Environmental Permitting Technical Note 5/1(18)

Reference document for the incineration / combustion of waste wood

Revised: xxx 2018

1 Legal Status

1.1 This note applies to the whole of the UK. It is issued by the Secretary of State, the Welsh Government, the Scottish Government and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland (DAERA).

1.2 This note is issued as statutory guidance in England and Wales under regulation 65 of the Environmental Permitting Regulations; and in Northern Ireland under regulation 41(1) of the Pollution Prevention and Control (Industrial Emissions) Regulations. This note is also issued as guidance in Scotland. This note will be treated as one of the material considerations when determining any appeals against a decision made under this legislation.

1.3 This note supersedes PG1/12 (13) – Statutory guidance for combustion of waste wood.

2 Scope

2.1 England and Wales

This note applies to activities described in Schedule 1, Part 2, Chapter 5, Section 5.1, Part B, (a) (v) of the Environmental Permitting Regulations (England and Wales) 2016 as described below.

Part B

(a) The incineration in a small waste incineration plant with an aggregate capacity of 50kg or more per hour of the following waste –

(v) wood waste with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coatings.

Scotland

This note applies to the activity described in Schedule 1, Part 1, Chapter 5, Section 5.1 of the Pollution Prevention and Control (Scotland) Regulations 2012.

Part B

(a) The incineration of biomass waste in an incineration or co-incineration plant with a capacity of more than 50kg per hour and equal to or less than 3 tonnes/hour.

Northern Ireland

This note applies to the activity described in Schedule 1, Part 1, Chapter 5, Section 5.1 of the Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013.

Part C

(a) The incineration of non-hazardous solid or liquid waste in an excluded plant but which has a capacity of 50 kg or more per hour but less than 1 tonne per hour.

(iv) wood waste with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating, and which includes in particular such wood waste originating from construction and demolition waste.

2.2 This note does not apply to plants with a capacity of 3 tonnes or more per hour, (or 1 tonne or more per hour in Northern Ireland) which should be permitted as a Section 5.1 Part A(1) (b) activity in England and Wales (Part A in Scotland and Northern Ireland).

2.3 In England and Wales, the footnote in the Regulations to the activity described above, says that when determining the extent of an installation carrying on that activity; any location where the associated storage or handling of wastes and residues which are to be incinerated as part of that activity is carried on, is to be ignored.

2.4 Therefore, this note applies only to the incineration / combustion process itself and the immediate storage of bottom ash. It does not apply to the associated storage, handling or pre-treatment of waste wood nor to any downstream post-treatment of bottom ash. Regulators and operators should note that a separate waste operations permit or exemption will be needed to cover these activities, except where they are storing their own arisings of wood waste as described in 2.1.

In England, the Environment Agency has recently published a Regulatory Position Statement (Mo.213) on storing and drying waste wood before it is burnt in a 5.1B permitted plant. This waves the requirement for a waste operations permit in some circumstances, subject to certain conditions.

The operator will also need to meet their duty of care obligations for any wastes they receive under section 34 of the Environmental Protection Act 1990.

2.5 This note does not apply to any activities which fall within the scope of Chapter IV of the EU Industrial Emissions Directive (2010/75/EU) (IED). Neither does Chapter IV of the IED apply to the activities which are the subject of this note.

2.6 Waste wood other than that specified in table 4.1 is outside the scope of this note and its incineration must be carried out in a plant that is compliant with Chapter IV of the of the IED.

2.7 In determining whether or not two or more appliances should be treated as a single plant with an aggregate capacity of 50 Kg/hr or more; regulators should have regard to the following points:

(a) could the function of the appliances equally be undertaken by a single larger appliance?
(b) are the appliances fed from the same fuel storage silo?
(c) are the appliances connected to a common indirect heating system?
(d) are the appliances all associated with the same business activity?

In general, multiple appliances of less than 50 Kg/hr should be justified on the basis of the site specific heating requirements, their use as a means of avoiding regulation through disaggregation is to be discouraged.

2.8 Other than as described in 2.10; from 20th December 2018, all plants of 1MW rated thermal input or more will come within the scope of the Medium Combustion Plant Directive (MCPD) 2015/2193/EU. The requirements of MCPD have been built into Sections 4 and 5 of this reference document.

