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**Chirk Particleboard
Factory**



Kronospan

Waste Incineration BREF Review

Document approval

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This report has been produced using information provided the Kronospan. Kronospan has also reviewed and agree with the commitments made within.

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1 Introduction

Natural Resources Wales (NRW) issued Kronospan Limited (Kronospan) with a notice to provide additional information under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a "Regulation 61 Notice") with regard the Chirk Particleboard Factory, Holyhead Road, Chirk (the Facility).

This Regulation 61 Notice was in relation to the publication of the revised Best Available Techniques (BAT) Reference Document (BREF) for Waste Incineration (the WI BREF) and associated BAT conclusions which were published on 03 December 2019.

NRW requested that this response considers all parts of the installation to which the WI BREF conclusions apply (or may apply). This includes all plant burning any type of waste, including wood which may be classified as waste, including the following:

- *"K8 biomass boiler (plant is subject to IED Ch IV and considered currently by NRW directly in scope of the WI BAT conclusions).*
- *K7 biomass boiler (plant is not subject to IED Ch IV and considered currently by NRW that while the plant may not be directly in scope of the BAT conclusions, that they are likely to be relevant, noting that the process has not been identified as being within the scope of any other BAT conclusions).*
- *Chip Dryer No.4, fired on natural gas and wood dust, and discharged via WESP 21 and A32 [or A33 in abnormal operation] (currently IED Ch IV is not applied and owing to lack of information available to NRW on wood burned and other factors, considered that the plant may be either subject to IED Chapter IV or not, and hence directly in scope of the BAT conclusions or they are likely to be relevant, noting that the release is in any case subject to the wood-based panels BATc and BAT-AEL).*
- *Any other emission points for waste gases arising from combustion of waste, or material which could be considered to be waste (including waste internally arising within the manufacturing process)."*

Within the Regulation 61 Notice, NRW has requested a response to an additional 12 questions relating to the assessment of the plants against the relevant BAT conclusions.

The purpose of this report (and supporting appendices) is to provide a full review of the requirements of the WI BREF and associated BAT conclusions for the Facility and summarise how the plant which this applies to will comply with each of the BAT conclusions.

NRW Returns Summary spreadsheet has been populated for the relevant plant and is provided in Appendix A. The responses to the additional questions required by NRW are contained below in subsequent sections of this report.

2 Legislative context

2.1.1 The Industrial Emissions Directive

The Industrial Emissions Directive 2010/75/EU (IED), which was adopted on 07 January 2013, is the key European Directive which covers almost all regulation of industrial processes in the EU and the UK. Within the IED, the requirements of the relevant sector BREF become binding as BAT guidance, as follows.

1. Article 15, paragraph 2, of the IED requires that emission limit values are based on best available techniques, referred to as BAT.
2. Article 13 of the IED, requires that ‘the Commission’ develops BAT guidance documents (referred to as BREF’s).
3. Article 21, paragraph 3, of the IED, requires that when updated BAT conclusions are published, the Competent Authority has up to four years to revise permits for facilities covered by that activity to comply with the requirements of the sector specific BREF.

It is understood that the current BREF review process is being undertaken by NRW to implement the relevant requirements of the IED.

Article 3 (31) of the IED defines biomass as:

a) products consisting of any vegetable matter from agriculture or forestry which can be used as a fuel for the purpose of recovering its energy content;

(b) the following waste:

(i) vegetable waste from agriculture and forestry;

(ii) vegetable waste from the food processing industry,

if the heat generated is recovered;

(iii) fibrous vegetable waste from virgin pulp production and from production of paper from pulp, if it is co-incinerated at the place of production and the heat generated is recovered;

(iv) cork 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 coating and which includes, in particular, such wood waste originating from construction and demolition waste;

Article 28 of the IED states:

This Chapter [Chapter III – Special Provisions for Combustion Plants] shall apply to the combustion plants, the total rated thermal input of which is equal to or greater than 50 MW, irrespective of the fuel type.

Therefore, combustion plants which have a thermal capacity of < 50MWth, are excluded from complying with the requirements of Chapter III of the IED.

Article 42 (2) of the IED states:

This Chapter [Chapter IV – Special Provisions for Waste Incineration and Waste Co-incineration Plants] shall not apply to the following plants:

(a) plants treating only the following wastes:

(i) waste listed in point (b) of point 31 of Article 3;

Therefore, plants which combust exempt biomass fuels are excluded from complying with the requirements of Chapter IV of the IED.

