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**GOVERNMENT NOTICE**

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**DEPARTMENT OF ENVIRONMENTAL AFFAIRS****No. 248****31 March 2010****NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004)****LIST OF ACTIVITIES WHICH RESULT IN ATMOSPHERIC EMISSIONS WHICH HAVE OR MAY HAVE A SIGNIFICANT DETRIMENTAL EFFECT ON THE ENVIRONMENT, INCLUDING HEALTH, SOCIAL CONDITIONS, ECONOMIC CONDITIONS, ECOLOGICAL CONDITIONS OR CULTURAL HERITAGE**

I, Buyelwa Patience Sonjica, Minister of Water and Environmental Affairs, hereby establishes the list of activities as contemplated in Section 21(1)(a) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) and the minimum emission standards for these listed activities as contemplated in Section 21(3)(a) and (b) of the Act as set out in the Schedule hereto.

In terms of Section 21(3)(c) of the Act, 1 April 2010 is the date on which this Notice takes effect.



**BUYELWA SONJICA, MP**  
**MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS**  
**DATE: 2010-03-09**

LISTED ACTIVITIES AND ASSOCIATED MINIMUM EMISSION STANDARDS IDENTIFIED IN TERMS OF SECTION 21 OF THE  
NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004)

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*Part 1:Definitions*

**1. Definitions**

- (1) In this Notice a word or expression to which a meaning has been assigned in the Act has that meaning and, unless the context otherwise indicates: –

“**Act**” means the National Environmental Management: Air Quality Act 2004 (Act No.39 of 2004).

“**Alternative fuels and resources**” means general and hazardous waste materials or secondary products from other industries which are used to substitute conventional or primary fossil fuel and/or virgin raw materials in cement kilns and other industrial processes.

“**Atmospheric Emission License**” means an atmospheric emission license contemplated in Chapter 5 of the Act.

“**Biomass**” means non-fossilised and biodegradable organic material originating from plants, animals and micro-organisms excluding – (a) sewage; and (b) treated or coated wood waste which may contain halogenated organic compounds or heavy metals.

“**Design capacity**” means capacity as installed.

“**Existing Plant**” shall mean any plant or process that was legally authorized to operate before the date on which this Notice takes effect or any plant where an application for authorisation in

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terms of the National Environmental Management Act 1998 (Act No.107 of 1998), as amended, was made before the date on which this Notice takes effect.

**“Flare”** means a combustion device that uses an open flame to burn combustible gases with combustion air provided by ambient air around the flame. Combustion may be steam or air assisted. Flares may be either continuous or intermittent. This term includes both ground and elevated flares.

**“Fugitive emissions”** means emissions to the air from a facility for which an emission licence has been issued, other than those emitted from a point source.

**“Licensing authority”** means an authority referred to in sections 36(1), (2), (3) or (4) responsible for implementing the licensing system set out in Chapter 5 of the Act.

**“Listed activities”** includes the singular.

**“New Plant”** shall mean any plant or process where the application for authorisation in terms of the National Environmental Management Act 1998 (Act No.107 of 1998), as amended, was made on or after the date on which this Notice takes effect.

**“Normal operating condition”** means: any condition that constitutes operation as designed.

**“Oxides of nitrogen (NO<sub>x</sub>)”** means the sum of nitrogen oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) expressed as nitrogen dioxide (NO<sub>2</sub>)

**“Particulate Matter (PM)”** means total particulate matter, that is the solid matter contained in the gas stream in the solid state as well as the insoluble and soluble solid matter contained in entrained droplets in the gas stream, as measured by the appropriate method listed in section 4.

**“Petrochemicals”** means ethylene and its polymers, ethylene oxide, ethylene glycol, glycol ethers, ethoxylates, vinyl acetate, 1,2-dichloroethane, trichloroethylene, tetrachloroethylene, vinyl chloride, propylene, propyl alcohols, acrylonitrile, propylene oxide, isomers of butylene, butyl ethers, butadienes, polyolefins and alpha-olefins, all alcohols (except those produced during the production of beverages), acrylic acid, allyl chloride, epichlorohydrin, benzene and alkylbenzenes, toluene, o-, m- and p-xylene, ethylbenzene, styrene, cumene, phenols, acetone, cyclohexane, adipic acid, nitrobenzene, chlorobenzene, aniline, methylene diphenyl diisocyanate (MDI), toluene di-isocyanate or other di-isocyanates of comparable volatility, benzoic acid.

**“Point source”** means a single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys.

**“SANAS”** means the South African National Accreditation System established by Section 3 of the Accreditation for Conformity Assessment Calibration and Good Laboratory Practice, 2006 (Act No. 19 of 2006).

**“Sulphur Recovery Plant”** means a process unit that processes sulphur containing gases obtained from the processing of crude mineral oil or the coking or gasification of coal and produces a final product of elemental sulphur.

**“Upset conditions”** means any temporary failure of air pollution control equipment or process equipment or failure of a process to operate in a normal or usual manner that leads to an emission standard being exceeded.

**“Total Volatile Organic Compounds”** means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

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*Part 2: General*

**2. Applicability of the Notice**

- (1) Minimum emission standards as contained in this Notice shall apply to both permanently operated plants and for experimental (pilot) plants with a design capacity equivalent to the one of a listed activity.
- (2) Minimum emission standards are applicable under normal working conditions.
- (3) Should normal start-up, maintenance, upset and shut-down conditions exceed a period of 48 hours, Section 30 of the National Environmental Management, 1998 (Act No. 107 of 1998), as amended, shall apply unless otherwise specified by the Licensing Authority.

**3. Averaging Period**

Unless where specified, minimum emission standards are expressed on a daily average basis, under normal conditions of 273 K, 101.3 kPa, specific oxygen percentage and dry gas.

**4. Emission measurement**

- (1) The manner in which measurements of minimum emissions standards, as required by Section 21(3)(a)(ii) of the Act, shall be carried out must be in accordance with the standard sampling and analysis methods listed in Schedule A of the Notice.
- (2) Methods other than those contained in Schedule A may be used with the written consent of the National Air Quality Officer.
- (3) In seeking the written consent referred to in 4(2), an applicant must provide the National Air Quality Officer with any information that supports the equivalence of the method other than that contained in Schedule A to a method contained in Schedule A.

**5. Compliance time frames**

- (1) New plant must comply with the new plant minimum emission standards as contained in Part 3 on the date of publication of this Notice.
- (2) Existing plant must comply with minimum emission standards for existing plant as contained in Part 3 within 5 years of the date of publication of this Notice.
- (3) Existing plant must comply with minimum emission standards for new plant as contained in Part 3 within 10 years of the date of publication of this Notice.

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**6. Postponement of compliance time frames**

- (1) As contemplated in Section 5.4.3.5 of the 2007 National Framework for Air Quality Management in the Republic of South Africa (2007) published in terms of Section 7 of the Act, an application may be made to the National Air Quality Officer for the postponement of the compliance time frames in Section 5 for an existing plant.
- (2) The application contemplated in 6(1) must include –
  - (a) an Atmospheric Impact Report in terms of Section 30 of the Act, compiled by a person registered as a professional engineer or as a professional natural scientist in the appropriate category;
  - (b) a detailed justification and reasons for the application; and
  - (c) a certified copy of the announcement of the intention to seek postponement in, at least, one newspaper distributed in the area affected by the specific plant.
- (3) The National Air Quality Officer, with the concurrence of the Licensing Authority as contemplated in Section 36 of the Act, may grant a postponement of the compliance time frames in 5 for an existing plant for a period, not exceeding 5 years.
- (4) The National Air Quality Officer, with the concurrence of the Licensing Authority, may –
  - (a) from time to time review any postponement granted in terms of 6(3) should ambient air quality conditions in the affected area of the plant not conform to ambient air quality standards; and
  - (b) on good grounds, withdraw any postponement following –
    - (i) representations from the affected plant; and
    - (ii) representations from the affected communities.