2.9 Other than as described in 2.10; all plants of 1 MW aggregated rated thermal input or more that come into operation from 20th December 2018 will need to comply with the new plant requirements of MCPD.

For plants in operation before 20th December 2018; plants of 5MW rated thermal input or more will need to comply with MCPD requirements for existing plant from 1st January 2025. Plants of 1 MW rated thermal input or more up to 5 MW will need to comply with MCPD requirements for existing plant from 1st January 2030.

2.10 Where the plant meets one of the criteria in Article 2(3) of the MCPD, e.g. the gaseous products of the combustion are used for the direct heating, drying or any other treatment of objects and material; then MCPD does not apply, but such plants will still need a Part B permit.

Similarly, MCPD does not apply to post-combustion plants designed to purify the waste gases from industrial processes by combustion, and which are not operated as independent combustion plants. Sometimes waste wood is transferred in a closed system by air from a woodworking process, through a cyclone directly to a storage hopper for automated feed into a furnace, where the combustion of the waste wood is an integral part of the arrestment plant for woodworking processes. However, such plants may still need a Part B permit.

2.11 In England and Wales, the regulator for those plants described in 2.9 will be the Environment Agency, otherwise the regulator will be the Local Authority. In Scotland SEPA is the regulator for all plant. In Northern Ireland, the regulator will be NIEA in relation to Part A and B plant, while for Part C it will be the relevant District Council.

In England and Wales, if the MCP is part of a Part B or Part A(2) installation, then the installation will have two environmental permits. One from the EA or NRW for the MCP and one from the local authority for the Part B or Part A(2) activities (minus the MCP). In Northern Ireland, if the MCP is not part of a Part A or Part B installation, then the operator will need to have two permits. One from the District Council where the MCP is located and one from the Chief Inspector (NIEA) for the Part A or Part B activities.

2.12 Note: the rated thermal input is taken to mean the net rated thermal input, i.e. that based on the net calorific value (or lower heating value) of the fuel. The relationship between throughput and the thermal input and output of a burner is dependent on the calorific value of the fuel and the efficiency of the appliance. As a guide, table 2.1 shows this relationship based on a wood waste net calorific value of 16 KJ/kg and an 85% efficiency. However, it is recommended that the operator supplies accurate information based on the circumstances of use of their own appliance.

Table 2.1: Comparison of maximum burn rate and net rated thermal input and output.

Max burn rate	Net Rated Thermal Input	Thermal Output
50 kg/hr	222 kW	189 kW
90 kg/hr	400 kW	340 kW
225 kg/hr	1MW	850 kW
1125 kg/hr	5 MW	4.25 MW
3 T/hr	13.33MW	11.33MW

3 General Conditions

3.1 In general terms, this note describes what is BAT for those activities falling with its scope. This note also, where appropriate, gives details of any mandatory requirements affecting air emissions which are in force (or about to come into force) at the time of publication. Unless otherwise stated, the provisions of this note are generally applicable.

3.2 The techniques listed and described in this reference document are neither prescriptive nor exhaustive. Other techniques may be used provided that they ensure at least an equivalent level of environmental protection.

3.3 Sections 4 and 5 set out a number of matters which should be considered for inclusion as permit conditions.

3.4 It is important to note, however, that this should not be taken as a short cut for regulators to a proper determination of BAT. In some circumstances, permit conditions including emission limit values based on BAT may be tighter than those set out in MCP. In individual cases it may be justified to:

a) include additional conditions;
b) include different conditions;
c) not include conditions relating to some of the matters indicated.

4 Summary of Best Available Techniques

4.1 Acceptable waste to be burnt

4.1.1 Only clean wood waste, as described in 4.1.2 below, should be incinerated / combusted in a 5.1 Part B appliance.

4.1.2 All movement of waste (including wood waste) must be accompanied by a waste transfer note and the waste classification code must be identified. This is a Duty of Care legal requirement. A full list of waste codes are set out in Commission decision 2014/955/EU amending the list of EU waste codes. Only those waste codes shown in Table 4.1 (as restricted) are to be incinerated / combusted.