2.1.2 Waste Incineration BREF

The WI BREF was published by the European Integrated Pollution Prevention and Control (IPPC) Bureau in December 2019. Therefore, in accordance with the requirements of the IED, the regulatory authority (NRW) is required to review and implement conditions within all permits which require operators to comply with the requirements set out in the BREF within 4 years of it being published (i.e. by December 2023).

The 'Scope' section of the WI BREF states:

This BREF does not address the following:

- *Pre-treatment of waste prior to incineration. This may be covered by the BREF for Waste Treatment (WT).*
- *Treatment of incineration fly ashes and other residues resulting from flue-gas cleaning (FGC). This may be covered by the BREF for Waste Treatment (WT).*
- *Incineration or co-incineration of exclusively gaseous waste other than that resulting from the thermal treatment of waste.*
- *Treatment of waste in plants covered by Article 42(2) of Directive 2010/75/EU.*

Therefore, as per the requirements of Article 42 (2) of the IED, refer to section 2.1.1, plants which combust exempt biomass fuels are excluded from complying with the requirements of WI BREF.

2.1.3 Large Combustion Plant BREF

The Large Combustion Plant (LCP) BREF was published by the European IPPC Bureau in December 2017. Therefore, in accordance with the requirements of the IED, the regulatory authority (NRW) is required to review and implement conditions within all permits which require operators to comply with the requirements set out in the BREF within 4 years of it being published (i.e. by December 2021).

The 'Scope' section of the LCP BREF states:

This BREF for Large Combustion Plants concerns the following activities specified in Annex I to Directive 2010/75/EU:

1.1: Combustion of fuels in installations with a total rated thermal input of 50 MW or more, only when this activity takes place in combustion plants with a total rated thermal input of 50 MW or more.

1.4: Gasification of coal or other fuels in installations with a total rated thermal input of 20 MW or more, only when this activity is directly associated to a combustion plant.

5.2: Disposal or recovery of waste in waste co-incineration plants for non-hazardous waste with a capacity exceeding 3 tonnes per hour or for hazardous waste with a capacity exceeding 10 tonnes per day, only when this activity takes place in combustion plants covered under 1.1 above.

Therefore, plants which satisfy any of the following criteria are excluded from complying with the requirements of the LCP BREF:

- a thermal capacity of <50MWth;

- gasification with a thermal capacity of >20MWth; or
- disposal or recovery of waste in a waste co-incineration plant with a capacity of > 3 tonnes per hour.

2.1.4 Medium Combustion Plant Directive

Article 2 (1) of the Medium Combustion Plant Directive (MCPD) states:

This Directive shall apply to combustion plants with a rated thermal input equal to or greater than 1 MW and less than 50 MW ('medium combustion plants'), irrespective of the type of fuel they use.

Article 2 (2) of the MCPD states:

This Directive shall not apply to:

(a) combustion plants covered by Chapter III or Chapter IV of Directive 2010/75/EU...

(d) combustion plants which the gaseous products of combustion are used for the direct heating, drying or any other treatment of objects of materials.

Finally, Article 3 of the MCPD includes the following definitions:

'combustion plant' means any technical apparatus in which fuels are oxidised in order to use the heat thus generated;

'biomass' means any of the following:

a) products consisting of any vegetable matter from agriculture or forestry which can be used as a fuel for the purpose of recovering its energy content;

(b) the following waste:

(i) vegetable waste from agriculture and forestry;

(ii) vegetable waste from the food processing industry, if the heat generated is recovered;

(iii) fibrous vegetable waste from virgin pulp production and from production of paper from pulp, if it is co-incinerated at the place of production and the heat generated is recovered;

(iv) cork 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 coating and which includes, in particular, such wood waste originating from construction and demolition waste;

It should be noted that the definition of 'biomass' within the MCPD is the same as stated in the IED, refer to section 2.1.1.

3 Review legislative context

A review of each combustion plant against the legislative context set out in section 2 has been undertaken as follows:

- Chip Dryer No.4 (section 3.1);
- K8 Biomass Plant (section 3.2); and
- K7 Biomass Plant (section 3.3).

To support this review a summary of the fuels used in each plant is provided in Appendix B.

3.1 Chip Dryer No.4

Chip Dryer No 4 is a direct heat drier, and combusts a mixture of natural gas and dust. Natural gas is used to fire the supplementary burner, which is used to supplement the drying process. The dust used is sourced from the dust extraction system at the Facility.