**7. Compliance monitoring**

- (1) Where continuous emission monitoring is required for a listed activity in terms of the minimum emission standards as contained in Part 3 –
  - (a) the averaging period for the purposes of compliance monitoring shall be one calendar month or as prescribed in the Atmospheric Emission License as contemplated in Section 22 of the Act.
  - (b) the emission monitoring system must be maintained to yield a minimum of 80% valid hourly average values during the reporting period.
  - (c) no more than five half-hourly average values in any day, and no more than ten daily average values per year, may be discarded due to malfunction or maintenance of the continuous measurement system.
  - (d) continuous emission monitoring systems must be audited by an SANAS accredited laboratory at least once every two (2) years.
- (2) Where periodic emission monitoring is required for a listed activity in terms of the minimum emission standards as contained in Part 3 –
  - (a) emission measurement will be conducted in accordance with Section 4.

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- (b) measurements shall take place on, at least, an annual basis unless otherwise prescribed in the Atmospheric Emission License as contemplated in Section 22 of the Act.
- (c) sampling will take place using the permitted feed-stock or raw material and under operating conditions that are representative of operating conditions in the reporting period.
- (d) all tests will be conducted by SANAS accredited laboratories or laboratories accredited by similar foreign authorities.

## 8. Reporting Requirements

- (1) Notwithstanding the compliance time frames established in terms of Section 5, the Atmospheric Emission License holder shall submit an emission report in the form specified by the National Air Quality Officer to the Licensing Authority --
  - (a) within one (1) year of the date of publication of this Notice; and
  - (b) annually thereafter unless otherwise prescribed in the Atmospheric Emission License as contemplated in Section 22 of the Act.
- (2) The report contemplated in 8(1) shall include --
  - (a) The name, description and license reference number of the plant as reflected in the Atmospheric Emission License.
  - (b) Where periodic emission monitoring is required for a listed activity in terms of the minimum emission standards as contained in Part 3 --
    - (i) the name and address of the accredited measurement service-provider that carried out or verified the emission test, including the test report produced by the accredited measurement service-provider;
    - (ii) the date and time on which the emission test was carried out;
    - (iii) a declaration by the Atmospheric Emission License holder to the effect that normal operating conditions were maintained during the emission tests;
    - (iv) the total volumetric flow of gas, expressed in normal cubic meters (Nm<sup>3</sup>) per unit time and mass flow (kg per unit time) being emitted by the listed activity or activities measured during the emission test, as the average of at least two (2) measurements;
    - (v) the concentration or mass of pollutant for which emissions standards have been set in this Notice emitted by listed activity or activities as the average of at least two (2) measurements; each measured over a minimum sample period of 60 minutes and a maximum of 8 hours to obtain a representative sample, and
    - (vi) the method or combination of methods used for determining the flow rate and concentration as contemplated in Section 4.
  - (c) Where continuous emission monitoring is required for a listed activity in terms of the minimum emission standards as contained in Part 3: --
    - (i) results of the spot measurements or correlation tests carried out to verify the accuracy of the continuous emission measurements;
    - (ii) the most recent correlation tests; and



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- (iii) the availability of the system as contemplated in 7(1)(b) in terms of the number of full hours per annum that valid results were obtained.
  - (d) Following the compliance time frames established in terms of Section 5, an explanation of all instances where minimum emission standards were exceeded and remediation measures and associated implementation plans aimed at ensuring that the exceedences do not re-occur.
  - (e) Any other relevant information as required by the National Air Quality Officer from time to time.
- (3) Within three (3) years of the date of publication of this Notice, the National Air Quality Officer will establish an internet-based National Atmospheric Emission Inventory as a component of the South African Air Quality Information System (SAAQIS). Once established, the reports contemplated in 8(1) must be made in the format required for the internet-based National Atmospheric Emission Inventory.

#### 9. General special arrangement

A fugitive emissions management plan must be included in the Atmospheric Emission Licenses for listed activities that are likely to generate such emissions.

#### Part 3: Minimum Emission Standards

#### 10. Category 1: Combustion Installations

##### (1) Subcategory 1.1: Solid fuel combustion installations

<b>Description:</b>	Solid fuels (excluding biomass) combustion installations used primarily for steam raising or electricity generation.		
<b>Application:</b>	All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa:</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	3500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	750
		Existing	1100

- (a) The following special arrangement shall apply –
  - (i) Continuous emission monitoring of PM, SO<sub>2</sub> and NO<sub>x</sub> is required.

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*(2)Subcategory 1.2: Liquid fuel combustion installations*

<b>Description:</b>	Liquid fuels combustion installations used primarily for steam raising or electricity generation, except reciprocating engines.		
<b>Application:</b>	All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 3% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	75
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	3500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	250
		Existing	1100

- (a) The following special arrangements shall apply –
- (i) Reference conditions for gas turbines shall be 15% O<sub>2</sub>, 273K and 101.3kPa
  - (ii) Continuous emission monitoring of PM, SO<sub>2</sub> and NO<sub>x</sub> is required.
  - (iii) Combustion of waste oil shall be subject to emission standards of Category 8: Disposal of hazardous and general waste.

*(3)Subcategory 1.3: Solid biomass combustion installations*

<b>Description:</b>	Solid biomass fuel combustion installations used primarily for steam raising or electricity generation.		
<b>Application:</b>	All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 10% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	3500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	750
		Existing	1100

- (a) The following special arrangement shall apply –
- (i) Continuous emission monitoring of PM, SO<sub>2</sub> and NO<sub>x</sub> is required.

*(4)Subcategory 1.4: Gas combustion installations*

<b>Description:</b>	Gas combustion (including gas turbines burning natural gas) used primarily for steam raising or electricity generation, except reciprocating engines.		
<b>Application:</b>	All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 3% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	NA	New	10
		Existing	10
Sulphur dioxide	SO <sub>2</sub>	New	400
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	50
		Existing	300

- (a) The following special arrangements shall apply –
- (i) Reference conditions for gas turbines shall be 15% O<sub>2</sub>, 273K and 101.3kPa.

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- (ii) The limit for sulphur dioxide for new installations using low-calorific value gases from coal or refinery waste gasification and coke production shall be 400 mg/Nm<sup>3</sup>.

**11. Category 2: Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass**

*(1) Subcategory 2.1: Combustion installations*

<b>Description:</b>	Combustion installations not used primarily for steam raising or electricity generation.		
<b>Application:</b>	All combustion installations (except test or experimental) including catalytic cracking regenerators.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	120
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	250
		Existing	1700
		<b>Daily average kg SO<sub>2</sub> / ton of crude oil throughput.</b>	
Sulphur dioxide	SO <sub>2</sub>	New	0.4
		Existing	0.8

- (a) The following special arrangements shall apply:
- (i) The oxides of nitrogen shall be calculated as a flow-weighted average over all combustion processes.
  - (ii) No continuous flaring of hydrogen sulphide-rich gases shall be allowed.
  - (iii) Allowable SO<sub>2</sub> emissions from a refinery will be calculated as the sum of emissions from combustion, sulphur recovery units, flares and catalytic cracking units. For purposes of this calculation, catalytic cracking emissions will be calculated as if feed is not hydro-treated by the most appropriate method for each facility as approved by the licensing authority.