Table 4.1: Acceptable waste codes

European Waste Classification Codes	Description	Further restriction
02 01 03 02 01 07	Plant tissue waste from agriculture, horticulture and forestry	
03 01 01	Waste bark and cork from wood processing and the production of panels and furniture	No chemical treatments applied.
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer ([1]) other than those mentioned in 03 01 04	No chemical treatments applied. ([1]) Only veneer that is fixed to the board.
03 03 01	Waste bark and wood from pulp, paper and cardboard production and processing	No chemical treatments applied.
15 01 03	Wooden packaging	Visibly clean wooden packaging including pallets, no chemical treatments applied.
19 12 07	Wood other than wood containing hazardous substances (19 12 06) from waste management facilities	Source segregated visibly clean single waste wood streams such as pallets, where no chemical treatments have been applied.
		Post segregation of mixed waste wood streams from civic amenity sites or skip hire operators is not sufficient.

For the avoidance of doubt, any waste wood which has been classified as hazardous waste or any waste wood originating from construction and demolition works cannot be incinerated / combusted in a 5.1 Part B appliance.

4.2 Plant design and operation ([2])

4.2.1 Variation in fuel size and moisture content limits the ability of combustion control systems to produce good combustion. Fuel with a narrow size and moisture distribution burns much better than mixed-size fuels or fuel of variable moisture level. Uncovered storage of fuels should be avoided to keep fuel dry. Separate storage and feeding of different waste wood types e.g. offcuts, briquettes, woodchips and dust allows improved control of combustion conditions.

4.2.2 Continuous feed produces better combustion than stop-start burning; where the amount of fuel fed into the combustion chamber is controlled automatically and balanced with the amounts of primary and secondary air to complete the combustion process. Automatic fuel feed systems prevent the emission of smoke fumes and reduce the emission of other pollutants. For existing processes, automatic feed systems should be used wherever practicable. For new processes, automatic fuel feed systems should be used.

4.2.3 On start-up from cold, prior to the introduction of waste wood into the furnace, the combustion zone temperature needs to be raised, using an ancillary burner fired by gas or oil, alternatively virgin wood may be used. Waste wood should not be burnt during the start-up from cold.

When the burner is idling, carbon monoxide concentrations can rise significantly. Whilst in many cases it is technically feasible to prevent idling, in a few cases it may only be possible to minimise it. Operators should justify to the regulator if this is not technically feasible.

4.2.4 Good combustion needs management and control of a number of parameters:

- fuel content and its rate of feed (see 4.2.1 and 4.2.2);
- primary and secondary air;
- temperature in the chamber and the heat exchanger;
- oxygen levels.

4.2.5 Good control of air flow is essential to thermal efficiency. More air than the theoretical minimum required for complete combustion should be supplied to ensure stable combustion and prevent the formation of carbon monoxide (CO). Excess CO is a good indicator of incomplete combustion. Too much excess air will increase the carryover of dust, lower temperature, resulting in a loss of thermal efficiency.

Some biomass combustion plants may have re-circulated flue gases to ensure optimum combustion, with minimum excess air. Flue gas recirculation will also help reduce NO_X emissions.

4.2.6 Normally, the combustion gases are then directed into a boiler section either to produce hot water, steam or thermal fluid. The energy produced might be

used for process heat, building or district heat, electricity or for combined heat and power. A good turndown ratio, i.e. the ratio between maximum and minimum firing rates, over which emission parameters can be satisfied will enable greater thermal efficiency by better matching the heat requirement with the waste wood feed rate.

([2]) Where relevant, reference should also be made to sections 4.2 and 4.3 of technical note 1/1(18).

4.3 Air quality, dispersion and dilution

4.3.1 Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are deemed harmless.

4.3.2 Emissions to air should be free from dark smoke (see tables 5.2 to 5.5) and from offensive odour outside the site boundary, as perceived by the regulator. Good combustion should achieve that aim.

4.3.3 All new and replacement plant should submit an air quality report which details the long term and short term process contribution as part of their application. The process contribution can be calculated using the Environment Agency H1 guidance.

4.3.4 Emissions from the permitted process shall not contribute significantly to any exceedance of EU air quality limit values or objectives of the Air Quality Strategy for England, Scotland, Wales and Northern Ireland for sulphur dioxide, oxides of nitrogen and particulate matter (PM_{10} and $PM_{2.5}$).