The dust combusted in Chip Dryer No 4 is sourced from dust extraction systems from the surface sanding of boards (MDF and PB). The PB surface layer only contains sawdust and MDF fibres, i.e. not RCT (recycled timber). In accordance with the Wood Recyclers Association (WRA) Grades of Waste Wood¹ (the WRA Guidance) this is classified as “pre-consumer waste wood”. The WRA Guidance states that “*although this is waste as defined by the waste regulations, this does not require an IED Chapter IV installation and should not contain any treated or low-grade material*”. The footnote to the table states:

“Pre-consumer waste wood is waste wood material created during the manufacturing process of virgin wood, not involving the application of treatments, e.g. offcuts or trimmings from virgin/sawn timber. It is also waste wood material created during the manufacturing process of raw, untreated board products such as panel board, MDF and plywood (for clarity, this waste wood can only be used/burnt at source). Waste from joinery activity using these untreated wood materials is also included in this definition.”

The design capacity of the chip dryer and annual fuel consumption is presented in Table 1.

Table 1: Chip dryer no.4 design and fuel consumption data

Item	Units	Value
Design capacity	MWth	45
Design capacity	t/hr	9.3
Fuel consumption - regular operation		
Dust throughput (EWC code 03 01 05)	t/yr	27,964
Natural gas usage	m ³ /yr	766,255

In line with the WRA the combustion of dusts from the manufacturing process does not need to be processed in an Industrial Emissions Directive (IED) Chapter IV installation, and therefore, it is exempt from the regulation under the IED and the requirements of the WI BAT conclusions.

Although the design capacity of the Chip Dryer No. 4 is less than 50 MWth, this is a direct heat dryer where the products for combustion are used for direct heating. As such the MCPD does not apply.

¹ A copy of this is provided in Appendix A

Therefore, it is considered that the most appropriate BREF for this plant is that for the production of wood-based panels. Kronospan has separately demonstrated compliance with the production of wood-based panel BREF when applying for an EP for Chip Dryer No.4 within the 2018 EP variation.

3.2 K8 Biomass Plant

As set out in Appendix B, the K8 Biomass Plant is fuelled by a mixture of virgin biomass, exempt biomass and non-exempt biomass.

Kronospan notes that NRW consider this to be directly in scope of the WI BAT conclusions. However, as per the requirements of Article 42 (2) of the IED (quoted in Section 2.1.1), plants which combust exempt biomass fuels are excluded from complying with the requirements of WI BAT conclusions. Furthermore, as the plant has a thermal input of less than 50 MW neither do the requirements of the LCP BAT conclusions apply.

However, as the plant is classified as a co-incinerator and combusts a fuel mix of exempt and non-exempt biomass is regulated under Chapter IV of the IED, the most appropriate BAT conclusions to apply is the WI BAT conclusions. It is noted that this is not directly applicable as the fuel mix includes exempt biomass, i.e. non-waste fuels.

3.3 K7 Biomass Plant

The K7 Biomass Boiler is a direct heating unit with a design thermal fuel input capacity of 38 MW. The boiler is primarily used to heat a thermal oil system which supplies heat to the board manufacturing presses (MDF1, MDF2 and Particleboard) and the Melamine-Facing and Paper Impregnation departments through a common manifold. If required, the K7 boiler can also be utilised to supply steam to the MDF manufacturing process. For the current operations, the K7 steam generation is maintained on standby and produces up to 20 tonnes/hr of steam which is supplied to the MDF manufacturing process to provide heat to the thermal oil system. The exhaust gases from the K7 Biomass Boiler are subsequently ducted to the dryer to utilise the heat within the flue gases. Kronospan monitors the thermal output of the K7 Biomass Plant and the percentage of the output that is used to heat the thermal oil system. This demonstrates that the 'primary use' of the K7 Biomass Plant is for heating the oil.

As set out in Appendix B, only virgin and exempt biomass is combusted as a fuel within the K7 Biomass Plant, i.e. the fuels combusted are not derived from waste.

Kronospan notes that NRW consider this to be indirectly in scope of the WI BAT conclusions. However, as per the requirements of Article 42 (2) of the IED (quoted in Section 2.1.1), plants which combust exempt biomass fuels are excluded from complying with the requirements of WI BAT conclusions. In addition, as the plant has a thermal input of less than 50 MW the requirements of the LCP BAT conclusions are also not applicable.

The design capacity of the K7 Biomass Plant is 38 MW and as explained above its primary use is to heat a thermal oil system to supply heat to the board manufacturing presses. As the primary use is to heat oil it is considered that this is within the scope of the MCPD. As the K7 Biomass Plant has been operating prior to the MCPD being implemented into UK legislation. Kronospan considers that it should be classified as an "existing plant" for MCPD purposes.

A review of the operation of the K7 Biomass Plant against the requirements of the MCPD has been included within Section 3.3.