*(2) Subcategory 2.2: Storage and Handling of Petroleum Products*

<b>Description:</b>	Petroleum product storage tanks and product transfer facilities, except those used for liquefied petroleum gas.		
<b>Application:</b>	All permanent immobile liquid storage tanks larger than 500 cubic meters cumulative tankage capacity at a site.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Total volatile organic compounds from vapour recovery/ destruction units.	N/A	New	150
		Existing	150
		<b>g/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>	
Total volatile organic compounds from vapour recovery/ destruction units (Non thermal treatment) (Thermal treatment).	N/A	New	40
		Existing	40

- (a) The following transitional arrangements shall apply:
- (i) Leak detection and repair (LDAR) program approved by licensing authority to be instituted, within two (2) years following the date of publication of this Notice.
- (b) The following special arrangements shall apply for control of TVOCs from storage, loading and unloading of raw materials, intermediate and final products with a vapour pressure of > 14kPa at operating temperature, except during loading and unloading. Alternative control measures that can achieve the same or better results may be used. -

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- (i) Storage vessels for liquids shall be of the following type:

True vapour pressure of contents at storage temperature	Type of tank or vessel
Up to 14 kPa	Fixed roof tank vented to atmosphere.
Above 14 kPa up to 91 kPa	External floating roof tank with primary and secondary rim seals for tank diameter larger than 20m, or fixed roof tank with internal floating deck fitted with primary seal, or fixed roof tank with vapour recovery system.
Above 91 kPa	Pressure vessel

- (ii) The roof legs, slotted pipes and/or dipping well on floating roof tanks (except for doomed floating roof tanks or internal floating roof tanks) shall have sleeves fitted to minimise emissions.
- (iii) Relief valves on pressurised storage should undergo periodic checks for internal leaks. This can be carried out using portable acoustic monitors or if venting to atmosphere with an accessible open end, tested with a hydrocarbon analyser as part of an LDAR programme.
- (iv) Loading/unloading: All installations with a throughput of 5000 m<sup>3</sup> per annum must be fitted with vapour recovery units. All liquid products with a vapour pressure above 14 kPa shall be loaded/unloaded using bottom loading, with the vent pipe connected to a gas balancing line. Vapours expelled during loading operations must be returned to the loading tank if it is of the fixed roof type where it can be stored prior to vapour recovery or destruction. Where vapour balancing and/ or bottom loading is not possible, a recovery system utilising adsorption, absorption and condensation and/or incineration of the remaining VOC, with a collection efficiency of at least 95% shall be fitted.
- (v) The actual temperature in the tank must be used for vapour pressure calculations.

(3) Subcategory 2.3: Industrial fuel oil recyclers

<b>Description:</b>	Installations used to recycle or recover oil from waste oils.		
<b>Application:</b>	Industrial fuel oil recyclers with a throughput > 5000 ton/month.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Carbon monoxide	CO	New	130
		Existing	250
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	3500
Total volatile organic compounds from vapour recovery/destruction units.	N/A	New	40
		Existing	90

- (a) The transitional arrangements contained in 11(2)(a) shall apply.
- (b) The special arrangement contained in 11(2)(b) shall apply.
- (c) Combustion of waste oil shall be subject to emission standards of Category 8: Disposal of hazardous and general waste.

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## 12. Category 3: Carbonization and Coal Gasification

### (1) Subcategory 3.1: Combustion installations

<b>Description:</b>	Combustion installations not used primarily for steam raising or electricity generation.		
<b>Application:</b>	All combustion installations (except test or experimental installations).		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 10% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	700
		Existing	2000
Total volatile organic compounds (from non-coke oven operations)	N/A	New	40
		Existing	90

(a) The following special arrangement shall apply:

- (i) Sulphur-containing compounds to be recovered from gases to be used for combustion with a recovery efficiency of not less than 90% or remaining content of sulphur-containing compounds to be less than 1000 mg/Nm<sup>3</sup> measured as hydrogen sulphide, whichever is strictest.

### (2) Subcategory 3.2: Coke production and coal gasification

<b>Description:</b>	Coke production, coal gasification and by-product recovery from these operations.		
<b>Application:</b>	All installations		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Hydrogen sulphide	H <sub>2</sub> S	New	7 <sup>(i)</sup>
		Existing	10 <sup>(i)</sup>
<b>Notes:</b>	(i) from point source		

(a) The following special arrangements shall apply:

- (i) Charging must be carried out "on the main" with additional draught in the ascension or riser pipes produced by high-pressure water jets in the goosenecks. Even coal feeding must be ensured using screw feeders or rotary valve feeders. Telescopic seals are to be used around the charging holes. Visible emissions are limited to 12 sec per charge
- (ii) For pushing, evacuation from the coke guide and the quench car using stationary ducting and gas cleaning or any other technology yielding the equivalent or better results is required.
- (iii) For quenching, the quench tower must have suitable baffles; quench water must have less than 50 mg/litre suspended solids and no floating oil.
- (iv) A battery and door frame maintenance system approved by the licensing authority must be operated. No more than 4% of doors may show visible leaks; no more than 2.5% of gas off-take pipes may show visible leaks.
- (v) Measurement/ inspection procedures for visible leaks from doors, standpipes and from charging shall be carried out weekly for each battery using method EPA 303 from table 1 and records submitted to the licensing authority on a quarterly basis.
- (b) The licensing authority may set alternative standards and/or control measures for the reduction of hydrogen sulphide emissions.

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*(3) Subcategory 3.3: Tar Production*

<b>Description:</b>	Processes in which tar, creosote or any other product of distillation of tar is distilled or is heated in any manufacturing process.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Total Volatile Organic Compounds	N/A	New	130
		Existing	250

(a) The following transitional and special arrangements shall apply:

- (i) Leak detection and repair (LDAR) program approved by licensing authority to be instituted, within one year after publication date of this Notice.
- (ii) Storage vessels for liquids shall be of the following type:

<b>True vapour pressure of contents at storage temperature</b>	<b>Type of tank or vessel</b>
Up to 14 kPa	Fixed roof tank vented to atmosphere.
Above 14 kPa up to 91 kPa	External floating roof tank with primary and secondary rim seals for tank diameter larger than 20m, or fixed roof tank with internal floating deck fitted with primary seal, or fixed roof tank with vapour recovery system.
Above 91 kPa	Pressure vessel.

- (iii) The roof legs, slotted pipes and/or dipping well on floating roof tanks (except domed floating roof tanks or internal floating roof tanks) shall have sleeves fitted to minimise emissions.
- (iv) Relief valves on pressurised storage should undergo periodic checks for internal leaks. This can be carried out using portable acoustic monitors or if venting to atmosphere with an accessible open end, tested with a hydrocarbon analyser as part of an LDAR programme.
- (v) Loading/unloading (except rail loading and unloading): All liquid products with a vapour pressure above 14 kPa shall be loaded/unloaded using bottom loading, with the vent pipe connected to a gas balancing line. Vapours expelled during loading operations must be returned to the loading tank if it is of the fixed roof type where it can be stored prior to vapour recovery or destruction. Where vapour balancing is not possible, a recovery system utilising adsorption, absorption and condensation and/or incineration of the remaining VOC, with a collection efficiency of at least 95 % shall be fitted.
- (vi) The actual temperature in the tank must be used for vapour pressure calculations.
- (vii) Alternative control measures that can achieve the same or better results may be used.