4.3.5 In areas where air quality standards or objectives are being breached or are in serious risk of breach and it is clear from the air quality report or detailed review and assessment (for existing installations) that the permitted process itself is a significant contributor to the problem, it is likely that the regulator will impose tighter emission limits than those set out in tables 5.2 to 5.5 of this Technical Note. The need for tighter emission limits might be offset, fully or in part, by increasing the stack height and/or exit velocity.

4.3.6 The aim should be to ensure that the process contribution is no more than 1% of the relevant long term EQS and/or 10% of the relevant short term EQS at sensitive receptors. Where this cannot be demonstrated through simple calculations, (e.g. the Environment Agency's H1 methodology), the applicant will need to use computer based air dispersion models (e.g. ADMS, AERMOD) or some form of intermediate screening tool.

Note when assessing the impact of particulate emissions (PM_{10} and $PM_{2.5}$), a first assumption will normally be to assume that all the dust emissions are PM_{10} or $PM_{2.5}$. Data on particle size distribution of dust emissions may be needed where the process contribution cannot be shown to be no more than 1% of the long term EQS and/or 10% of the short term EQS at sensitive

receptors using this initial assumption, as an alternative to, or in combination with more detailed assessment methodologies.

4.3.7 Where necessary the regulator should include the minimum stack height and exit velocity within the environmental permit.

4.3.8 In order to ensure dispersion is not impaired by either low exit velocity at the point of discharge, or deflection of the discharge, a cap, or other restriction, should not be used at the stack exit. However, a cone may sometimes be useful to increase the exit velocity to achieve greater dispersion.

4.4 Abatement ([3])

4.4.1 Good combustion techniques minimise dust emissions; (which includes emissions of particulate matter of all particle sizes, i.e. PM_{10} and $PM_{2.5}$). Poor combustion control, e.g. too high a temperature and insufficient oxygen, will increase dust emissions.

Where necessary, in order to reduce emissions to air of dust to meet ELVs, abatement should be installed. Table 4.2 shows suitable techniques that can be deployed either individually or collectively depending on the level of abatement required:

Table 4.2: Dust performance rates

Technique	Performance
Cyclones (multicyclones)	< 60mg/m^3 ([1])
Electrostatic precipitators (ESP)	< 60mg/m^3
Fabric Filters (bag house)	< 10mg/m^3
Ceramic Filters	< 10mg/m^3
([1]) Emissions from cyclones will be dependent on the flow rate of the exhaust gas and the characteristics (i.e. particle size distribution) of the dust. Deviation from the design conditions may adversely affect their performance.	

([3]) Where relevant, reference should also be made to section 4.1 of technical note 1/1(18).

4.5 Emission testing

4.5.1 Where annual emission testing is required it is essential that the operator has sufficient monitoring locations for testing. Guidance on testing locations can be found in the Environment Agency's Technical Guidance Note (Monitoring) M1: Sampling requirements for stack monitoring or appropriate regulator's guidance. It is also advisable for the operator to employ the services of an emissions testing company before they apply for a permit to determine if emissions monitoring can be undertaken.

4.5.2 Where emissions monitoring is required but cannot be safely or correctly undertaken the regulator should refuse the permit.

4.5.3 If considered necessary the regulator should include permit conditions detailing the requirements needed, (e.g. design, access, etc.) to undertake periodic emissions testing.

4.6 Management

4.6.1 Effective management is central to environmental performance; it is an important component of BAT and of achieving compliance with permit conditions. It is therefore desirable that installations put in place some form of structured environmental management system that addresses the following areas.

(a) Cleaning and maintenance
(b) Training and plant operation
(c) Waste acceptance criteria
(d) Bottom ash storage and disposal
(e) Emission monitoring
(f) Plant failures
(g) Record keeping

If the operator already has a published standard (i.e. ISO 14001) they do not need to set up a separate system. Regulators should use their discretion, in consultation with individual operators, to agree the appropriate level of EMS dependent to the nature and size of the particular process.

4.7 Cleaning and maintenance

4.7.1 Effective preventative maintenance and cleaning plays a key role in achieving compliance with emission limits.

4.7.2 Regular cleaning of the flues and ductwork should be undertaken to ensure that dispersion rates are not affected by a build-up of material.