4 Questions

Within the Regulation 61 Notice NRW has requested the following:

For Chip Dryer No. 4 only, answer questions 1 and 2 below to provide / confirm the following preliminary information relating to the combustion plant, so that we can ensure the correct regulations are applied (Industrial Emissions provisions) as well as any WI BATc:

- 1. Provide a summary of the plant capacity (MWth and tonnes per hour/annum), fuels used (wood and wood products, including waste; natural gas, and any other supplementary/backups fuels), and the approximate quantities of each used (in MWth for all fuels, and tonnes per hour and maximum throughput per annum of wood/waste). If different powers or fuel proportions are used in regular operation and startup/shutdown (etc.) described accordingly***
- 2. Provide a summary of the waste fuels utilised, their origins, EWC code, and assessment of whether or not their combustion is exempt from regulation under Chapter IV of the Industrial Emissions Directive under Article 3(31)b definition of Biomass. (Notting your response on 08/11/19, including "Boiler fuel Creation procedure" KC/LOGY/PRO/0008 dated 20/08/2019 concerning K7 and K8 – comparable information for solid fuels used in the chip dryer No4 and including EWCs will satisfy this request.***

A response to questions 1 and 2 is provided in Section 3.1. As shown, the Chip Dryer No. 4 is exempt from the regulation under the IED and the requirements of the WI BAT conclusions.

For each plant / process burning any waste - for each BAT conclusion, where relevant, and its individual sub-elements contained within the BAT conclusions document, answer question 3 below:

- 3. Confirm whether or not you consider that the Waste Incineration BAT Conclusions, including associated emission, performance and energy efficiency levels, are directly applicable, indirectly relevant, or not applicable to the plant or process. Noting the guidance provided in the covering letter on our approach to applicability. If you consider that other BATc are relevant to the plant or process (except Wood Panels BREF), indicate this in your response and provide a review of conformance with the BATc.**

For plant / processes which are in the scope of the WI BAT conclusion(s), (therefore directly applicable), respond fully to questions 4-7 below:

- 4. Confirm whether or not you currently comply with the requirements of the BAT Conclusion, including any associated emission, performance or energy efficiency levels, providing a description of the techniques in place and how they meet the standard**
- 5. If you do not comply with the BAT conclusion, describe how and by when you intend to meet the standard before the 3 December 2023, being the date which, hereafter in this Notice, is referred to as the 'compliance date'.**
- 6. Confirm if you intend to continue operating in a manner which would not comply with the relevant new BAT Conclusion after the compliance date, what your justification for being allowed to do so is, and by what date you intend to come into full compliance, or a description of alternative measures to be adopted that will provide equivalent environmental protection.**
- 7. Where the BAT conclusion has a BAT Associated Emission Level (BAT-AEL) specified, with which you will not comply by the compliance date you should consider requesting a**

derogation. To do this you must provide sufficient technical and commercial information to demonstrate that achieving that BAT-AEL would lead to costs that are disproportionately high, compared with environmental benefits due to one or more of:

- a. the geographical location of your installation;
- b. the local environmental conditions around your installation;
- c. the technical characteristics of your installation.

No other justification for a derogation can be considered.

For plant/processes which are not in the scope of the WI BAT conclusions(s), but to which they may be indirectly relevant in determining BAT, respond fully to questions 8-10 below:

8. Confirm whether or not you consider the individual BAT conclusion applicable to the plant/process, and if applicable, indicate whether or not you currently comply with the requirements of the BAT Conclusion, including any associated emission, performance or energy efficiency levels, providing a description of the techniques in place and how they meet the standard if applicable.
9. If you do not comply with the BAT conclusion but consider that it is indirectly applicable, describe the standard you propose to meet, with a date for compliance. If you consider that an alternative standard (e.g. emission limit value outside of the WI BATAEL range) should be permanently applied to the plant / process, then this should be fully justified in your response.
10. Confirm if you intend to continue operating in a manner which would not comply with the relevant new BAT Conclusion or your proposed alternative standard, after the compliance date of 03 December 2023. If so, explain, what your justification for being allowed to do so is, and by what date you intend to come into full compliance, or a description of alternative measures to be adopted that will provide equivalent environmental protection.

For plant / processes for which you consider the WI BATc are not relevant, respond fully to questions 11-12 below:

11. Provide an appropriate level of justification for this conclusion that the WI BATc are not relevant with reference to the BATc scope and relevant plant operating characteristics (e.g. the nature of wood combusted, plant throughput, proportion of fuel that is waste)
12. Confirm which BATc(s) or other regulatory guidance are used / proposed to determine BAT for the plant / process.