*(4) Subcategory 3.4 Char, charcoal and carbon black production*

<b>Description:</b>	Char, charcoal and carbon black production (excluding electrode paste production).		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Poly Aromatic Hydrocarbons	PAH	New	0.1
		Existing	0.5

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(5) Subcategory 3.5 Electrode paste production

<b>Description:</b>		Electrode paste production.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	Mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100

13. Category 4: Metallurgical Industry

(1) Subcategory 4.1: Drying

<b>Description:</b>		Drying of mineral solids including ore.	
<b>Application:</b>		Facilities with a production capacity of more than 100 tons/month product.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	1000
		Existing	1000
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	1200

(2) Subcategory 4.2: Combustion installations

<b>Description:</b>		Combustion installations not used for primarily for steam raising and electricity generation (except drying).	
<b>Application:</b>		All combustion installations (except test or experimental).	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	2000

(a) The following special arrangement shall apply –

- (i) Reference oxygen content appropriate to fuel type to be used.

(3) Subcategory 4.3: Primary aluminium production

<b>Description:</b>		Primary aluminium production.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	Soderberg New	No new plant will be authorised
		Soderberg Existing	500
		AP Tech New	50
		AP Tech Existing	100
Total volatile organic compounds	N/A	New	40
		Existing	40

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<b>Description:</b>	Primary aluminium production.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273</b>
Total fluorides measured as Hydrogen fluoride	F as HF	New	0.5
		Existing	1

(4) Subcategory 4.4: Secondary aluminium production

<b>Description:</b>	Secondary aluminium production through the application of heat (excluding metal recovery, covered under 4.21).		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	100
Total fluorides measured as Hydrogen fluoride	F as HF	New	1
		Existing	5
Total volatile organic compounds	N/A	New	40
		Existing	40
Ammonia	NH <sub>3</sub>	New	30
		Existing	100

(5) Subcategory 4.5: Sinter plants

<b>Description:</b>	Sinter plants for agglomeration of fine ores using a heating process, including sinter cooling where applicable.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	1000
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	700
		Existing	1200

(6) Subcategory 4.6: Basic oxygen furnace steel making

<b>Description:</b>	Basic oxygen furnace in steel making industry.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	500

- (a) The following special arrangement shall apply:
- (i) Secondary fume capture installations shall be fitted to all new furnace installations.



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(7) Subcategory 4.7: Electric arc furnace and steel making (primary and secondary)

<b>Description:</b>	Electric arc furnace in steel making industry.		
<b>Application:</b>	All installations.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	30
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	500

(a) The following special arrangement shall apply:

- (i) Secondary fume capture installations shall be fitted to all new furnace installations.

(8) Subcategory 4.8: Blast furnace operations

<b>Description:</b>	Blast furnace operations.		
<b>Application:</b>	All installations.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	30
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	500

(a) The following special arrangement shall apply:

- (i) Secondary fume capture installations shall be fitted to all new furnace installations.

(9) Subcategory 4.9: Ferro-alloy production

<b>Description:</b>	Production of alloys of iron with chromium, manganese, silicon or vanadium, the separation of titanium slag from iron-containing minerals using heat.		
<b>Application:</b>	All installations.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	400
		Existing	750
Particulate matter from primary fume capture system, open and semi-closed furnaces			
Particulate matter	N/A	New	30
		Existing	100
Particulate matter from primary fume capture system, closed furnaces			
Particulate matter	N/A	New	50
		Existing	100
Particulate matter from secondary fume capture system, all furnaces			
Particulate matter	N/A	New	50
		Existing	100

(a) The following special arrangement shall apply:

- (i) Secondary fume capture installations shall be fitted to all new furnace installations

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- (ii) Emission of Cr(VI), Mn and V from primary fume captures systems of ferrochrome, ferromanganese and ferrovanadium furnaces respectively to be measured and reported to licensing authority annually.

(10) Subcategory 4.10: Foundries

<b>Description:</b>		Production and casting of iron and its alloys.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	30
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	400
		Existing	400
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	400
		Existing	1200

(11) Subcategory 4.11: Agglomeration operations

<b>Description:</b>		Production of pellets or briquettes using presses, inclined discs or rotating drums.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	30
		Existing	100
Ammonia	NH <sub>3</sub>	New	30
		Existing	50

(12) Subcategory 4.12: Pre-reduction and direct reduction

<b>Description:</b>		Production of pre-reduced or metallised ore or pellets using gaseous or solid fuels.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide (from natural gas)	SO <sub>2</sub>	New	100
		Existing	500
Sulphur dioxide (from all other fuels)	SO <sub>2</sub>	New	500
		Existing	1700
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New (gas based)	500
		New (all other fuels)	1000
		Existing	2000

(13) Subcategory 4.13: Lead smelting

<b>Description:</b>		The production or processing of lead by the application of heat; the production of electric batteries containing lead.	
<b>Application:</b>		All installations.	
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Particulate matter	N/A	New	30
		Existing	30
Lead	Pb (as fraction of Total Suspended Particles)	New	2
		Existing	2

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*(14) Subcategory 4.14: Production and processing of zinc, nickel and cadmium*

<b>Description:</b>	The production and processing of zinc, nickel or cadmium by the application of heat excluding metal recovery.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/m<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	500
Mercury	Hg	New	0,2
		Existing	1,0
Dioxins	PCDD/PCDF	New	0,1ngTEQ
		Existing	No standard proposed

(a) The following transitional and special arrangement shall apply:

- (i) Facilities processing nickel or cadmium shall measure or estimate, using a method to the satisfaction of the licensing authority, and report the emission of Ni and Cd respectively to the licensing authority annually, commencing within 1 year of publication.

*(15) Subcategory 4.15: Processing of arsenic, antimony, beryllium chromium and silicon*

<b>Description:</b>	The metallurgical production and processing of arsenic, antimony, beryllium chromium and silicon and their compounds by the application of heat.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/m<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	20
		Existing	30

*(16) Subcategory 4.16: Smelting and converting of sulphide ores*

<b>Description:</b>	Process in which sulphide ores are smelted, roasted calcined or converted.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	350
		Existing	2000
Sulphur dioxide (feed SO <sub>2</sub> <5% SO <sub>2</sub> )	SO <sub>2</sub>	New	1200
		Existing	3500
Sulphur dioxide (feed SO <sub>2</sub> >5% SO <sub>2</sub> )	SO <sub>2</sub>	New	1200
		Existing	2500

(a) The following special arrangements shall apply:

- (i) All facilities must install apparatus for the treatment of the sulphur content of the off-gases.

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*(17) Subcategory 4.17: Precious and base metal production and refining*

<b>Description:</b>	The production or processing of precious and associated base metals.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Chlorine	Cl <sub>2</sub>	New	50
		Existing	50
Sulphur dioxide	SO <sub>2</sub>	New	400
		Existing	400
Hydrogen chloride	HCl	New	30
		Existing	30
Hydrogen fluoride	HF	New	30
		Existing	30
Ammonia	NH <sub>3</sub>	New	100
		Existing	100
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	300
		Existing	500

- (a) The following transitional and special arrangement shall apply:
- (i) Plants processing nickel and its compounds shall report the emissions thereof to the licensing authority annually, commencing within 1 year of publication.

