

Module 5 EQA 1974

Air Quality under EQA 1974

Related Regulations on Air Quality &
Environmental Quality (Clean Air)
Regulations 2014

OUTLINE OF PRESENTATION

1. Sources That Subjected to Clean Air Regulations
2. Introduction Clean Air Regulation, 2014
3. Emission Standards & Ambient Air Quality Guideline
4. Written Notification Forms
5. Other Related Regulations on Air Quality

Objective

At the end of this module, you should be able

- briefly describe the overall provision in the Environmental Quality (Clean Air) Regulations 2014
- Recognize the sources that subjected to written notification
- Recognize various emission standards
- Explain the written approval application procedure and approval conditions.
- Recognize other related regulations, guidelines and Malaysian Standards on air quality

1. Sources subjected to Clean Air Regulations

- What needs written approval/notification?
 - chimney, vents, opening, etc through which air pollutants will be discharged.
 - fuel burning equipment
 - incinerators
 - generators
- The application for the above would include air pollution control equipment

- The approval condition (KB) may include:
 - chimney height; control equipment specifications, operating conditions, maintenance and record keeping, etc.

Definition of chimney

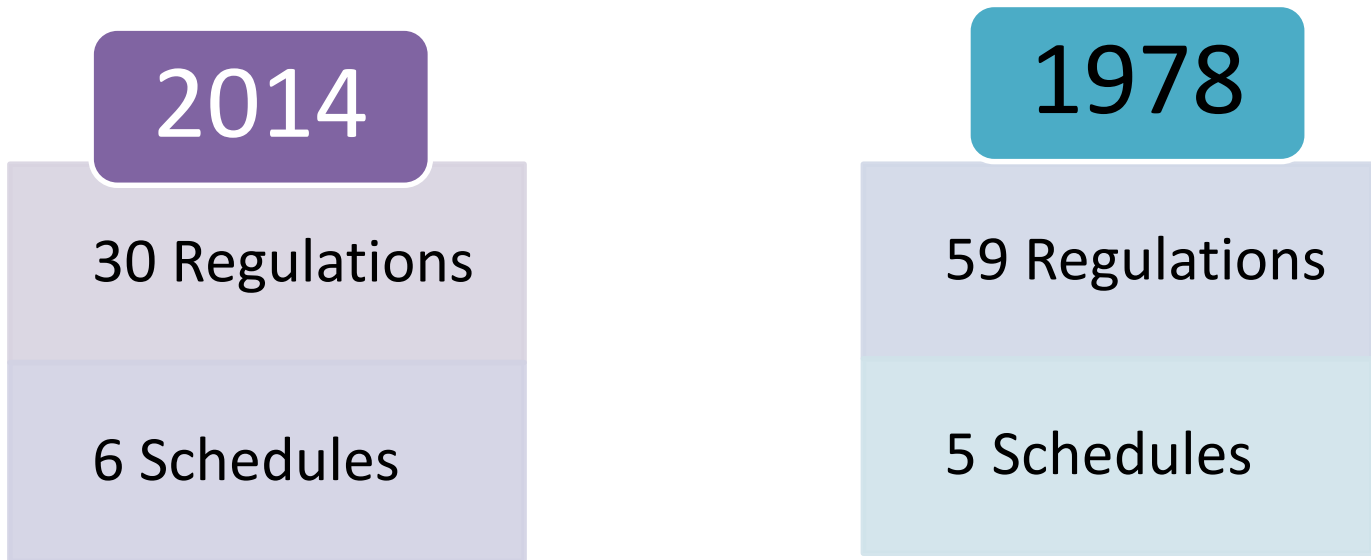
- “Chimney” includes any structure, opening, vent, flue, conduit, outlet or any structure constructed or arranged from or through which air pollutants may emit, and any reference to a chimney which serves the whole or a part of the facilities though structurally separate from such facilities or building thereon

Definition of fuel burning equipment

- “fuel burning equipment” means any furnace, boiler, fireplace, oven, retort, internal combustion engine, vessel, or any other apparatus, device, mechanism, stack, chimney or structure used in connection with the burning of any combustible material;

CAR 2014 vs CAR 1978

Number of Regulations & Schedules



COMPLIANCE SCHEDULE SUBJECT TO ACTIVITY

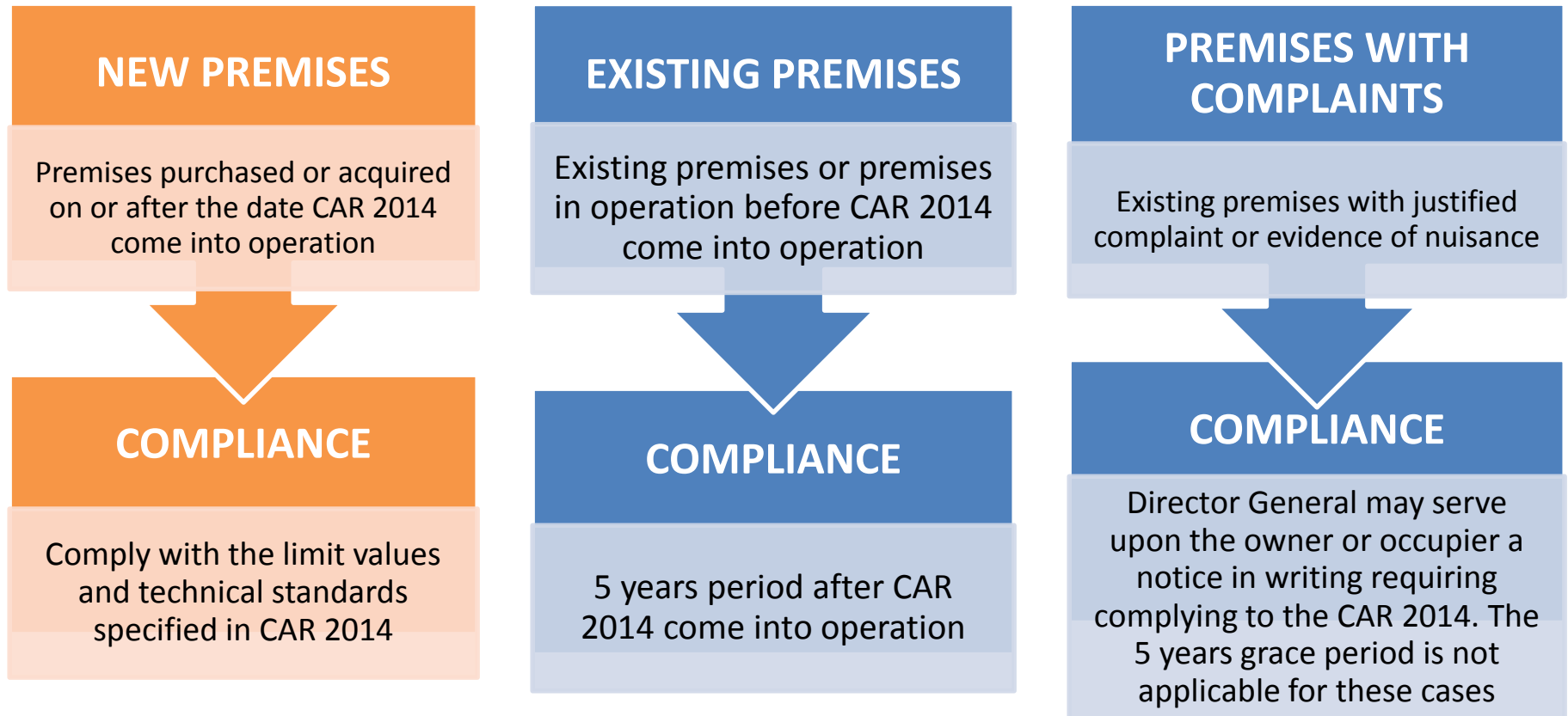
ACTIVITY	COMPLIANCE SUBJECT TO SCHEDULE
All premises - General standard emission	SECOND SCHEDULE
Specific standard for specific industry - 11 specific industries (Table A – K)	THIRD SCHEDULE
Toxicity equivalents factor (TEFs) for dioxin and furan	FOURTH SCHEDULE
Emission Standards For Hazardous Substances - 6 Categories (Category 1 – 6)	FIFTH SCHEDULE
List of Undesirable Occurrence	SIXTH SCHEDULE