4.7.3 All aspects of the process including all plant, buildings and equipment should be maintained in line with manufactures recommendations. Where there are no manufactures recommendations then the operator should devise their own maintenance procedures.

4.8 Training and operation

4.8.1 In order to minimise the risk of emissions during operation all plant should be operated in accordance with the manufactures operating manual. Where there is not a manufacturers' operating manual the operator should develop their own operating procedures that also includes plant failures.

4.8.2 Only staff that are trained should be authorised to operate the plant.

4.9 Waste acceptance criteria

4.9.1 The operator must have procedures in place to ensure that only waste wood described in table 4.1 is incinerated / combusted.

4.9.2 Where an operator is incinerating / combusting their own waste wood arisings, the operator will need to demonstrate that the waste wood conforms to that described in table 4.1.

4.9.3 Where waste wood is imported, all incoming waste will need to be accompanied by a duty of care note which includes the European Waste Classification Code. In addition, the operator will need to demonstrate not only that the wood is untreated; but also that it has been kept separate from wood that might contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coatings.

4.9.4 To this end, it is advisable for the regulator to routinely check all duty of care notes as part of their programmed inspection.

4.10 Bottom ash storage and disposal

4.10.1 All incineration / combustion of solid fuels results in some bottom ash being produced. If not controlled correctly this could result in the ash escaping off site.

4.10.2 The furnace should be designed with the aim of minimising the period of time during which the operator needs to gain access to the combustion space for the purpose of de-ashing.

For new processes, of 1MW thermal input or more, automatic de-ashing systems should be used. For existing processes, automatic de-ashing systems should be used where practicable.

4.10.3 Bottom ash should be stored and disposed of in a manner to prevent the escape of dusty waste, i.e. in covered containers, purpose-built silos or undercover.

4.11 Record keeping

4.11.1 The operator shall keep records of:

a) All inspections both by external bodies and internal employees,
b) Maintenance including cleaning, maintenance undertaken by external contractors or internal personnel and breakdowns,
c) Operating procedures with subsequent training records,
d) Emission testing, periodic and operator assessments as well as details of any testing platforms.

And makes available these records, and any relevant duty of care notes, to the regulator when requested.

4.11.2 In addition for medium combustion plants the operator shall keep a record of:

a) the type and quantities of fuels used in the plant
b) information proving the effective continuous operation of secondary abatement equipment needed in order to meet the emission limit values; and,
c) any malfunctions or breakdown of secondary abatement equipment.

4.11.3 Records must be kept for a minimum of 6 years.

5 Emission Limits, Monitoring and Other Provisions

5.1 Emissions monitoring

5.1.1 Emissions of the substances listed in Table 5.1 should where relevant be controlled. The emission limit values and provisions described in this section are achievable using the best available techniques described in Section 4.

5.1.2 Monitoring of emissions should be carried out according to the method specified in Table 5.1 or paragraph 5.1.3 or by an equivalent method agreed by the regulator. Where reference is made to a British, European, or International standard (BS, CEN or ISO) in this section, the standards referred to are correct at the date of publication.

Table 5.1 emission monitoring standards.

Substance / Parameter	Standard ([1])
Carbon monoxide	EN 15058
Dust	EN 13284-1
Oxides of Nitrogen (NO and NO_2, expressed as NO_2)	EN 14792
Total Volatile Organic Compounds	EN 12619
Hydrogen Cyanide	US EPA OTM29
Formaldehyde	A modified version of US EPA Method 316 is the preferred method for measuring formaldehyde. However, for practical reasons (e.g. on very small ducts), it may be acceptable to measure formaldehyde using a method based on BS CEN/TS 13649. A CEN standard is near to publication.
Smoke	Ringlemann scale – BS 2742:2009 (Operator assessment)
([1]) The standards referred to are correct at the date of publication. (Users of this note should bear in mind that the standards are periodically amended, updated or replaced. The latest information regarding the monitoring standards applicable can be found at the Source Testing Association website. Further information on monitoring can be found in Environment Agency publications (M1) and (M2).	

5.1.3 During each measurement, the plant shall be operating under stable conditions at a representative even load. In this context, start-up and shut-down periods shall be excluded.