*(18) Subcategory 4.18: Vanadium ore processing*

<b>Description:</b>	The processing of vanadium-bearing ore or slag for the production of vanadium oxides by the application of heat.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	50
Sulphur dioxide	SO <sub>2</sub>	New	1200
		Existing	3500
Ammonia	NH <sub>3</sub>	New	30
		Existing	100
Vanadium	V	New & Existing	1 x 10 <sup>-6</sup>

- (a) The following transitional and special arrangements shall apply:
- (i) Plants processing vanadium ore or slag for the production of vanadium oxides shall report the emissions of vanadium and its compounds and ammonia to the licensing authority annually, commencing within 1 year of publication.

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*(19) Subcategory 4.19: Production and casting of bronze and brass, and casting copper*

<b>Description:</b>	The production or and casting of bronze and brass and the casting of copper.		
<b>Application:</b>	All installations producing more than 10 tons per day of product in aggregate.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	500
		Existing	500
Oxides of Nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	1000
		Existing	1200

*(20) Subcategory 4.20: Slag processes*

<b>Description:</b>	The processing or recovery of metallurgical slag by the application of heat.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	1500
		Existing	2500
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	350
		Existing	2000

(a) The following transitional and special arrangements shall apply:

- (i) Facilities processing slag by the application of heat for the recovery of chromium or manganese content shall report the emissions of Cr(III) and Cr(VI) or Mn and its compounds respectively to the licensing authority annually, commencing within one year of the publication of the notice.

*(21) Subcategory 4.21: Metal recovery*

<b>Description:</b>	The recovery of non-ferrous metal from any form of scrap material containing combustible components by the application of heat.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	10
		Existing	25
Carbon monoxide	CO	New	50
		Existing	75
Sulphur dioxide	SO <sub>2</sub>	New	50
		Existing	50
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	200
		Existing	200
Hydrogen chloride	HCl	New	10
		Existing	10
Hydrogen fluoride	HF	New	1
		Existing	1
Sum of Lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, vanadium	Pb+ As+ Sb+ Cr+ Co+ Cu + Mn+ Ni+ V	New	0.5
		Existing	0.5
Mercury	Hg	New	0.05
		Existing	0.05
Cadmium Thallium	Cd+Tl	New	0.05
		Existing	0.05

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<b>Description:</b>	The recovery of non-ferrous metal from any form of scrap material containing combustible components by the application of heat.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant</b>	<b>mg/Nm<sup>3</sup> under normal conditions of</b>
Total organic compounds	TOC	New	10
		Existing	10
Ammonia	NH <sub>3</sub>	New	10
		Existing	10
			<b>ng I-TEQ /Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
Dioxins and furans	PCDD/PCDF	New	0.1
		Existing	0.1

*(22) Subcategory 4.22: Hot dip galvanizing*

<b>Description:</b>	The coating of steel articles with zinc using molten zinc, including the pickling and/or fluxing of articles before coating.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	10
		Existing	15
Hydrogen Chloride	HCl	New	30
		Existing	30

(a) The following special arrangements shall apply:

- (i) Acid baths shall both be fitted with air extraction systems to the satisfaction of the licensing authority.
- (ii) Measurements of emissions to be carried out in the exhaust ducting of the extraction system.

*(23) Subcategory 4.23: Metal Spray*

<b>Description:</b>	The coating of metals with zinc using molten zinc.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	50

**14. Category 5: Mineral Processing, Storage and Handling**

*(1) Subcategory 5.1: Storage and handling of ore and coal*

<b>Description:</b>	Storage and handling of ore and coal not situated on the premises of a mine or works as defined in the Mines Health and Safety Act 29/1996.		
<b>Application:</b>	Locations designed to hold more than 100 000 tons.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Dustfall	N/A	New	a
		Existing	a
a: three month running average not to exceed limit value for adjacent land use according to dust fallout standards promulgated in terms of section 32 of the NEM: AQA, 2004 (Act No. 39 of 2004), in eight principal wind directions			

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(2) Subcategory 5.2: Clamp kilns for brick production

<b>Description:</b>	The production of bricks using clamp kilns.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	
<b>Common name</b>	<b>Chemical symbol</b>		
Dust fall	N/A	New	a
		Existing	a
Sulphur dioxide	SO <sub>2</sub>	New	b
		Existing	b
<p><sup>a</sup>: three month running average not to exceed limit value for adjacent land use according to dust fallout standards promulgated in terms of section 32 of the NEM: AQA, 2004 (Act No. 39 of 2004), in eight principal wind directions.</p> <p><sup>b</sup>: Twelve month running average not to exceed limit value as per GN 1210 of 24 December 2009. Passive diffusive measurement approved by the licensing authority carried out monthly.</p>			

(3) Subcategory 5.3: Cement production (using conventional fuels and raw materials)

<b>Description:</b>	The production and cooling of Portland cement clinker; grinding and blending of clinker to produce finished cement; and packaging of finished cement.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter (Kiln)	N/A	New	50
		Existing	100
Particulate matter (Cooler ESP)	N/A	New	100
		Existing	150
Particulate matter (Cooler BF)	N/A	New	50
		Existing	50
Particulate matter (Clinker grinding)	N/A	New	30
		Existing	50
Sulphur dioxide	SO <sub>2</sub>	New	250
		Existing	250
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	1200
		Existing	2000

(a) The following special arrangements shall apply:

- (i) Emissions from cooling, grinding and fugitive dust capture processes are not subject to the oxygen content reference condition.

(4) Subcategory 5.4: Cement production (using alternative fuels and/or resources)

<b>Description:</b>	The production and cooling of Portland cement clinker; grinding and blending of clinker to produce finished cement where alternative fuels and/or resources are used.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	80
Sulphur dioxide	SO <sub>2</sub>	New	50
		Existing	250
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	800
		Existing	1200
Total organic compounds,	N/A	New	10
		Existing	10
Hydrogen chloride	HCl	New	10
		Existing	10
Hydrogen fluoride	HF	New	1

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<b>Description:</b>	The production and cooling of Portland cement clinker; grinding and blending of clinker to produce finished cement where alternative fuels and/or resources are used.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of</b>
		Existing	1
Cadmium + Thallium	Cd + Tl	New	0.05
		Existing	0.05
Mercury	Hg	New	0.05
		Existing	0.05
Sum of arsenic, antimony, lead, chromium, cobalt, copper, manganese, vanadium and nickel	As; Sb; Pb; Cr; Co; Cu; Mn; V & Ni	New	0.5
		Existing	0.5
			<b>ng I-TEQ /Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
Dioxins and furans	PCDD/PCDF	New	0.1
		Existing	0.1

- (a) The following special arrangements shall apply:
- (i) Compliance timeframes for PM and NO<sub>x</sub> shall be in accordance with the National Policy on Thermal Treatment of General and Hazardous Waste (GG No.32439, Notice No.777 of 24 July 2009).
  - (ii) Compliance with the requirements specified under Schedule 4; Section 11.4 of the National Policy on Thermal Treatment of General and Hazardous Waste (GG No.32439, Notice No.777 of 24 July 2009).