FORMS AND SUPPORTING DOCUMENTS

NO	DOCUMENT / FORMS	RELATED REGULATIONS
1	Form: Written Notification of Air Emission Sources	5(2)
2	Guidance Document :Best Available Techniques Economically Achievable (BAT)	6
3	Guidance Document : Design and Operation of Air Pollution Control System	7(1)
4	Form : Written Declaration On Design And Construction Of Air Pollution Control System	7(4)
5	Document : List of Hazardous Substances	15(2)
6	Guidance Document : Performance Monitoring of Air Pollution Control System	9(a)
7	Guidance Document : Installation and Maintenance of Continuous Emission Monitoring System (CEMS)	17 (2)
8	Form: Emission Declaration Of Air Emission Sources	19(1)
9	Guidance Document : Fugitive Emission Control	Second Schedule
10	Guidance Document : Leak Detection and Repair	3-E

REGULATION 4(1)

OBLIGATION TO COMPLY



REGULATION 5

OBLIGATION TO NOTIFY

AS/PUB/N-CHIMNEY

PEMBERITAHUAN BERTULIS PEMASANGAN EKZOS/ SISTEM PENGUDARAAN
[Peraturan 5(2)]
WRITTEN NOTIFICATION ON INSTALLATION OF EXHAUST/ VENT
[Regulation 5(2)]

Sila tanda (✓) pada kotak yang berkaitan
 Please tick (✓) in appropriate box

(a) Pembinaan baru
 New construction ☐


(b) Menaik taraf sistem sedia ada
 Upgrade of existing system ☐

Perhatian/Attention.

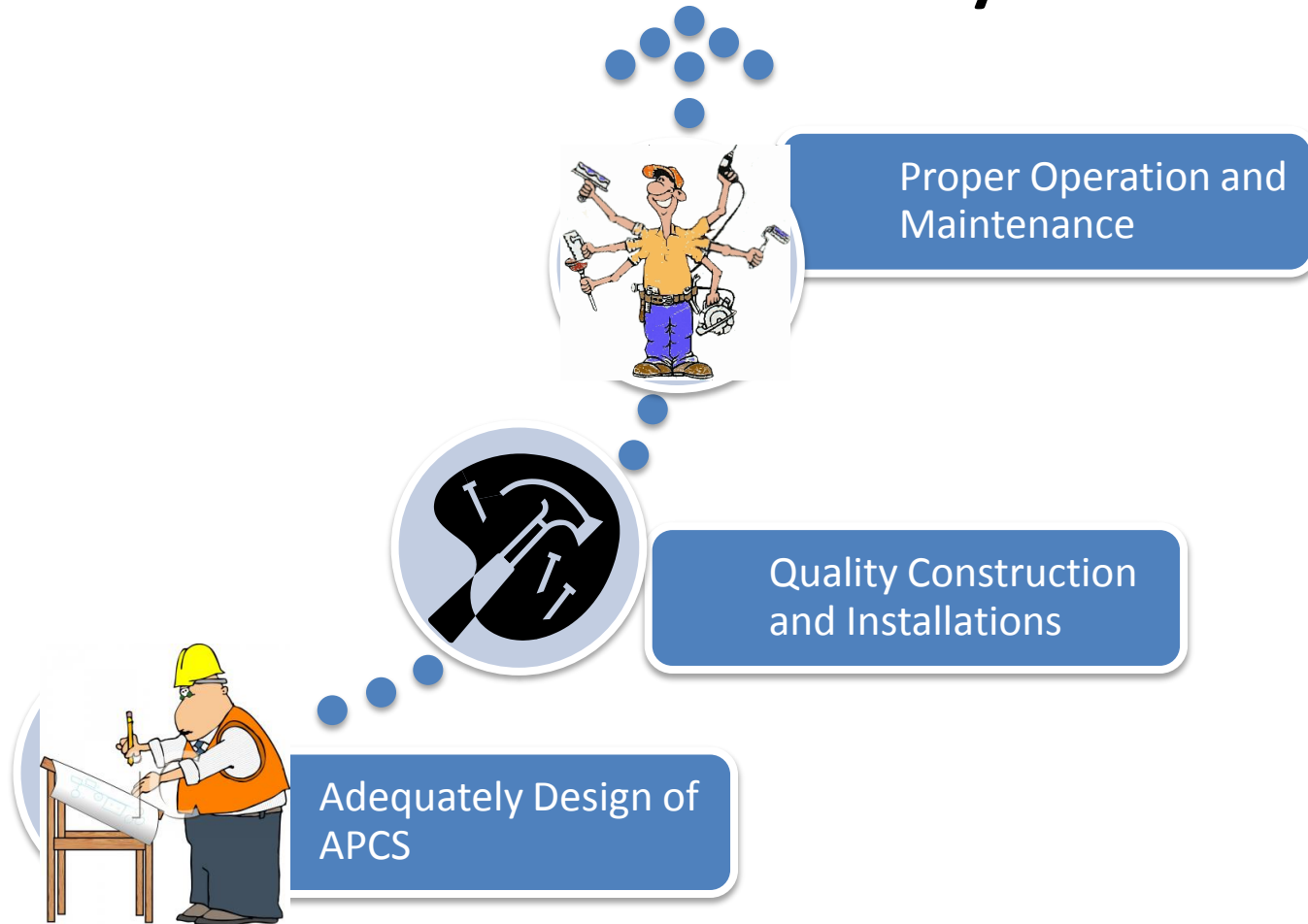
- Sila penuhkan borang dengan jelas dan bertaip. Setiap borang untuk satu alat ekzos/ sistem pengudaraan.
 Please fill in the form clearly and type). Each form for each exhaust/ vent.
- Borang dan semua maklumat hendaklah dijilidkan dalam fail yang sesuai untuk dikemukakan ke Jabatan ini.
 Preferably, forms and all relevant information should be presented in a suitable folder for submission to the Department.