As set out in section 3, none of the plant on site burn waste, and it is not considered that the WI BAT conclusions are directly relevant to any of the sources on site. Therefore, a response against questions 3 to 7 is not required.

For the K8 Biomass Plant it is considered that the WI BAT conclusions are **indirectly relevant** and as such questions 8 to 10 have been answered in relation to the K8 Biomass Plant.

For the K7 Biomass Plant and Chip Dryer No.4 it is considered that the WI BAT conclusions are **not relevant** and as such a response to questions 11 and 12 have been provided for the K7 Biomass Plant and Chip Dryer No.4.

K8 Biomass Plant

It is considered that the WI BAT conclusions are **indirectly relevant**. NRW's WI BAT Returns Summary spreadsheet has been completed for the K8 Biomass Plant and provided within the submission and Appendix C.

As shown, the only BAT conclusions which compliance cannot be directly confirmed at the time of collating this submission point is BAT 4, BAT 18, BAT 25, BAT 28 to 31 and BAT 37. Table 2 provides a summary of the WI BAT conclusions which cannot currently be complied with; the standard proposed to be met; and the date for compliance.

Table 2: Summary of BAT which cannot be complied with - K8 Biomass Plant

BAT Conclusion	Response
BAT 4	<p>Continuous emissions monitoring is installed at the Facility for monitoring NO_x, NH₃, CO, SO₂, HCl, N₂O and TOC. The CEMS holds MCERTS-certification for all species monitored.</p> <p>Periodic monitoring is completed four times a year for heavy metals, mercury, HF, dioxins and furans, dioxin-like PCBs and PAHs including benzo[a]pyrene.</p> <p>The WI BREF allows for periodic monitoring of dioxins and furans where emissions are demonstrated to be sufficiently low and stable. To date, all of the measured dioxins and furans concentrations have been below the permit values. Therefore, Kronospan conclude that continuous monitoring system for dioxins and furans is not required.</p> <p>The WI BREF allows for periodic monitoring of mercury and dioxins and furans where emissions are demonstrated to be sufficiently low and stable.</p> <p>To date, mercury emissions have been below the limits in the EP. However, Kronospan are in the process of determining whether the concentrations are sufficiently low and stable (see additional commentary below this table).</p>
BAT 18	<p>Kronospan understands that the Environment Agency has published draft guidance on Other Than Normal Operating Conditions (OTNOC) Management Plans, and at the time of collating this report it is consulting with the waste management industry on its proposals for OTNOC Management Plans. In the draft guidance, the Environment Agency has indicated that it will aim to finalise the guidance by the end of October, and it will not be requesting OTNOC Management Plans from Operators, or auditing them before 1 April 2024.</p> <p>Therefore, Kronospan proposes to develop an OTNOC Management Plan which will be included within the EMS by April 2024. This date is in line with the requirements within England and is considered appropriate given that NRW will be adopting the Environment Agency guidance.</p>
BAT 25	<p>The K8 Biomass Plant is compliant in that it uses an appropriate combination of the techniques to reduce emissions of dust, metals and metalloids, including bag filters and dry sorbent (activated carbon) injection, and the plant demonstrates compliance with BAT 4 (monitoring).</p> <p>Continuous monitoring of PM and extractive sampling of metals has shown that the plant complies with the existing ELVs in the EP.</p> <p>Emissions of dust and Cd and Tl have been below the upper end of the BAT-AEL range and as such the plant currently demonstrates compliance with the WI BAT conclusions for these substances.</p> <p>Extractive sampling of metals has shown that concentrations are between 0.3 and 0.5 mg/Nm³. The upper end of the BAT-AEL range is 0.3 mg/Nm³. Therefore, the plant does not currently comply with the BAT conclusion. However, Kronospan is trialling increasing the dosing of activated carbon to reduce the</p>