5.1.4 For newly permitted plant, the first measurements shall be carried out within four months of the grant of a permit or of the date of the start of the operation, whichever is the latest.

5.1.5 When the regulator determines that continuous measurements are required the relevant EN standards are EN 15267-1, -2 & -3 and EN 14181 which are applicable to all parameters.

In determining whether more frequent monitoring than that set out in tables 5.2 to 5.5 or continuous monitoring is required. The regulator should have regard to the following factors:

- the level of risk to local air quality or other sensitive receptors;
- variability in operating conditions, e.g. waste types and feed rate;
- absence of secondary dust abatement or reliance on cyclones.

In the case of continuous measurements, the automated measuring systems shall be subject to checking by means of parallel measurements with the relevant reference methods at least once per year and the operator shall inform the regulator about the results of those checks.

5.1.7 Whether sampling on a continuous or non-continuous basis care is needed in the design and location of sampling systems in order to obtain representative samples for all release points.

- Sampling points on new plant should be designed to comply with the British or equivalent standards, see paragraph above.
- The operator should ensure that relevant stacks or ducts are fitted with facilities for sampling which allow compliance with the sampling standards.

5.2 Emission limit values

5.2.1 All activities should comply with the emission limits and provisions with regard to releases in Table 5.2 to Table 5.5.

5.2.2 Unless stated otherwise, emission limit values (ELVs) for emissions to air refer to values of concentration, expressed as mass of emitted substance per volume of waste gas under standard conditions (dry gas at a temperature of 273.15 K, a pressure of 101.3 kPa, and an oxygen concentration of 6 vol-%), and expressed in the unit mg/Nm^3.

5.2.3 Unless stated otherwise, the averaging periods associated with the ELVs for emissions to air are defined, for periodic monitoring, as the average over the sampling period i.e. the average of three consecutive measurements of at least 30 minutes each.

Table 5.2 Emission limit values for plants with a maximum burn rate of 50kg/hr or more, but less 90kg/hr

Substance/ Parameter	Emission Limit Value	Type of plant	Minimum monitoring frequency
Smoke	Ringlemann Shade 1	All Plant	Daily when in operation

Table 5.3 Emission limit values for plants with a maximum burn rate of 90kg/hr or more, but with a rated thermal input of less than 1 MW

Substance/ Parameter	Emission Limit Value (mg/Nm^3)	Type of plant	Minimum monitoring frequency
Carbon Monoxide	375	All plant	Annual Extractive
Dust	90	All Plant	Annual Extractive
Oxides of Nitrogen	600	All Plant	Annual Extractive
TVOC	30	All Plant	Annual Extractive
HCN (1)	7.5	All Plant	Annual Extractive
Formaldehyde (2)	7.5	All Plant	Annual Extractive
Smoke	Ringlemann Shade 1	All Plant	Daily when in operation
(1) Only applicable when melamine faced woods are in the fuel. (2) Only applicable when plywood, chipboard and fibreboard woods are in the fuel.			

Table 5.4 Emission limits values for plants with a rated thermal input of 1 MW or more, but less 5 MW

Substance/ Parameter	Emission Limit Value (mg/Nm^3)	Type of plant	Minimum monitoring frequency
Carbon Monoxide	225	All plant	Annual Extractive
Dust	90	Existing plant until 31st December 2029 (1)	Annual Extractive
	50	New plant and existing plant form 1st January 2030 (2)	Annual Extractive
Oxides of Nitrogen	600	Existing plant	Annual Extractive
	500	New Plant	Annual Extractive
TVOC	30	All Plant	Annual Extractive
HCN (3)	7.5	All Plant	Annual Extractive
Formaldehyde (4)	7.5	All Plant	Annual Extractive
Smoke	Ringlemann Shade 1	All Plant	Daily when in operation
(1) Existing plant – means a combustion plant put into operator before 20th December 2018. (2) New plant – means a combustion plant put into operation after 19th December 2018. (3) Only applicable when melamine faced woods are in the fuel. (4) Only applicable when plywood, chipboard and fibreboard woods are in the fuel.			