A. MAKLUMAT ASAS PEMBERITAHUAN
GENERAL INFORMATION FOR NOTIFICATION

1. <u>Nama dan alamat pemunya/pemohon</u> : Name and address of applicant: _____ _____ _____	2. <u>Nama dan alamat pembuat/perunding</u> Name and address of manufacturer/consultant _____ _____ _____
3. <u>Pegawai syarikat yang boleh dihubungi</u> (Contact person) _____	4. <u>Pembuat/Perunding yang boleh dihubungi</u> (Contact person) _____
5. No. <u>Telefon</u> (tel. no.): _____ No. <u>Telefon Bimbit</u> (H/p No.): _____ No. <u>Faks</u> (Fax no.): _____ E-mel (E-mail): _____	6. No. <u>Telefon</u> (tel. no.): _____ No. <u>Telefon Bimbit</u> (H/p No.): _____ No. <u>Faks</u> (Fax no.): _____ E-mel (E-mail): _____
7. <u>Alamat pemasangan</u> (jika lain dari di atas)	8. <u>Jenis pengeluaran kilang</u> (jika berkaitan) :

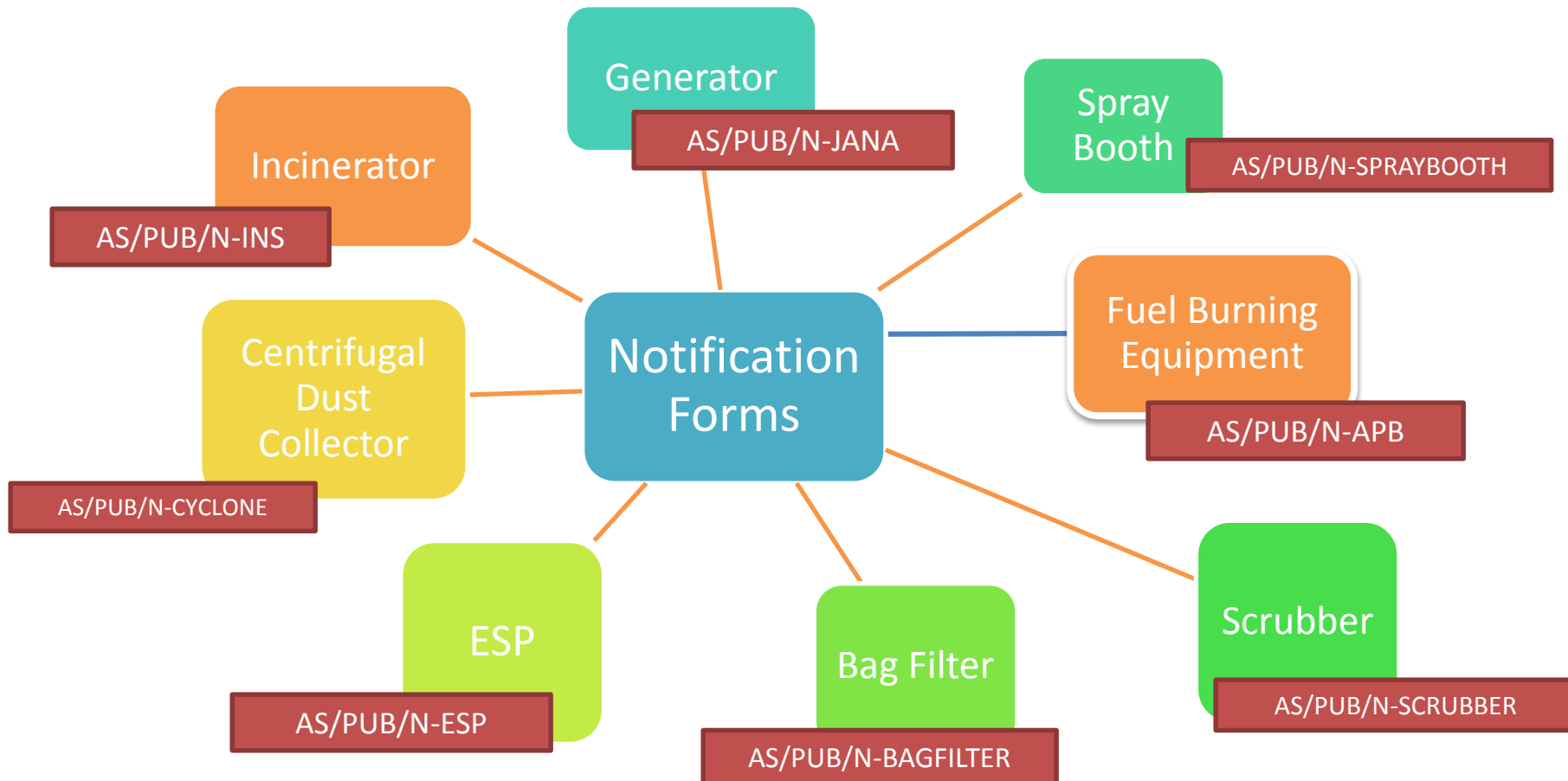
- All activities should be notified in writing.
- Notification should be made 30 days before any commencement of work. 

Pre-requisite for successful Air Pollution Control Systems



REGULATION 5

OBLIGATION TO NOTIFY



REGULATION 6

MEASURES TO REDUCE EMISSION

INDUSTRY LISTED IN THE 1ST SCHEDULE
(CAR 2014)



BAT DOCUMENTS

BAT
best
techniques
and effective
way to
prevent and
reduce
pollution

- Size, design and operating characteristics of the plant or the latest process
- Selection of raw material or fuel
- Implementation of the 3R concept
- Other processes within the plant design capacity & capability
- Other way of operating or setting within the plant design capacity & capability
- Proper handling & monitoring
- Efficient and continuous maintenance of a plant & equipment
- Reasonable economic & cost factors


REGULATION 7(4)

AIR POLLUTION CONTROL SYSTEM

- Sound Engineering Practices
 - To ensure that all components of APCS are in good working condition.
- Specification as in Guidance Document for Fuel Burning Equipments and Air Pollution Control Systems (GD APCS)
- 30 days after premises start operation :
 1. Written declaration
 2. As-built drawing



AS/PUB/DECLARE



AKUAN BERTULIS MENGENAI REKA BENTUK DAN PEMBINAAN SISTEM
KAWALAN PENCEMARAN UDARA
[Peraturan 7(5)]

WRITTEN DECLARATION ON DESIGN AND CONSTRUCTION OF AIR POLLUTION
CONTROL SYSTEM
[Regulation 7(5)]

Nama premis :
Name of premise :

Alamat premis :
Address of premise :

No. rujukan JAS (jika berkenaan) :
DOE reference number (if applicable) :

No. telefon : No. Faks :
Telephone number : Fax number :

Kami seperti nama di bawah, dengan ini mengaku bahawa sistem kawalan pencemaran udara yang telah direka bentuk dan dibina telah mematuhi keperluan dan spesifikasi minimum sebagaimana digariskan dalam Dokumen Panduan Mengenai Reka Bentuk dan Pembinaan Sistem Kawalan Pencemaran Udara yang ditetapkan oleh Ketua Pengarah Kualiti Alam Sekeliling.