BAT Conclusion	Response
	concentration of metals in the flue gases (see additional commentary below this table).
BAT 28	<p>The K8 Biomass Plant is compliant in that it uses an appropriate combination of the techniques to reduce HCl, HF and SO₂ emissions, including continuous HCl and SO₂ monitoring downstream of the FGC systems, and the plant demonstrates compliance with BAT 4 (monitoring).</p> <p>Continuous monitoring of HCl and SO₂ and extractive sampling of HF has shown that the plant complies with the existing ELVs in the EP.</p> <p>Extractive monitoring results of HF have been below the BAT-AEL and as such the plant currently demonstrates compliance with the WI BAT conclusions for HF.</p> <p>Continuous monitoring of HCl and SO₂ has shown that concentrations are above the upper end of the BAT-AEL range. Therefore, the plant does not currently comply with the BAT conclusion. However, Kronospan is trialling increasing the dosing of lime to reduce the concentration of acid gases in the flue gases and investigating whether a HCl probe upstream of the FGC system can be installed to optimise the dosing system (see additional commentary below this table).</p>
BAT 29	<p>The K8 Biomass Plant is compliant in that it uses an appropriate combination of the techniques to reduce NO_x emissions whilst also limiting emissions of CO and N₂O, including optimisation of the incineration process and an SNCR system, and the plant demonstrates compliance with BAT 4 (monitoring).</p> <p>Continuous monitoring of NO_x, and CO has shown that the plant complies with the existing ELVs in the EP. There is not currently an ELV for NH₃.</p> <p>Continuous monitoring results of CO have been below the BAT-AEL and as such the plant currently demonstrates compliance with the WI BAT conclusions for CO.</p> <p>Continuous monitoring of NO_x and NH₃ has shown that concentrations are above the upper end of the BAT-AEL range. Therefore, the plant does not currently comply with the BAT conclusion. However, Kronospan is trialling increasing the dosing of urea to reduce the concentration of NO_x in the flue gases and optimising the dosing system (see additional commentary below this table).</p>
BAT 30	<p>The K8 Biomass Plant is compliant in that it uses an appropriate combination of the techniques to reduce VOCs, PCDD/F (dioxins) and PCBs, including bag filters and dry sorbent (activated carbon) injection, and the plant demonstrates compliance with BAT 4 (monitoring).</p> <p>Continuous monitoring of VOCs and extractive monitoring of PCDD/F has shown that the plant complies with the existing ELVs in the EP. There is not currently an ELV for PCBs.</p> <p>The existing ELV for VOCs is the same as the upper end of the BAT-AEL range. As such the plant can currently demonstrate compliance with the WI BAT conclusions for VOCs.</p> <p>Extractive sampling of dioxins has shown that concentrations are generally below the upper end of the BAT-AEL range with one sample at 0.08 ng/Nm³. Kronospan is trialling increasing the dosing of activated carbon to reduce the concentration of dioxins in the flue gases (see additional commentary below this table).</p>

BAT Conclusion	Response
BAT 31	<p>The K8 Biomass Plant is compliant in that it uses dry sorbent injections to reduce emissions of mercury and the plant demonstrates compliance with BAT 4 (monitoring).</p> <p>Kronospan has committed to carrying out the monitoring to demonstrate that the emissions of mercury and low and stable (see additional commentary below this table).</p>

As identified in Table 2, although the K8 Biomass Plant includes the appropriate control measures, the BAT-AELs for the following pollutants are not currently achieved:

- Metals (BAT 25);
- HCl and SO₂ (BAT 28)
- NO_x and NH₃ (BAT 29)
- Dioxins and furans (BAT 30); and
- Mercury (BAT 31).

As Kronospan has only been informed formally that it will potentially be required to comply with the WI BREF when the Regulation 61 Notice was issued, it was not aware that these emission limits would potentially be applied. Kronospan is currently undertaking trials to investigate measures to reduce these emissions to comply with the BAT-AELs including:

- Optimising the dosing levels of lime (for HCl and SO₂ abatement);
- Optimising the dosing levels of activated carbon (for total metals, mercury and dioxins and furans abatement);
- Optimising the combustion conditions (for NO_x abatement); and
- Optimising the urea dosing within the SNCR system (for NO_x abatement).

Whilst undertaking the trials, Kronospan proposes to provide quarterly updates to NRW on the progress and the results from the trials with the intention of implementing any changes/modifications to the K8 Biomass Plant to demonstrate compliance with the BAT-AELs by the end of November 2024.

In addition, Kronospan has instructed that monitoring of mercury emissions is carried out in line with the UK WI BAT Conclusions interpretation document to demonstrate that emissions are '*low and stable*'. The monitoring has been scheduled to be undertaken twice per month in accordance with the NRW's BREF Implementation guidance and will be undertaken between November 2023 and January 2024. It is assumed that the results from the monitoring would be available by the end of March 2024, and demonstrate that emissions are low and stable. However, if this cannot be demonstrated additional testing will be carried out and the feasibility of a CEMS for mercury monitoring considered. It is proposed to be able to provide NRW with a response by the end of November 2024.

K7 Biomass Plant

A detailed justification of why the WI BAT conclusions are not relevant to the K7 Biomass Plant is provided in Section 3.3. This concludes that this is directly in scope of the MCPD, and that the plant should be considered an "*existing plant*".