*(5) Subcategory 5.5: Lime production*

<b>Description:</b>	Burning of lime, magnesite, dolomite and calcium sulphate.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	50
Sulphur dioxide	SO <sub>2</sub>	New	400
		Existing	400
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	500

*(6) Subcategory 5.6: Glass and mineral wool production*

<b>Description:</b>	The production of glass containers, flat glass, glass fibre and mineral wool.		
<b>Application:</b>	All installations producing 100 ton per annum or more.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 11% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	140
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	1500
		Existing	2000
Sulphur dioxide (Gas fired furnace)	SO <sub>2</sub>	New	800
		Existing	800
Sulphur dioxide (Oil fired furnace)	SO <sub>2</sub>	New	1500
		Existing	1500



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*(7) Subcategory 5.7: Ceramic production*

<b>Description:</b>	The production of tiles, bricks, refractory bricks, stoneware or porcelain ware by firing, excluding clamp kilns.		
<b>Application:</b>	All installations producing 100 ton per annum or more.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	150
Sulphur dioxide	SO <sub>2</sub>	New	400
		Existing	1000
Total fluorides measured as hydrogen fluoride	HF	New	50
		Existing	50

*(8) Subcategory 5.8: Macadam preparation*

<b>Description:</b>	The production mixtures of aggregate and tar or bitumen to produce road surfacing in permanent facilities and mobile plants.		
<b>Application:</b>	All plants.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	120
Sulphur dioxide	SO <sub>2</sub>	New	1000
		Existing	1000
Total volatile organic compounds from vapour recovery/ destruction units (Thermal treatment).	N/A	New	150
		Existing	150

*(9) Subcategory 5.9: Alkali processes*

<b>Description:</b>	Primary manufacturing of potassium or sodium sulphate or the treatment of ores by chloride salts whereby hydrogen chloride gas is evolved.		
<b>Application:</b>	All installations producing 100 ton per annum or more.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	30
		Existing	100
Hydrogen chloride	HCl	New	30
		Existing	30

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**15. Category 6: Organic Chemicals Industry**

*(1) Subcategory 6.1: Organic chemical manufacturing*

<b>Description:</b>	The manufacture or use in manufacture of hydrocarbons not specified elsewhere including acetylene, acetic, maleic or phthalic anhydride or their acids, carbon disulphide, pyridine, formaldehyde, acetaldehyde, acrolein and its derivatives, acrylonitrile, amines and synthetic rubber. The manufacture of organometallic compounds, organic dyes and pigments, surface-active agents, the polymerisation or co-polymerisation of any unsaturated hydrocarbons, substituted hydrocarbon (including vinyl chloride), the manufacture, recovery or purification of acrylic acid or any ester of acrylic acid, the use of toluene di-isocyanate or other di-isocyanate of comparable volatility; or recovery of pyridine.		
<b>Application:</b>	All installations producing or using more than 100 tons per annum, and storage tanks with cumulative tankage capacity larger than 500 cubic meters, of any or a combination of the compounds listed above.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Total volatile organic compounds (thermal)	N/A	New	150
		Existing	150
Total volatile organic compounds (non thermal)	N/A	New	40
		Existing	40
Sulphur trioxide (from sulphonation processes)	SO <sub>3</sub>	New	30
		Existing	100
Acrylonitrile (from processes producing and/or using acrylonitrile).	CH <sub>2</sub> CHCN	New	5
		Existing	5
Methylamines	CH <sub>5</sub> N	New	10
		Existing	10

(a) The following transitional and special arrangements shall apply:

- (i) Leak detection and repair (LDAR) program approved by licensing authority to be instituted, within one year after publication date of this Notice.
- (ii) Storage vessels for liquids shall be of the following type:

True vapour pressure of contents at storage temperature	Type of tank or vessel
Up to 14 kPa	Fixed roof tank vented to atmosphere.
Above 14 kPa up to 91 kPa	External floating roof tank with primary and secondary rim seals for tank diameter larger than 20m, or fixed roof tank with internal floating deck fitted with primary seal, or fixed roof tank with vapour recovery system.
Above 91 kPa	Pressure vessel.

- (iii) The roof legs, slotted pipes and/or dipping well on floating roof tanks (except domed floating roof tanks or internal floating roof tanks) shall have sleeves fitted to minimise emissions.
- (iv) Relief valves on pressurised storage should undergo periodic checks for internal leaks. This can be carried out using portable acoustic monitors or if venting to atmosphere with an accessible open end, tested with a hydrocarbon analyser as part of an LDAR programme.
- (v) Loading/unloading (except rail loading and unloading): All liquid products with a vapour pressure above 14 kPa shall be loaded/unloaded using bottom loading, with the vent pipe connected to a gas balancing line. Vapours expelled during loading operations must be returned to the loading tank if it is of the fixed roof type where it

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can be stored prior to vapour recovery or destruction. Where vapour balancing is not possible, a recovery system utilising adsorption, absorption and condensation and/or incineration of the remaining VOC, with a collection efficiency of at least 95 % shall be fitted.

- (vi) The actual temperature in the tank must be used for vapour pressure calculations.
- (vii) Alternative control measures that can achieve the same or better results may be used.

## 16. Category 7: Inorganic Chemicals Industry

### (1) Subcategory 7.1: Primary production and use in manufacturing of ammonia, fluorine, chlorine, and Hydrogen Cyanide

<b>Description:</b>	Production and use in manufacturing of ammonia, fluorine, and chlorine gas.		
<b>Application:</b>	All installations.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 6% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Hydrogen fluoride	HF	New	5
		Existing	30
Chlorine	Cl <sub>2</sub>	New	50
		Existing	50
Ammonia	NH <sub>3</sub>	New	30
		Existing	100
Hydrogen Cyanide	HCN	New	0.5
		Existing	2

### (2) Subcategory 7.2: Primary production of acids

<b>Description:</b>	The primary production of hydrofluoric, hydrochloric, nitric and sulphuric acid (including oleum) in concentration exceeding 10%; also processes in which oxides of sulphur are emitted through the manufacture of acid sulphites of alkalis or alkaline earths or through the production of liquid sulphur dioxide or sulphurous acid and secondary production of hydrochloric acid through regeneration		
<b>Application:</b>	All installations with the exception of those producing sulphuric acid as part of the recovery of metals from ore.		
Substance or mixture of substances		Plant status	mg/Nm <sup>3</sup> under normal conditions of 6% O <sub>2</sub> , 273 Kelvin and 101.3 kPa.
Common name	Chemical symbol		
Primary production			
Total fluoride measured as Hydrogen Fluoride	F as HF	New	5
		Existing	30
Hydrogen chloride	HCl	New	15
		Existing	25
Sulphur dioxide	SO <sub>2</sub>	New	350
		Existing	2800
Sulphuric acid mist and sulphur trioxide expressed as SO <sub>3</sub>	SO <sub>3</sub>	New	25
		Existing	100
Oxides of nitrogen expressed as NO <sub>2</sub>	NO <sub>x</sub>	New	350
		Existing	2000
Secondary production of hydrochloric acid*			
Hydrogen chloride	HCl	New	30
		Existing	100

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*(3) Subcategory 7.3: Primary production of chemical fertilizer*

<b>Description:</b>	The production of superphosphates, ammonium nitrate, ammonium phosphates and ammonium sulphate and their processing into solid fertiliser mixtures (NPK mixtures).		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Total fluoride measured as Hydrogen Fluoride	F as HF	New	5
		Existing	30
Ammonia	NH <sub>3</sub>	New	50
		Existing	100

*(4) Subcategory 7.4: Manufacturing activity involving the production, use in manufacturing or recovery of antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, mercury, selenium, by the application of heat.*

<b>Description:</b>	Manufacturing activity involving the production, use or recovery of antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, mercury, selenium, thallium and their salts not covered elsewhere by the application of heat, excluding their use as catalyst.		
<b>Application:</b>	All installations producing more than 1 ton per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	10
		Existing	25

(a) The following special arrangement shall apply:

- (i) Operators shall estimate the emissions of the metals using a method set out in Section 2. Where the estimated emissions exceed 10 tons per annum for any one of the metals, or 25 tons per annum for a combination of the metals, an air quality impact assessment for the emissions shall be submitted to the licensing authority annually, commencing within one year of the publication of the notice.