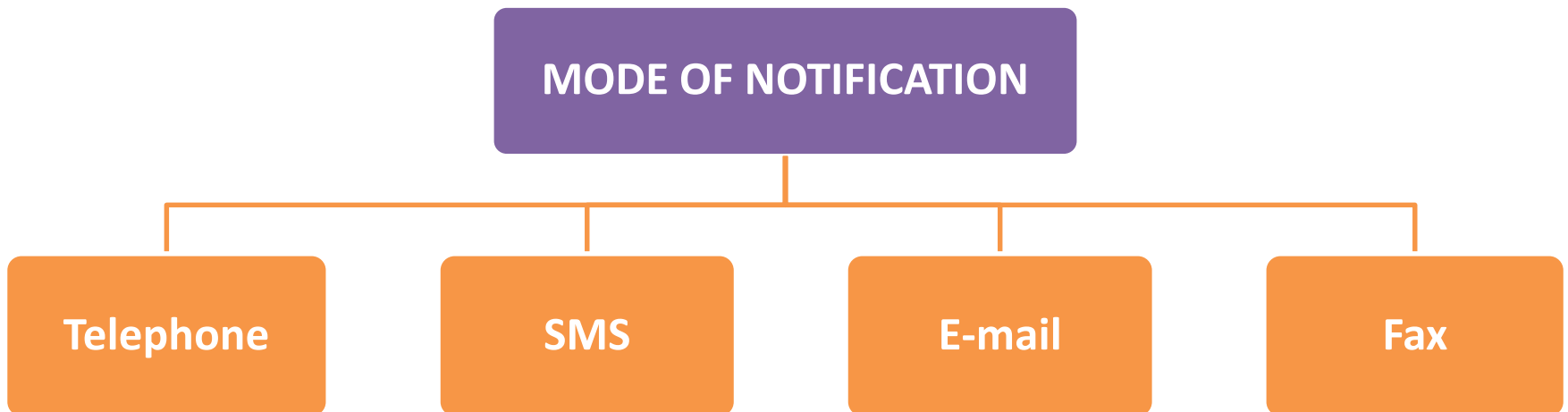
We the undersigned hereby declare that the air pollution control system has been designed and constructed in strict compliance with the minimum requirements and specifications as outlined in the Guidance Document on the Design and Construction of Air Pollution Control System as specified by the Director General of Environmental Quality

1/4

REGULATION 8

FAILURE IN OPERATIONS OF AIR POLLUTION CONTROL SYSTEM

The DG should be notified not later than 1 hour.



REGULATION 9: PERFORMANCE MONITORING OF AIR POLLUTION CONTROL SYSTEM

Refer Guidance Document Performance Monitoring of Air Pollution Control System

REGULATION 10: MAINTENANCE OF RECORDS

Records to be kept for 3 years, including:

- Manufacturing processes
- Maintenance and performance monitoring of the APCS

REGULATION 11: CHANGE OF OCCUPANCY

Conditions and restrictions of license shall be binding right after change of occupancy

REGULATION 12 OPACITY

Regulation 12(1)

Not darker than
shade No 1
Ringelmann
Chart

Not greater than 20%
opacity
Transmissiometer (1
minute averaging time)

Regulation 12(2)

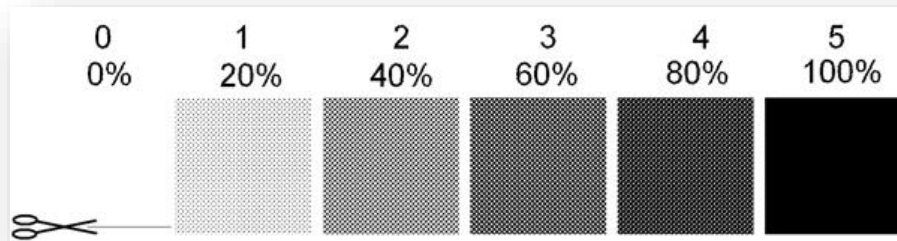
12(2)(a) No 2 Ringelmann
Chart in 5 minutes aggregate
within 1 hour period

12(2)(a) No 2 Ringelmann
Chart in 15 minutes aggregate
within 24 hours period

12(2)(b) At Start-up
No 2 Ringelmann Chart

Regulation 12(3)

Premis emitting \geq
2.5 kg/hour dust or
potentially emitting
smoke darker than
No 2 Ringelmann
Chart shall operate
a transmissometer
(averaging time: 1
minute)



Standard???

- Emission standard (had pengeluaran)
- Technology standard
- Operating standard

Konsep Standard dalam Peraturan Udara Bersih

- Emission standard (had pengeluaran)
 - Had spesifik mengikut sektor contoh habuk 150 mg/m³
- Technology standard
 - Dinyatakan dalam dokumen BAT, Guidance Document Design of Fuel Burning Document and Air Pollution Control System
- Operating standard
 - Dokumen pengawasan prestasi Alat Kawalan Pencemaran Udara

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

All industries under 1ST Schedule must comply to standards in 2nd & 3rd Schedule

1. Heat and Power Generation
2. Production and Processing of Ferrous Metals (Iron and Steel Mills)
3. Ferrous Metal Foundries
4. Production and Processing of Non-Ferrous Metals
5. Oil and Gas industry
6. Non-Metallic (Mineral) Industry : All sizes cement
7. Asphalt Mixing Plant (Stationary Installations)
8. Pulp and Paper Industry
9. Chemical and Petrochemical Industry
10. Solvent Use in Industry
11. Waste Incinerators

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Fuel Burning Equipment (FBE) using:-

- pulverized fuel
- any solid fuel ≥ 30 kg/hr
- any liquid or gaseous matter ≥ 15 kg/hr

have to comply with the standards specified in 2nd Schedule.

