values,
- (b) none of the hourly averages exceeds the emission limit values by more than a factor of 1,5.
- 2. In the case of periodic measurements the emission limit values shall be considered to be complied with if, in one monitoring exercise:
- (a) the average of all the measurement values does not exceed the emission limit values,
- (b) none of the hourly averages exceeds the emission limit value by more than a factor of 1,5.
- 3. Compliance with Part 4 shall be verified on the basis of the sum of the mass concentrations of the individual volatile organic compounds concerned. For all other cases, compliance shall be verified on the basis of the total mass of organic carbon emitted unless otherwise specified in Part 2.
- 4. Gas volumes may be added to the waste gas for cooling or dilution purposes where technically justified but shall not be considered when determining the mass concentration of the pollutant in the waste gas.

# ANNEX VIII

# Technical provisions relating to installations producing titanium dioxide

# PART 1

#### Emission limit values for emissions into water

1. In case of installations using the sulphate process (as an annual average):

550 kg of sulphate per tonne of titanium dioxide produced.

- 2. In case of installations using the chloride process (as an annual average):
- (a) 130 kg chloride per tonne of titanium dioxide produced using neutral rutile,
- (b) 228 kg chloride per tonne of titanium dioxide produced using synthetic rutile,
- (c) 330 kg chloride per tonne of titanium dioxide produced using slag. Installations discharging into salt water (estuarine, coastal, open sea) may be subject to an emission limit value of 450 kg chloride per tonne of titanium dioxide produced using slag.
- 3. For installations using the chloride process and using more than one type of ore, the emission limit values in point 2 shall apply in proportion to the quantity of the ores used.

# PART 2

# Emission limit values into air

- 1. The emission limit values which are expressed as concentrations in mass per cubic meter (Nm<sup>3</sup>) shall be calculated at a temperature of 273,15 K, and a pressure of 101,3 kPa.
- 2. For dust: 50 mg/Nm<sup>3</sup> as an hourly average from major sources and 150 mg/Nm<sup>3</sup> as an hourly average from any other source.
- 3. For gaseous sulphur dioxide and trioxide discharged from digestion and calcination, including acid droplets calculated as SO<sub>2</sub> equivalent:
- (a) 6 kg per tonne of titanium dioxide produced as an annual average;
- (b)  $500 \text{ mg/Nm}^3$  as an hourly average for plants for the concentration of waste acid.
- 4. For chlorine in the case of installations using the chloride process:
- (a)  $5 \text{ mg/Nm}^3$  as a daily average;
- (b)  $40 \text{ mg/Nm}^3$  at any time.

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# PART 3

#### **Emission monitoring**

The monitoring of emissions into air shall include at least the continuous monitoring of:

- (a) gaseous sulphur dioxide and trioxide discharged from digestion and calcination from plants for the concentration of waste acid in installations using the sulphate process;
- (b) chlorine from major sources within installations using the chloride process;
- (c) dust from major sources.

# ANNEX IX

# PART A

# REPEALED DIRECTIVES WITH THEIR SUCCESSIVE AMENDMENTS

(referred to in Article 81)	
Council Directive 78/176/EEC (OJ L 54, 25.2.1978, p. 19).	
Council Directive 83/29/EEC (OJ L 32, 3.2.1983, p. 28).	
Council Directive 91/692/EEC (OJ L 377, 31.12.1991, p. 48).	only Annex I, point (b)
Council Directive 82/883/EEC (OJ L 378, 31.12.1982, p. 1).	
Act of Accession of 1985	only Annex I, point X.1(o)
Act of Accession of 1994	only Annex I, point VIII.A.6
Council Regulation (EC) No 807/2003 (OJ L 122, 16.5.2003, p. 36).	only Annex III, point 34
Regulation (EC) No 219/2009 of the European Parliament and of the Council (OJ L 87, 31.3.2009, p. 109).	only Annex, point 3.1
Council Directive 92/112/EEC (OJ L 409, 31.12.1992, p. 11).	
Council Directive 1999/13/EC (OJ L 85, 29.3.1999, p. 1).	
Regulation (EC) No 1882/2003 of the European Parliament and of the Council (OJ L 284, 31.10.2003, p. 1).	only Annex I, point 17
Directive 2004/42/EC of the European Parliament and of the Council (OJ L 143, 30.4.2004, p. 87).	only Article 13(1)

Directive 2008/112/EC of the European Parliament and of the Council (OJ L 345, 23.12.2008, p. 68).	only Article 3
Directive 2000/76/EC of the European Parliament and of the Council (OJ L 332, 28.12.2000, p. 91).	
Regulation (EC) No 1137/2008 of the European Parliament and of the Council (OJ L 311, 21.11.2008, p. 1).	only Annex, point 4.8
Directive 2001/80/EC of the European Parliament and of the Council (OJ L 309, 27.11.2001, p. 1).	
Council Directive 2006/105/EC (OJ L 363, 20.12.2006, p. 368).	only Annex, part B, point 2
Directive 2009/31/EC of the European Parliament and of the Council (OJ L 140, 5.6.2009, p. 114).	only Article 33
Directive 2008/1/EC of the European Parliament and of the Council (OJ L 24, 29.1.2008, p. 8).	
Directive 2009/31/EC of the European Parliament and of the Council (OJ L 140, 5.6.2009, p. 114).	only Article 37

# PART B

# LIST OF TIME-LIMITS FOR TRANSPOSITION INTO NATIONAL LAW AND APPLICATION

Directive	Time-limit for transposition	Time-limit for application
78/176/EEC	25 February 1979	
82/883/EEC	31 December 1984	
92/112/EEC	15 June 1993	
1999/13/EC	1 April 2001	
2000/76/EC	28 December 2000	28 December 2002 28 December 2005
2001/80/EC	27 November 2002	27 November 2004
2003/35/EC	25 June 2005	

a Directive 2008/1/EC is a codified version of Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (OJ L 257, 10.10.1996, p. 26) and the time-limits for transposition and application remain in force.