*(5) Subcategory 7.5: Production of calcium carbide*

<b>Description:</b>	Production of calcium carbide.		
<b>Application:</b>	All installations producing more than 10 tons per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	25
		Existing	100

*(6) Subcategory 7.6: Production of phosphorus and phosphate salts not mentioned elsewhere*

<b>Description:</b>	Production of phosphorus and phosphate salts.		
<b>Application:</b>	All installations producing more than 10 ton per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	25
		Existing	50

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**17. Category 8: Disposal of hazardous and general waste**

<b>Description:</b>	Facilities where general and hazardous waste including health care waste, crematoria, veterinary waste, used oil or sludge from the treatment of used oil are incinerated.		
<b>Application:</b>	Facilities with an incinerator capacity of 10 kg of waste processed per hour or larger capacity.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	10
		Existing	25
Carbon monoxide	CO	New	50
		Existing	75
Sulphur dioxide	SO <sub>2</sub>	New	50
		Existing	50
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	200
		Existing	200
Hydrogen chloride	HCl	New	10
		Existing	10
Hydrogen fluoride	HF	New	1
		Existing	1
Sum of Lead, arsenic, antimony, chromium, cobalt, copper, manganese, nickel, vanadium	Pb+ As+ Sb+ Cr+ Co+ Cu + Mn+ Ni+ V	New	0.5
		Existing	0.5
Mercury	Hg	New	0.05
		Existing	0.05
Cadmium Thallium	Cd+Tl	New	0.05
		Existing	0.05
Total organic compounds	TOC	New	10
		Existing	10
Ammonia	NH <sub>3</sub>	New	10
		Existing	10
			<b>ng I-TEQ /Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
Dioxins and furans	PCDD/PCDF	New	0.1
		Existing	0.1

(a) The following special arrangements shall apply:

- (i) Compliance with the requirements specified under Schedule 4, Section 11.4 of the National Policy on Thermal Treatment of General and Hazardous Waste (GG No.32439, Notice No.777 of 24 July 2009).
- (ii) Compliance time frames for health care risk waste incineration will be as specified in Section 5 unless specific compliance time frames for health care risk waste incineration have been set under health care risk waste regulations, in which case, the specific compliance time frames for health care risk waste incineration set under health care risk waste regulations shall apply.

**18. Category 9: Pulp and Paper Manufacturing Activities, including By-Products Recovery**

*(1) Subcategory 9.1: Lime recovery kiln*

<b>Description:</b>	The recovery of lime from the thermal treatment of paper-making waste.		
<b>Application:</b>	All installations producing more than 1 ton per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Total reduced sulphur	H <sub>2</sub> S	New	10

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<b>Description:</b>	The recovery of lime from the thermal treatment of paper-making waste.		
<b>Application:</b>	All installations producing more than 1 ton per month.		
<b>Substance or mixture of substances</b>		<b>Plant</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 6% O<sub>2</sub>, 273</b>
compounds measured as H <sub>2</sub> S		Existing	10
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	600
		Existing	2000

*(2) Subcategory 9.2: Alkali waste chemical recovery furnaces*

<b>Description:</b>	The recovery of alkali from the thermal treatment of paper-making waste.		
<b>Application:</b>	All installations producing more than 1 ton per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	50
		Existing	100
Hydrogen sulphide	H <sub>2</sub> S	New	15
		Existing	15
Sulphur dioxide	SO <sub>2</sub>	New	30
		Existing	300
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	300
		Existing	300

*(3) Subcategory 9.3: Copeland alkali waste chemical recovery process*

<b>Description:</b>	The recovery of alkali from the thermal treatment of paper-making waste using a Copeland process		
<b>Application:</b>	All installations producing more than 1 ton per month		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	No plant of this type will be authorised in the future
		Existing	100
Sulphur dioxide	SO <sub>2</sub>	New	No plant of this type will be authorised in the future
		Existing	800

*(4) Subcategory 9.4: Chlorine dioxide plant*

<b>Description:</b>	Production and use of chlorine dioxide for paper production.		
<b>Application:</b>	All installations.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Hydrogen chloride	HCl	New	15
		Existing	30

*(5) Subcategory 9.6: Wood drying and the production of manufactured wood products*

<b>Description:</b>	The drying of wood by an external source of heat; the manufacture of laminated and compressed wood products.		
<b>Application:</b>	All installations producing more than 10 tons per month.		
<b>Substance or mixture of substances</b>		<b>Plant status</b>	<b>mg/Nm<sup>3</sup> under normal conditions of 10% O<sub>2</sub>, 273 Kelvin and 101.3 kPa.</b>
<b>Common name</b>	<b>Chemical symbol</b>		
Particulate matter	N/A	New	150
		Existing	200
Oxides of nitrogen	NO <sub>x</sub> expressed as NO <sub>2</sub>	New	500
		Existing	700

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**19. Category 10: Animal matter processing**

<b>Description:</b>	Processes for the rendering cooking, drying, dehydrating, digesting, evaporating or protein concentrating of any animal matter not intended for human consumption.
<b>Application:</b>	All installations handling more than 1 ton of raw materials per day.

- (a) The following special arrangement shall apply:
- (i) Best practice measures intended to minimised or avoid offensive odours must be implemented by all installations. These measures must be documented to the satisfaction of the Licensing Authority.

**SCHEDULE A - METHODS FOR SAMPLING AND ANALYSIS**

The following referenced documents are indispensable for the application of the Notice. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained from Standards South Africa.

- (1) ISO Standards
- (a) ISO 7934:1989 Stationary source emissions – Determination of the mass concentration of sulfur dioxide - Hydrogen peroxide/barium perchlorate/Thorin method.
- (b) ISO 7934:1989/Amd 1:1998
- (c) ISO 7935: Stationary source emissions – Determination of the mass concentration of sulfur dioxide – Performance characteristics of automated measuring method.
- (d) ISO 9096: Stationary source emissions – Manual Determination of mass concentration of particulate matter.
- (e) ISO 10155: Stationary source emissions – Automated monitoring of mass concentrations of particles – Performance characteristics, test methods and specifications
- (f) ISO 10396: Stationary source emissions – Sampling for the automated determination of gas emissions concentrations for permanently-installed monitoring systems
- (g) ISO 10397: Stationary source emissions – Determination of asbestos plant emissions method by fibre counting measurement
- (h) ISO 10780: Stationary source emissions – Measurement of velocity volume flow rate of gas steams in ducts.
- (i) ISO 10849: Stationary source emissions – Determination of the mass concentration of nitrogen oxides – Performance characteristics of automated measuring systems
- (j) ISO 11338-1: Stationary source emissions – Determination of gas and particle-phase polycyclic aromatic hydrocarbons Part 1: Sampling.
- (k) ISO 11338-2: Stationary source emissions – Determination of gas and particle-phase polycyclic aromatic hydrocarbons Part 2: Sample preparation, clean-up and determination.
- (l) ISO 11564: Stationary source emissions – Determination of the mass concentration of nitrogen oxides -Naphthylethylenediamine photometric method.