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

(I) Control of fuel burning equipment, incinerators and crematoria

1. Control of fuel quality for fuel burning equipment and incinerators not covered by the First Schedule:

Fuel type	Fuel	Fuel quality parameter
Liquid	All	Sulphur content < 500 ppm (per weight)
Solid	Coal	Sulphur content < 1% (per weight)
	Biomass	Wood, agricultural waste, etc.: air dry and in its natural composition (e.g. wood without coating, paint or other treatment)
		Residues from wood-based industries: without wood preservatives

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

2. Combustion emissions from fuel burning equipment and incinerators not covered by the First Schedule:

CO₂ reference content is 12%

Fuel type	Pollutant	Limit value	Monitoring
Liquid	Total particulate matter (PM) Where dust load emitted : a) $> 0.33 < 1.0$ kg/h b) ≥ 1.0 kg/h	50 mg/m ³	Once/year 2 times/year
Solid	Total particulate matter (PM) Where dust load emitted : a) $> 0.44 < 1.0$ kg/h b) $\geq 1.0 < 1.5$ kg/h c) $\geq 1.5 < 2.0$ kg/h d) $\geq 2.0 < 2.5$ kg/h e) ≥ 2.5 kg/h	150 mg/m ³	Once/year 2 times/year 3 times/year 4 times/year Continuous*
	Carbon monoxide (CO)	1000 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Second (2nd) Schedule

Control of NMVOC Emission

- Outlets
 - Halogenated hydrocarbons – 20 mg/m³
 - Others – 150 mg/m³

Control of Fugitive Emissions

- Refer Guidance Document of Fugitive Emission Control

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Third (3rd) Schedule

- i. 2nd Schedule limits applies to all industries if not specified in 3rd Schedule;
- ii. Specific industry in the title;
- iii. Capacities are stipulated in the title;
- iv. Percentage of O₂ or CO₂ reference content differ base on process and industry;
- v. Limit values are normalized;
- vi. Monitoring type: Periodic or Continuous; and
- vii. “Note” at the bottom of each sub-table is important

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

3rd SCHEDULE



HEAT AND POWER GENERATION

MW_e = electrical power

1. Boiler

O₂ reference content is 6% for solid fuels and 3% for others.

Fuel type	Pollutant	Capacity	Limit value	Monitoring
Solid and liquid fuels	Sum of SO ₂ and SO ₃ , expressed as SO ₂	> 10 MW _e	500 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	500 mg/m ³	Continuous*
	Hydrogen chloride (HCl)	> 10 - <100 MW _e	200 mg/m ³	Periodic
	Hydrogen chloride (HCl)	≥100 MW _e	100 mg/m ³	Periodic
	Hydrogen fluoride (HF)	> 10 - <100 MW _e	30 mg/m ³	Periodic
	Hydrogen fluoride (HF)	≥100 MW _e	15 mg/m ³	Periodic
	Carbon monoxide (CO)	> 10 MW _e	200 mg/m ³	Continuous*
	Total PM	> 10 MW _e	50 mg/m ³	Continuous*
	Mercury (Hg)	>10 MW _e	0.03 mg/m ³	Periodic
	PCDD/PCDF	> 10 MW _e	0.1 ng TEQ/m ³	Periodic
Gaseous fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	350 mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	50 mg/m ³	Continuous*
	Total PM	> 10 MW _e	5 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

2. Combustion turbines

O₂ reference content is 15%.

Fuel type	Pollutant	Capacity at ISO conditions	Limit value	Monitoring
Gaseous fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	150mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	100 mg/m ³	Continuous*
Liquid fuels	Sum of NO and NO ₂ expressed as NO ₂	> 10 MW _e	200 mg/m ³	Continuous*
	Carbon monoxide (CO)	> 10 MW _e	100 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

3. Generator sets for combined heat and power production with a total thermal output $\geq 3 \text{ MW}_e$:

O₂ reference content is 5%.

Fuel type	Pollutant	Capacity	Limit value	Monitoring
Liquid or gas fuels	Sum of NO and NO ₂ expressed as NO ₂	$\geq 3 \text{ MW}_e$	600mg/m ³	Periodic
	Carbon monoxide (CO)	$\geq 3 \text{ MW}_e$	650 mg/m ³	Periodic
	Total PM	$\geq 3 \text{ MW}_e$	80 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

B

PRODUCTION AND PROCESSING OF FERROUS METALS (IRON AND STEEL MILLS)

Source	Pollutant	Limit value	Monitoring
Sinter plants (waste gas from the sintering belt)	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	400 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Total lead as Pb	1 mg/m ³	Periodic
	NMVOC	75 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Coke ovens (@ 5% O ₂)	Total PM	10 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic
	Sulphur compounds as S	800 mg/m ³	Periodic
Blast furnace (Regenerator; @ 3% O ₂)	Total PM	50 mg/m ³	Continuous*
Basic oxygen furnace (converter gas)	Total PM	50 mg/m ³	Continuous*
Electric arc furnaces	Total PM	50 mg/m ³	Continuous*
Rolling mill: Thermal treatment furnace (@ 5% O ₂)	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13
LIMIT VALUES AND TECHNICAL STANDARDS



***FERROUS METAL FOUNDRIES
WITH A CAPACITY \geq 1 TON
MOLTEN METAL PER DAY***

Source	Pollutant	Limit value	Monitoring
Cupola furnace	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Periodic
	Carbon monoxide (CO)	150 mg/m ³	Periodic
Core production and casting	Amine	5 mg/m ³	Periodic
	Benzene	5 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS



PRODUCTION AND PROCESSING OF NON-FERROUS METALS WITH A CAPACITY ≥ 0.5 TONS PER DAY FOR LEAD OR CADMIUM OR ≥ 2 TONS PER DAY FOR OTHER METALS

Source	Pollutant	Limit value	Monitoring
Sinter plants (waste gas from the sintering belt)	Sum of SO ₂ and SO ₃ , expressed as SO ₂	500mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	400 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Total lead as Pb	1 mg/m ³	Periodic
	NMVOC	75 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Production of copper and zinc	Total PM	20 mg/m ³	Continuous*
Production of lead	Total PM	10 mg/m ³	Continuous*
Primary aluminium	Total PM	10 mg/m ³	Continuous*
	Fluorine compounds as HF	1 mg/m ³	Periodic
	Total Fluoride	1.5 mg/m ³	Periodic
	Sum of SO ₂ and SO ₃ , expressed as SO ₂	100 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Source	Pollutant	Limit value	Monitoring
Secondary aluminium ¹⁾	Total PM	10 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	500 mg/m ³	Periodic
Smelting, alloying and refining of aluminium ²⁾	Total PM	10 mg/m ³	Continuous*
Smelting, alloying and refining of other non-ferrous metals	Total PM	5 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

¹⁾ In secondary aluminium production, hexachloroethane shall not be used for smelting. "Secondary aluminium" is defined as re-melting of all kinds of used aluminium end products which might be coated, painted, and laminated.