Table 5.5 Emission limits values for plants with a rated thermal input of 5 MW or more, but with a maximum burn rate of less than 3T/hr

Substance/ Parameter	Emission Limit Value (mg/Nm^3)	Type of plant	Minimum monitoring frequency
Carbon Monoxide	225	All plant	Annual Extractive
Dust	90	Existing plant until 31st December 2024 ([1])	Annual Extractive
	30	New plant and existing plant form 1st January 2025 ([2])	Annual Extractive
Oxides of Nitrogen	600	Existing plant	Annual Extractive
	300	New Plant	Annual Extractive
TVOC	30	All Plant	Annual Extractive
HCN ([3])	7.5	All Plant	Annual Extractive
Formaldehyde ([4])	7.5	All Plant	Annual Extractive
Smoke	Ringlemann Shade 1	All Plant	Daily when in operation

([1]) Existing plant – means a combustion plant put into operator before 20th December 2018.
([2]) New plant – means a combustion plant put into operation after 19th December 2018.
([3]) Only applicable when melamine faced woods are in the fuel.
([4]) Only applicable when plywood, chipboard and fibreboard woods are in the fuel.

5.3 Compliance with emission limit values

5.3.1 The emission limits values given in table 5.2 to 5.5 apply during normal operating conditions, i.e. excluding start-up and shut down, but including incinerators / combustion plant operating at part load. Emission limit values should be met from the point when waste wood is first introduced into the process. Except that emissions shall be free of dark smoke at all times when the plant is in operation.

5.3.2 In the case of periodic measurements, the emission limit values referred to in Tables 5.2 to 5.5 shall be regarded as having been complied with if the results of each of the measurements or of the other procedures do not exceed the relevant emission limit value.

5.3.3 In the case of continuous measurements on medium combustion plants as described in paragraph 2.10 (see also tables 5.4 and 5.5), the emission limit values shall be regarded as having been complied with if the evaluation of the measurement results indicates, for operating hours within a calendar year, that all of the following conditions have been met:

(a) no validated monthly average value exceeds the relevant emission limit values;

(b) no validated daily average value exceeds 110 % of the relevant emission limit values;

(c) 95 % of all the validated hourly average values over the year do not exceed 200 % of the relevant emission limit values.

5.3.4 The validated hourly and daily average values shall be determined from the measured valid hourly average values after having subtracted the value of the confidence interval specified below.

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

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

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

5.4 Other than normal operating conditions

5.4.1 Higher emissions may occur during start-up and shut-down of a process. These emissions can be reduced, by minimising, where possible, the number of start-up and shut-downs and having adequate procedures in place for start-up, shut-down and emergency shut-downs.

5.5 Reporting and Notifications

5.5.1 Communication between the operator and the regulator is essential for an effectively regulated installation.

5.5.2 Where an operator undertakes periodic emissions monitoring, the operator should notify the regulator, sufficiently in advance, of the monitoring exercise taking place to allow the regulator to witness the testing.

5.5.3 Subsequently the operator should submit the results of any periodic emission testing to the regulator once they have received the results. This submission should be within a timescale and format agreed with the regulator.

Notwithstanding the requirements of paragraph 5.5.5, where an operator undertakes continuous emissions monitoring, the operator should report all results (including the results of parallel measurements using the relevant reference method) at least annually, or more frequently if required by the regulator. This submission should be within a timescale and format agreed with the regulator.

5.5.4 Where monitoring is not in accordance with the main procedural requirements of the relevant standard, deviations should be reported as well as an estimation of the error involved.

5.5.5 In the event of any non-compliance with any emission limit value, or malfunctions and breakdown of the plant that leads to abnormal operating conditions or complaints about odour and / or smoke; the operator shall take the measures necessary to ensure that compliance is restored within the shortest possible time. This action should include but is not limited to:

a) Notify the regulator within 24 hours of receiving the information to agree the investigation of the issue.
b) Undertake the agreed investigation.
c) Adjust the process or activity to minimise those emissions.
d) If applicable re-test to demonstrate compliance as soon as possible.
e) Promptly record the events and actions taken.
f) Submit to the regulator the report and updates as agreed.

5.5.6 The operator should inform the regulator, without undue delay, of any proposed changes to the plant which could affect the applicable emission limit values. This notification should be sufficiently in advance of those changes coming into effect for the regulator to make the necessary assessments with a view to varying the permit as appropriate.