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- (m) ISO 11632: Stationary source emissions – Determination of mass concentration of sulphur dioxide – Iron chromatography method.
  - (n) ISO 12039: Stationary source emissions – Determination of carbon monoxide, carbon dioxide and oxygen – Performance characteristics and calibration of automated measuring systems.
  - (o) ISO 12141: Stationary source emissions – Determination of mass concentration of particulate matter (dust) at low concentrations- Manual gravimetric method.
  - (p) ISO 14164: Stationary source emissions – Determination of the volume flow-rate of gas streams in ducts - Automated method.
  - (q) ISO 15713: Stationary source emissions – Sampling and determination of gaseous fluoride content.
- (2) EPA methods
- (a) Method 1 – Traverse Points
  - (b) Method 1A – Small Ducts
  - (c) Method 2 – Velocity - S-type Pitot
  - (d) Method 2A – Volume Meters
  - (e) Method 2B – Exhaust Volume Flow Rate
  - (f) Method 2C – Standard Pitot
  - (g) Method 2D – Rate Meters
  - (h) Method 2F – Flow Rate Measurement with 3-D Probe
  - (i) Method 2G – Flow Rate Measurement with 2-D Probe
  - (j) Method 2H – Flow Rate Measurement with Velocity Decay Near Stack Walls
  - (k) Memo – New Test Procedures of Stack Gas Flow Rate in Place of Method 2
  - (l) Method 3 – Molecular Weight
  - (m) Method 3A – CO<sub>2</sub>, O<sub>2</sub> by instrumental methods
  - (n) Method 3B – CO<sub>2</sub>, O<sub>2</sub> by Orsat apparatus
  - (o) Method 3C – CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>, O<sub>2</sub> by determined by thermal conductivity
  - (p) Method 4 – Moisture Content
  - (q) Method 5 – Particulate Matter (PM)
  - (r) Method 5D – PM Baghouses (Particulate Matter)
  - (s) Method 5E – PM Fiberglass Plants (Particulate Matter)
  - (t) Method 5F – PM Fluid Catalytic Cracking Unit
  - (u) Method 5I – Determination of Low Level Particulate Matter Emissions
  - (v) Method 6 – Sulphur Dioxide (SO<sub>2</sub>)
  - (w) Method 6A – SO<sub>2</sub>, CO<sub>2</sub>
  - (x) Method 6B – SO<sub>2</sub>, CO<sub>2</sub> - Long Term Integrated



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- (y) Method 6C – SO<sub>2</sub> - Instrumental
- (z) Method 6C – Figures SO<sub>2</sub>
- (aa) Method 7 – Nitrogen Oxide (NO<sub>x</sub>)
- (bb) Method 7A – NO<sub>x</sub> - Ion Chromatographic Method
- (cc) Method 7B – NO<sub>x</sub> - Ultraviolet Spectrophotometry
- (dd) Method 7C – NO<sub>x</sub> - Colorimetric Method
- (ee) Method 7D – NO<sub>x</sub> - Ion Chromatographic
- (ff) Method 7E – NO<sub>x</sub> - Instrumental
- (gg) Method 8 – Sulfuric Acid Mist
- (hh) Method 9 – Visual Opacity
- (ii) Method 10 – Carbon Monoxide-NDIR
- (jj) Method 10A – CO for Certifying CEMS
- (kk) Method 10B – CO from Stationary Sources
- (ll) Method 11 – H<sub>2</sub>S Content of Fuel
- (mm) Method 12 – Inorganic Lead
- (nn) Method 13A – Total Fluoride (SPADNS Zirconium Lake)
- (oo) Method 13B – Total Fluoride (Specific Ion Electrode)
- (pp) Method 14 – Fluoride for Primary Aluminium Plants
- (qq) Method 14A – Total Fluoride Emissions from Selected Sources at Primary Aluminium Plants
- (rr) Method 15 – Hydrogen Sulfide, Carbonyl Sulfide, and Carbon Disulfide
- (ss) Method 15A – Total Reduced Sulfur (TRS Alt.)
- (tt) Method 16 – Sulfur (Semicontinuous Determination)
- (uu) Method 16A – Total Reduced Sulfur (Impinger)
- (vv) Method 16B – Total Reduced Sulfur (GC Analysis)
- (ww) Method 17 – In-Stack Particulate (PM)
- (xx) Method 18 – VOC by GC
- (yy) Method 19 – SO<sub>2</sub> Removal & PM, SO<sub>2</sub>, NO<sub>x</sub> Rates from Electric Utility Steam Generators
- (zz) Method 20 – NO<sub>x</sub> from Stationary Gas Turbines
- (aaa) Method 21 – VOC Leaks
- (bbb) Method 22 – Fugitive Opacity
- (ccc) Method 23 – Dioxin and Furan (02/91 FR Copy).
- (ddd) Method 25 – Gaseous Nonmethane Organic Emissions
- (eee) Method 25A – Gaseous Organic Concentration (Flame Ionization)

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- (fff) Method 25B – Gaseous Organic Concentration (Infrared Analyzer)
  - (ggg) Method 26 – Hydrogen Chloride, Halides, Halogens
  - (hhh) Method 26A – Hydrogen Halide & Halogen-Isokinetic
  - (iii) Method 28A – Air to Fuel Ratio, Burn Rate - Wood-fired Appliances
  - (jjj) Method 29 – Metals Emissions from Stationary Sources
  - (kkk) Method 101 – Mercury from Chlor-Alkali Plants (Air)
  - (lll) Method 101A – Mercury from Sewage Sludge Incinerators
  - (mmm) Method 102 – Mercury from Chlor-Alkali Plants (Hydrogen Streams)
  - (nnn) Method 103 – Beryllium Screening Method
  - (ooo) Method 104 – Beryllium Emissions Determination
  - (ppp) Method 106 – Determination of Vinyl Chloride
  - (qqq) Method 107A – Vinyl Chloride content of Solvents
  - (rrr) Method 108 – Particulate & Gaseous Arsenic emissions
  - (sss) Method 108B – Arsenic
  - (ttt) Method 108C – Arsenic
  - (uuu) Methods 203A, B, and C – Opacity Determination for Time-Averaged Regulations
  - (vvv) Method 303 – By-product Coke Oven Batteries
- (3) British standards
- (a) BS 3405:1983 Method for measurement of particulate emission including grit and dust (simplified method).
  - (b) BS EN 14181:2004 Stationary source emissions. Quality assurance of automated measuring systems.
  - (c) BS EN 15259: Air quality. Measurement of stationary source emissions. Measurement strategy, measurement planning, reporting and design of measurement sites.
  - (d) BS EN 15267-1: Air quality. Certification of automated measuring systems. General principles.
  - (e) BS EN 15267-2: Air quality. Certification of automated measuring systems. Initial assessment of the AMS manufacturer's quality management system and post certification surveillance for the manufacturing process.
  - (f) BS EN 15267-3: Air quality. Certification of automated measuring systems. Performance criteria and test procedures for automated measuring systems for monitoring emissions from stationary sources.