²⁾ "Smelting, alloying and refining of aluminium" is defined as melting of pure aluminium and plain scrap.

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

E

***OIL AND GAS INDUSTRIES: REFINERIES
(ALL SIZES); NATURAL GAS PROCESSING
AND STORAGE; STORAGE AND
HANDLING OF PETROLEUM PRODUCTS***

Source	Pollutant	Limit value	Monitoring
Claus plant	Sulphur	Recovery > 95%	Periodic
Catalytic cracking	Total PM	40 mg/m ³	Continuous*
	Sum of SO ₂ and SO ₃ , expressed as SO ₂	1200 mg/m ³	Continuous*
Calcination	Total PM	40 mg/m ³	Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

F

NON-METALLIC (MINERAL) INDUSTRY: CEMENT PRODUCTION (ALL SIZES); MANUFACTURE OF GLASS INCLUDING GLASS FIBRE WITH A MELTING CAPACITY ≥ 1 TON OF PRODUCT PER DAY; MANUFACTURE OF CERAMIC PRODUCTS BY FIRING, ROOFING TILES, BRICKS, REFRACTORY BRICKS, TILES, CERAMIC GLASS, STONEWARE OR PORCELAIN, WITH A PRODUCTION CAPACITY ≥ 10 TONS OF PRODUCT PER DAY

O₂ reference content for:

- a) cement kilns is 10%
- b) flame-heated glass melting furnaces is 8%
- c) flame-heated pot furnaces and day tanks furnaces 13 %
- d) ceramic furnaces is 17%

Source	Pollutant	Limit value	Monitoring
Cement kilns	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Mercury	0.05 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic
Rotary furnaces for the manufacture of hard quicklime or sintering dolomite	Sum of NO and NO ₂ expressed as NO ₂	1500 mg/m ³	Continuous*
	Total PM	50 mg/m ³	Continuous*
	Mercury	0.05 mg/m ³	Periodic
	PCDD/PCDF	0.1 ng TEQ/m ³	Periodic

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

Source	Pollutant	Limit value	Monitoring
Glass furnaces	Sum of SO ₂ and SO ₃ , expressed as SO ₂	800 mg/m ³	Continuous*
	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Continuous*
	Total lead as Pb	5 mg/m ³	Periodic
	Total PM	50 mg/m ³	Continuous*
Ceramic furnaces	Sum of SO ₂ and SO ₃ , expressed as SO ₂	800 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	800 mg/m ³	Periodic
	Total PM	50 mg/m ³	Once/year
	Where dust load emitted : a) > 0.33 < 1.0 kg/h b) ≥ 1.0 < 2.0 kg/h c) ≥ 2.0 kg/h		
			2 times/year Continuous*

* Averaging time for continuous monitoring is 30 minutes

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS



ASPHALT MIXING PLANTS (STATIONARY INSTALLATIONS)

O₂ reference content is 17%.

Fuel type	Pollutant	Limit value	Monitoring
Liquid and gaseous	Carbon monoxide (CO)	0.50 g/m ³	Periodic
Solid	Carbon monoxide (CO)	1.0 g/m ³	Periodic
All fuels	Total PM	50mg/m ³	Periodic
	NMVOC	50 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

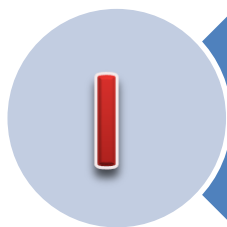
H

PULP AND PAPER INDUSTRY INCLUDING PAPER RECYCLING FACILITIES IN ALL SIZES

Source	Pollutant	Limit value	Monitoring
Recovery furnaces	PM	150 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	2 kg/t Air Dried Pulp (ADP)	Periodic
Lime kilns	Hydrogen sulfide (H ₂ S)	15 mg/m ³	Periodic
	Sum of NO and NO ₂ expressed as NO ₂	2 kg/t Air Dried Pulp (ADP)	Periodic
Sulfite mills	Total sulfur	1.5 kg/t Air Dried Pulp (ADP)	Periodic
Kraft and others	Total sulfur	1.0 kg/t Air Dried Pulp (ADP)	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS



CHEMICAL AND PETROCHEMICAL INDUSTRY IN ALL SIZES

Pollutant	Limit value	Monitoring
Hydrogen chloride (HCl)	200 mg/m ³	Periodic
Sum of NO and NO ₂ expressed as NO ₂	700 mg/m ³	Periodic
Ammonia (NH ₃)	76 mg/m ³	Periodic
Chlorine (Cl)	32 mg/m ³	Periodic
Sum of SO ₂ and SO ₃ , expressed as SO ₂	100 mg/m ³	Periodic
Mercury (Hg)	0.05 mg/m ³	Periodic
Hydrogen Sulphide (H ₂ S)	7.5 mg/m ³	Periodic
Total PM	50 mg/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS



J

SOLVENT USE IN INDUSTRY: FACILITIES FOR THE SURFACE TREATMENT OF SUBSTANCES, OBJECTS OR PRODUCTS USING ORGANIC SOLVENTS, IN PARTICULAR FOR DRESSING, PRINTING, COATING, DEGREASING, WATERPROOFING, SIZING, PAINTING, CLEANING OR IMPREGNATING, FAT EXTRACTION, WITH A SOLVENT CONSUMPTION CAPACITY OF MORE THAN 200 TONNES PER YEAR

1. Facilities of this category shall establish a solvent management plan in order to set-up a reduction strategy.
2. Solvent losses shall be reduced in accordance with Best Available Techniques Economically Achievable limiting these losses to not more than 30% of the solvent input as a general rule.
3. Actual reduction targets and their time frame shall be set on a case-by-case basis as outlined in the Guidance Document on Fugitive Emission Control.

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS



WASTE INCINERATORS IN ALL SIZES

O₂ reference content is 11%.

Pollutant	Limit value	Monitoring
Total PM	100 mg/m ³	Continuous*
NMVOC as total organic carbon	10 mg/m ³	Continuous*
Hydrogen chloride (HCl)	40 mg/m ³	Continuous*
Hydrogen fluoride (HF)	1 mg/m ³	Continuous*
Sum of SO ₂ and SO ₃ , expressed as SO ₂	50 mg/m ³	Continuous*
Sum of NO and NO ₂ expressed as NO ₂	200 mg/m ³	Continuous*
Carbon monoxide (CO)	50 mg/m ³	Continuous*
Cadmium and its compounds, expressed as cadmium (Cd)	Total	Periodic
Thallium and its compounds, expressed as thallium (Tl)	0.05 mg/m ³	
Mercury and its compounds, expressed as mercury (Hg)	0.05 mg/m ³	Periodic
Antimony (Sb), Arsenic (As), Lead (Pb), Chromium (Cr), Cobalt (Co), Copper (Cu), Manganese (Mn), Nickel (Ni), Vanadium (V), and their compounds expressed as the element	Total 0.5 mg/m ³	Periodic
PCDD/PCDF	0.1 ng TEQ/m ³	Periodic