2003/87/EC	31 December 2003	
2008/1/EC	30 October 1999 <sup>a</sup>	30 October 1999 30 October 2007

a Directive 2008/1/EC is a codified version of Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (OJ L 257, 10.10.1996, p. 26) and the time-limits for transposition and application remain in force.

# ANNEX X

#### Correlation Table

Directive 78/176/ EEC	Directive 82/883/ EEC	Directive 92/112/ EEC	Directive 2008/1/ EC	Directive 1999/13/ EC	Directive 2000/76/ EC	Directive 2001/80/ EC	This Directive
Article 1(1)	)Article 1	Article 1					Article 66
							Article 2
Article 1(2) point (a)	),		Article 2(2	)			Article 3(2)
Article 1(2) point (b)	),				Article 3(1)	)	Article 3(37)
Article 1(2) points (c), (d) and (e)	),						
							Article 66
Article 2							Article 67
Article 3							Article 11, points (d) and (e)
Article 4			Article 4	Article 3, introductor wording and (1)	Article 4(1) y	)	Article 4(1), first subparagraph
Article 5							Article 11, points (d) and (e)
Article 6							Article 11, points (d) and (e)
Article 7(1)	)	Article 10					Article 70(1) and 70(2), first sentence

Article 7(2) and (3)	)						
							Article 70(2), second sentence and 70(3)
Article 8(1)	)						
Article 8(2)	)						Article 26(1), second subparagraph
Article 9							
Article 10							
Article 11							Article 12
Article 12							
Article 13(	1)		Article 17( first subparagra and 17(3), first subparagra first sentence	and 11(2)	1),		Article 72(1), first sentence
_	—			—			Article 72(1), second sentence
Article 13( (3) and (4)	2),						
Article 14							
Article 15	Article 14	Article 12	Article 21	Article 15	Article 21	Article 18( and (3)	1Article 80
Article 16	Article 15	Article 13	Article 23	Article 17	Article 23	Article 20	Article 84
Annex I							_
Annex II section A introductor wording and point 1	у						
Annex II section A point 2							

<i>Status:</i> EU Directives are being published on this site to aid cross referencing from UK legislation. After
IP completion day (31 December 2020 11pm) no further amendments will be applied to this version.

Annex II section B							
	Article 2						
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	Article 4(2 second subparagra						
	Article 4(3 and (4)	)					
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	Article 7						
	Article 8						
	Article 9						
	Article 10						
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	Article 12						
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Article 2(1) (a), second indent	Article 67, point (b)
Article 2(1) (a), third indent and 2(1) (b), third indent	Article 67, point (d)
Article 2(1) (a), fourth, fifth, sixth and seventh indent	
Article 2(1) (b), introductory wording and first, fourth, fifth, sixth and seventh indent	
Article 2(1) (b), second indent	Article 67, point (c)
Article 2(1) (c)	
Article 2(2)	
Article 3	Article 67
Article 4	Article 67
Article 5	—
Article 6, first paragraph, introductory wording	Article 68

Article 6, first paragraph, point (a)	Annex VIII, Part 1, point 1
Article 6, first paragraph, point (b)	Annex VIII, Part 1, point 2
Article 6, second paragraph	Annex VIII, Part 1, point 3
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Article 8	—
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Article 9(1) (a)(i)	Annex VIII, Part 2, point 2
Article 9(1) (a)(ii)	Annex VIII, Part 2, point 3, introductory wording, and point 3(a)
Article 9(1) (a)(iii)	Article 69(1)
Article 9(1) (a)(iv)	Annex VIII, Part 2, point 3(b)
Article 9(1) (a)(v)	
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Article 11	Article 11, points (d) and (e)

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		Article 2(6 second sentence	),			Article 15(1)
		Article 2(7	)			Article 3(6)
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		Article 6(1 first subparagra				Article 12(1), first subparagraph,

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		Article 6(1 first subparagra point (e)			Article 12(1), first subparagraph, point (f)
		Article 6(1 first subparagra point (f)			Article 12(1), first subparagraph, point (g)
		Article 6(1 first subparagra point (g)			Article 12(1), first subparagraph, point (h)
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		Article 11(5)	Annex VI, Part 6, point 2.4
		Article 11(6)	Annex VI, Part 6, point 2.5, first subparagraph
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- (**1**) OJ L 135, 30.5.1991, p. 40.
- (**2**) OJ L 182, 16.7.1999, p. 1.
- (**3**) OJ L 263, 9.10.2007, p. 1.