The following section details the requirements of the MCPD and whether compliance can be demonstrated for the K7 Biomass Plant.

The key requirements of the MCPD for the Operator include:

- Provision of information to the competent authority;
- Compliance with emission limits; and
- Monitoring of emissions with emission limits and carbon monoxide (CO).

Annex I of the MCPD requires the information for the medium combustion plant as set out in Table 3:

Table 3: MCPD information required

Information required	Response
Rated thermal input (MW)	38 MW
Type of MCP	Biomass plant
Type and share of fuels used	As set out in Appendix B
Date of the start of operation, or proof that the operation started before 20 December 2018	August 2003
Sector of activity of the MCP or the facility in which it is applied (NACE code)	C16.2.1 – Manufacture of veneer sheets and wood-based panels
Expected number of annual operating hours and average load in use	8,000
Name of the registered office of the operator and the address where the plant is located.	Kronospan, Maesgwyn Farm, Wrexham LL14 5NT – plant also located here

Annex II Part I sets out the emission limits for existing medium combustion plants. The emission limits for existing medium combustion plants with a rated thermal input greater than 5 MW, fuelled by solid biomass are set out in Table 4.

Table 4: Emission limits to air - MCPD - Existing Biomass Plant

Pollutants	Emission limit value (mg/Nm ³)
SO ₂	200
NO _x	650
Dust	30
<p><i>Note:</i> Emissions expressed at 273.15K, 101.3 kPa, dry and 6% oxygen content. These apply from 01 January 2025 – Article 6(2). A limit for sulphur dioxide is contained within the MCP but this does not apply in the case of plants firing exclusively woody solid biomass like the plant so is not being proposed.</p>	

Kronospan can confirm that quarterly extractive monitoring of SO₂, NO_x, CO and PM is carried out for emissions from the K7 Biomass Plant in the duct prior to the MDF dryer as a requirement of the EP. Therefore, the monitoring requirements of the MCPD are currently being achieved. This monitoring shows that the ELV within the MCPD for dust and SO₂ (although not directly applicable as the plant fires exclusively woody solid biomass) is currently achieved. Kronospan is in the process of reviewing the operation of the K7 Biomass Plant and looking at optimising the combustion

process to reduce emissions of NO_x in order to achieve the ELV by 01 January 2025 in line with the requirement of the MCPD. In the meantime, it is noted that these exhaust gases are used within the dryer and there is an ELV for NO_x from the dryer which is 100 mg/Nm³ (dry, 273K, 101.3 kPa, with no correction for oxygen). This is below the upper end of the BAT-AEL from the wood-panel manufacturing BAT conclusions. Kronospan demonstrate compliance with this ELV.

Chip Dryer No. 4

A response to questions 11 and 12 for the Chip Dryer No. 4 is provided in Section 2 and Section 3.1. As detailed, the BREF for the production of wood-based panels is considered to be most relevant to the Chip Dryer No. 4. Kronospan has separately demonstrated compliance with the production of wood-based panel BREF when applying for an EP for Chip Dryer No.4 within the 2018 EP variation.