REGULATION 13

LIMIT VALUES AND TECHNICAL STANDARDS

TOXICITY EQUIVALENTS FACTOR (TEFs) FOR DIOXIN AND FURAN

**Forth (4th)
SCHEDULE**

Chlorine Position		Component	Equivalents Factor
DIOXIN			
(a)	2,3,7,8	Tetraklorodibenzodioksin (TCDD)	1
(b)	1,2,3,7,8	Pentaklorodibenzodioksin (PeCDD)	0.5
(c)	1,2,3,4,7,8	Heksaklorodibenzodioksin (HxCDD)	0.1
(d)	1,2,3,7,8,9	Heksaklorodibenzodioksin (HxCDD)	0.1
(e)	1,2,3,6,7,8	Heksaklorodibenzodioksin (HxCDD)	0.1
(f)	1,2,3,4,6,7,8	Heptaklorodibenzodioksin (HpCDD)	0.01
(g)	1,2,3,4,6,7,8,9	Oktaklorodibenzodioksin (OCDD)	0.001
FURAN			
(a)	2,3,7,8	Tetraklorodibenzofuran (TCDF)	0.1
(b)	2,3,4,7,8	Pentaklorodibenzofuran (PeCDF)	0.5
(c)	1,2,3,7,8	Pentaklorodibenzofuran (PeCDF)	0.05
(d)	1,2,3,4,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(e)	1,2,3,7,8,9	Heksaklorodibenzofuran (HxCDF)	0.1
(f)	1,2,3,6,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(g)	2,3,4,6,7,8	Heksaklorodibenzofuran (HxCDF)	0.1
(h)	1,2,3,4,6,7,8	Heptaklorodibenzofuran (HpCDF)	0.01
(i)	1,2,3,4,7,8,9	Heptaklorodibenzofuran (HpCDF)	0.01
(j)	1,2,3,4,6,7,8,9	Oktaklorodibenzofuran (OCDF)	0.001

PERATURAN 13 NILAI BATAS DAN STANDARD TEKNIKAL

BACAAN PENGELUARAN PERLU DINORMALKAN

Bacaan
normalized
pada STP
(273K,
101.3 kPa)



Tentukan
rujukan O₂
yang
ditetapkan

Contoh :

Bagi loji janakuasa menggunakan bahanapi pepejal, rujukan oksigen adalah 6% dan nilai had pengeluaran NO₂ adalah 500 mg/m³. Jika bacaan yang diukur adalah 490 mg/m³ pada bacaan oksigen 8%, maka bacaan yang diukur perlu *normalized* dengan menggunakan formula berikut:

$$G_N = [G] \times \frac{(20.9 - O_{2,ref})}{(20.9 - O_{2,measured})}$$

O_{2, measured} = O₂ reading, % vol

O_{2, ref} = reference oxygen content, % vol

[G] = measured gas concentration

[G_N] = normalized gas concentration

20.9 = percentage of oxygen in ambient air

$$\begin{aligned} G_N &= [490] \times \frac{(20.9 - 6)}{(20.9 - 8)} \\ &= 566 \frac{mg}{m^3} \end{aligned}$$

PERATURAN 13 NILAI BATAS DAN STANDARD TEKNIKAL

BACAAN PENGELUARAN PERLU DINORMALKAN

Bacaan
normalized
pada STP
(273K,
101.3 kPa)



Tentukan
rujukan
CO₂ adalah
12%

Contoh :

Bagi pelepasan daripada peralatan pembakaran bahanapi yang menggunakan bahanapi pepejal, rujukan karbon dioksida adalah 12% dan nilai had pengeluaran jirim zarah (PM) adalah 150 mg/m³. Jika bacaan yang diukur adalah 140 mg/m³ pada bacaan karbon dioksida 8%, maka:

$$G_N = [G] \times \frac{CO_{2,ref}}{CO_{2,measured}}$$

CO_{2, ref}

CO_{2, measured} = CO₂ measured, % vol

= reference carbon dioxide content, % vol

[G] = measured gas concentration

[G_N] = normalized gas concentration

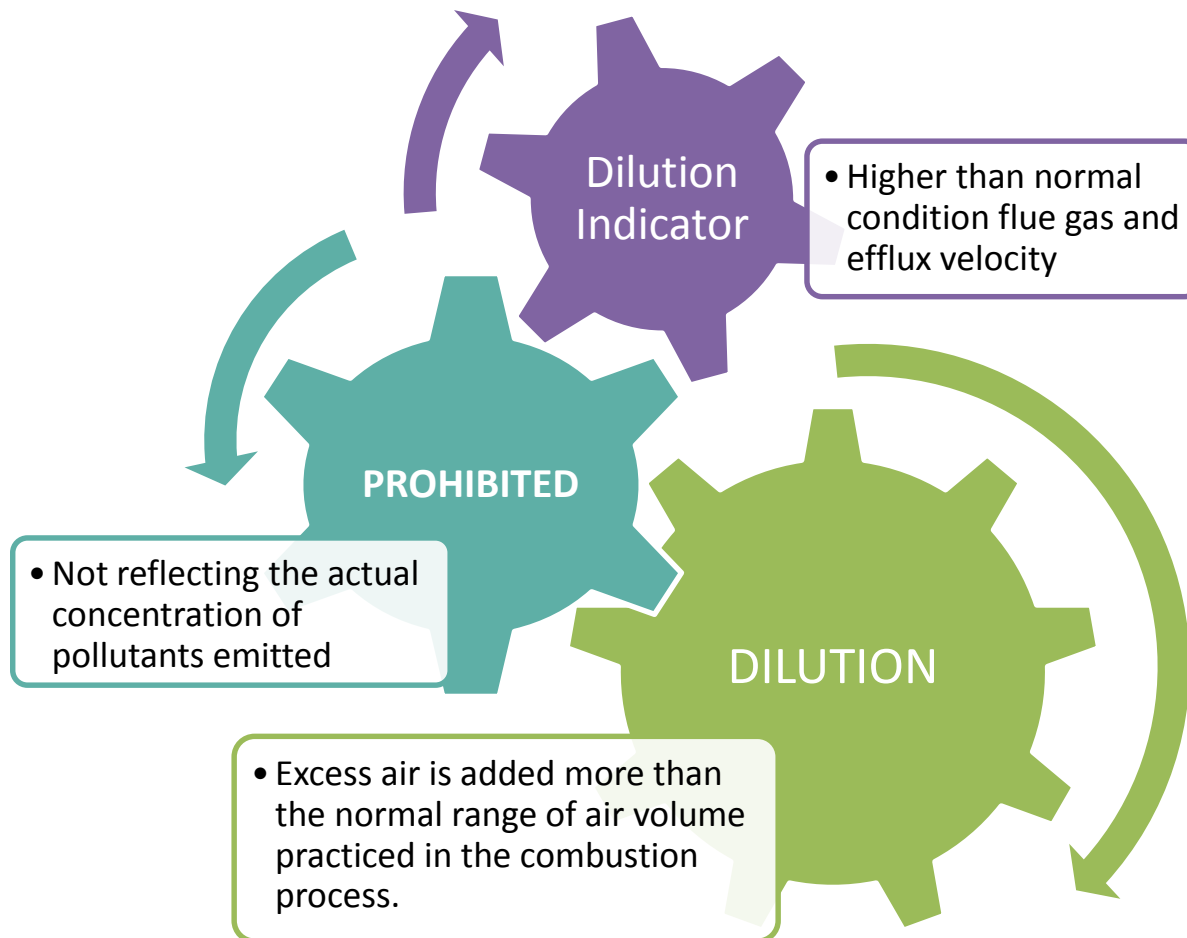
$$\begin{aligned} G_N &= [140] \times \frac{(12)}{(8)} \\ &= 210 \text{ mg/m}^3 \end{aligned}$$