A Wood Recyclers Association – Grades of Waste Wood



WRA Grades of Waste Wood

GRADE	Typical Markets	Typical Sources of raw material for recycling and/or recovery	Typical Materials	Typical non-wood content prior to processing	Notes
Grade A Pre-Consumer Waste Wood (*1) and untreated wooden packaging = Clean untreated	A feedstock for the manufacture of professional and consumer products such as animal bedding, equine and landscaping surfacing. May also be used as a fuel in domestic and non-IED Chapter IV biomass installations and for the manufacture of pellets and briquettes.	Wood Product Manufacturing, Distribution, Retailing, Packaging and Secondary manufacture, e.g. joinery and pallet reclamation.	Solid softwood and hardwood. Packaging waste, scrap pallets, packing cases and cable drums. Process off-cuts from the manufacture of virgin/sawn timber and untreated board products.	Nails and metal fixings. Minor amounts of non-hazardous surface coatings, such as water-soluble paint.	This is a waste as defined by the waste regulations. Does not require an IED Chapter IV installation and should not contain any treated or low-grade material.
Grade B Business waste wood = Treated Non-hazardous	This is the preferred feedstock for industrial wood processing operations such as the manufacture of panel board products. Can also be used for IED Chapter IV biomass.	As Grade A, plus construction and demolition operations, skip operators, transfer stations.	May contain Grade A material as above plus building and demolition materials and domestic furniture made from solid wood.	Nails and metal fixings. Some paints, plastics, glass, grit, non-hazardous coatings, binders and glues. Limits on treated or coated materials as defined by end users and IED.	This is mostly solid wood. Some feedstock specifications contain a 5% to 10% limit on former panel products such as chipboard, MDF and plywood. Is a waste for the requirements of Waste Management Regulations. Will require an IED Chapter IV compliant installation for biomass. Any of the items listed in the WRA Waste Wood Assessment Guidance as 'Potentially Hazardous' (*2) must be segregated and tested to prove that they are non-hazardous. Otherwise they must be categorised as Grade D – Hazardous.
Grade C Municipal waste wood = Treated Non-hazardous	For use in the IED Chapter IV biomass installations and for panel board in controlled volumes.	All above plus municipal collections, transfer stations and HWRCs.	All of the above plus flat pack furniture made from board products and DIY materials.	Nails and metal fixings. Paints, coatings and glues, paper, plastics and rubber, glass, grit. Coated and treated timber (non CCA or creosote).	This is mostly board products. Mainly suitable for IED Chapter IV compliant biomass installations, but also suitable for panel board manufacture with correct processing and blending. Is a waste for Waste Management Regulations.
Grade D Hazardous waste wood = Treated hazardous	Requires disposal at facilities licensed to accept hazardous waste.	Waste wood from hydraulic engineering, such as wood from docks. Waste wood from industrial applications such as cooling tower timbers, woodblock flooring or moulds. Waste wood from boats, carriages and trailer beds Waste wood treated with CCA or creosote Any of the items listed in the WRA Waste Wood Assessment Guidance as 'Potentially Hazardous' (*2) must be segregated and tested to prove that they are non-hazardous. Otherwise they must be categorised as Grade D – Hazardous	Agricultural fencing, telegraph poles, railway sleepers. 2 Potentially hazardous waste wood items are: barge boards; external fascias; soffit boards; external joinery (wooden windows and conservatories); external doors; roof timbers; tiling and cladding battens; timber frames and joists from pre-2007 buildings	Copper chrome arsenic (CCA) preservation treatments and creosote.	These materials must be segregated and consigned as hazardous to sites permitted to accept hazardous wood.

Clean/untreated waste wood is suitable for processing into animal bedding, panel board feedstock, landscaping or equestrian surfaces and biomass. Treated, but non-hazardous waste wood is suitable for processing as a feedstock for panel board or energy recovery in a Chapter IV compliant facility. Hazardous waste wood can only be disposed of in a facility licensed for this purpose.

*1 Pre-consumer waste wood is waste wood material created during the manufacturing process of virgin wood, not involving the application of treatments, e.g. offcuts or trimmings from virgin/sawn timber. It is also waste wood material created during the manufacturing process of raw, untreated board products such as panel board, MDF and plywood (for clarity, this waste wood can only be used/burnt at source). Waste from joinery activity using these untreated wood materials is also included in this definition.

Source: The Wood Recyclers' Association September 2023

B Feedstocks Combusted in Each Unit

Key

Virgin biomass
Exempt biomass
Non-exempt biomass

Feedstock	Classification - see below for description from EP application	EWC Code	Feedstock combusted?		
			K7	K8	Chip Drier
Roundwood (logs)	Virgin biomass	n/a	Yes		
Wood chip	Virgin biomass	n/a	Yes		
Recycled timber (RCT)	Exempt biomass, only receive grade A or B of PAS:111 (2012)	03 01 05, 03 03 01, 17 02 01, 19 05 03, 19 12 07, 19 12 12, 20 01 38		Yes	
Fines from grading of RCT	Non-exempt biomass	19 12 07		Yes	
Dusts from dust extraction system	Exempt biomass	03 01 05		Yes	Yes
Off-cuts from Saw Mill	Virgin biomass	03 01 05	Yes	Yes	
Bark from Saw Mill / Chipper	Exempt biomass	03 01 01	Yes	Yes	
Sawdust from Saw Mill	Virgin biomass	03 01 05	Yes	Yes	
Reject material from MDF manufacturing	Exempt biomass	03 01 05		Yes	
Reject material from PB manufacturing (normally sent back to production)	Depends on where in the process collected - exempt or non-exempt biomass. Non-exempt as a worst case	03 01 05		Yes	
Solid residues from skimming of surface water run-off from internal roadways	Depends on where in the process collected - exempt or non-exempt biomass. Non-exempt as a worst case	20 03 03		Yes	

Any other feedstocks?

Feedstock	Classification - see below for description from EP application	EWC Code	K7	K8	Chip Drier
Natural Gas			Yes	Yes	Yes

C BAT Return Spreadsheet

Provided separately as a spreadsheet with submission.

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