PELEPASAN KARBON MONOKSIDA

Ditetapkan mengikut keperluan
(*case to case basis*) bagi proses
yang memerlukan pembakaran
tidak lengkap seperti kilang
penghasilan kayu arang (*kiln*)

REGULATION 14

PROHIBITION ON EMISSION DILUTION



REGULATION 15

HAZARDOUS SUBSTANCES

Fifth (5th) Schedule

CATEGORY (1)

- **Extremely Hazardous Substances**

CATEGORY (2)

- **Carcinogenic Substances**

CATEGORY (3)

- **Gaseous and volatile organic substances**

CATEGORY (4)

- **Gaseous and volatile inorganic substances**
 - (a) Volatile inorganic substances other than Oxides of Sulfur and Oxides of Nitrogen
 - (b) Oxides of Sulfur and Oxides of Nitrogen

CATEGORY (5)

- **Particulate inorganic substances**

CATEGORY (6)

- **Fibres**

REGULATION 15

HAZARDOUS SUBSTANCES

**Hazardous substances are listed in:
“LIST OF HAZARDOUS SUBSTANCES UNDER REGULATION 15,
ENVIRONMENTAL QUALITY (CLEAN AIR) REGULATIONS 2014”**

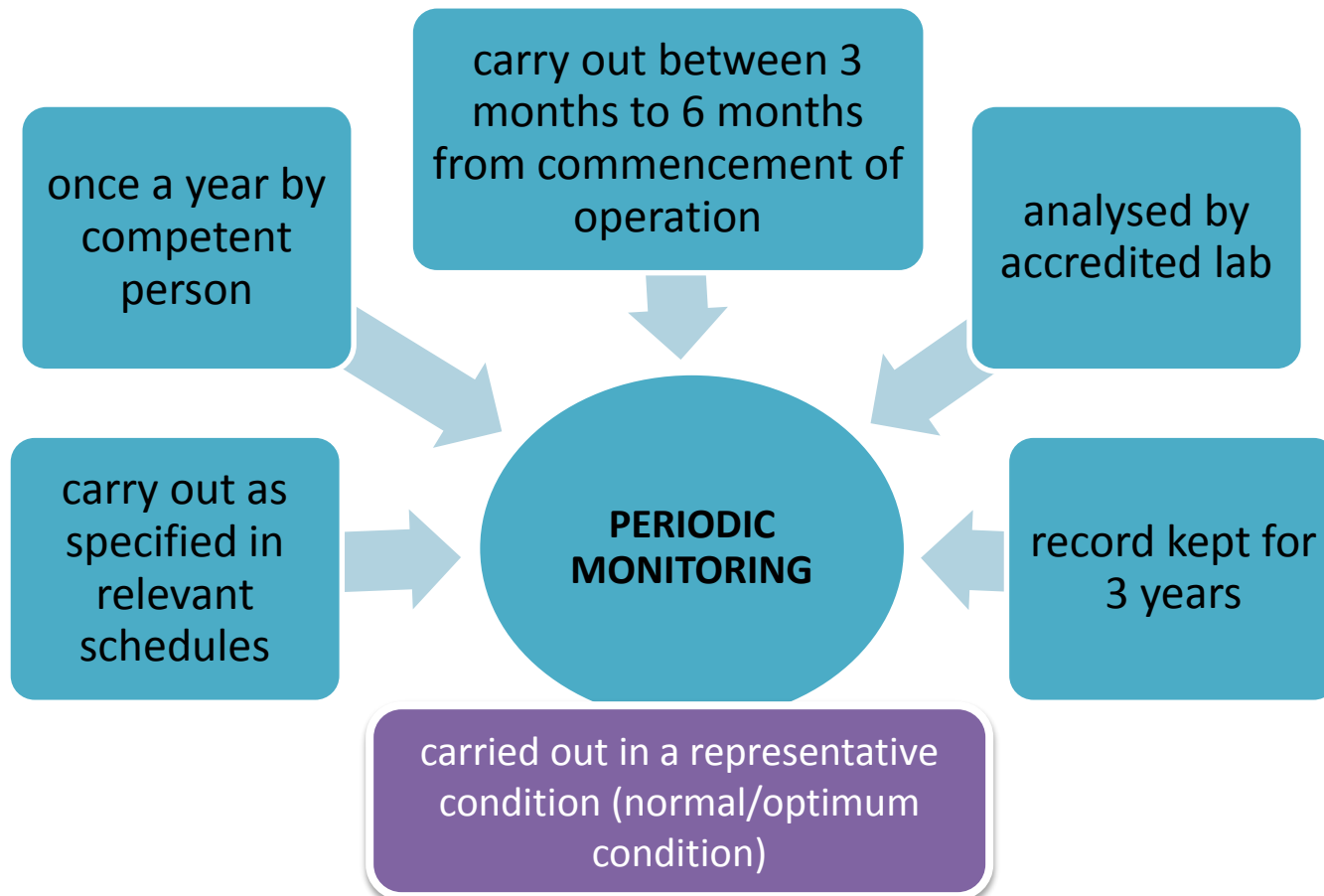
CUMULATION RULE

Classes (1) and (2) occur
simultaneously, emission standards
not exceeding class (2)

Classes (1) and (3), classes (2) and (3)
or classes (1), (2) and (3) occur
simultaneously, emission standards
not exceeding class (3)

REGULATION 16

PERIODIC MONITORING



REGULATION 17

CONTINUOUS EMISSION MONITORING

Refer to the specification in these documents

Volume I

- *Guideline For The Installation & Maintenance Of Continuous Emission Monitoring Systems (CEMS) For Industrial Premises / Facilities*

Volume II

- *Guideline For The Continuous Emission Monitoring Systems- Data Interface System (CEMS-DIS)(Version 7.0)*