



v2

**Explanatory & GUIDANCE
document (E&G-d
on IED-based (draft)
Waste Incineration BREF
and BAT conclusions**

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ANNEX 6.b

**BAT-conclusions checklist for IBA
treatment plants**

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Foreword

This form (Annex 6.b) was written for IBA treatment facilities from municipal and similar waste incinerators, commercial and non-hazardous industrial waste with possibly co-incineration of health care waste and sewage sludge, for which IED applies.

The incineration BREF also defines BAT conclusions for incineration itself. A separate form is for municipal and similar waste incinerators, non-hazardous commercial and industrial waste, clinical waste and sewage sludge (i.e. Annex 6.a). The BAT conclusions (BAT-c)¹ addressing bottom ash in the incineration plant are treated in this form (Annex 6.a). Those on the treatment of bottom ash are in the present form (Annex 6.b). Some BAT conclusions may have to be applied in both the incinerator installation and the IBA treatment facility. They appear in both forms.

This form is intended to be used as a basis for the holder (existing facility) or the applicant (new facility) of the permit to operate of each individual facility in order to establish compliance in respect of the implementation of BAT conclusions of the Incineration BREF (Commission implementing decision n° XXX approved on 12/11/2019 and published in the EU Official Journal on xx/xx/2019)

In the form below, a table summarises the techniques to be implemented for each BAT conclusion of the Incineration BREF applicable to IBA treatment facility. For each of these techniques the user must tick the *Yes* or *No* box. According to these indications, he will indicate at the end of the table (by ticking *Yes* or *No*), whether the installation complies with all the requests of the BAT conclusions (e.g. installation compliant with BAT conclusion 1 (if all answers above are *Yes* or the non applicable for the 3rd point).

Caution: some BATs require that all listed techniques are implemented, other that only one or several of them are implemented.

Some of the techniques may not be applicable in certain circumstances. In this case, this is indicated in red and a check box *not applicable* (at the installation) is available.

Under the summary table of techniques, it is possible **if necessary** to fill in the headings:

- Justification / references
- If the installation does not apply the BAT-c conclusion, planned actions
- Comments

¹ The wording “BAT” is used in the texts with two different meaning, either “BATs”, Best Available Techniques, or “BAT conclusions”, which themselves give a list of Best Available Techniques, often numbered a), b), c) etc., allowing to reach the objective of the BAT conclusions. In order to avoid any ambiguity, in this Guidance document, BAT conclusions are called “BAT conclusion 1” to “BAT conclusion 37”, or abbreviated into “BAT-c 1” to “BAT-c 37”. See Annex 1 to this E&G-d, Section 1.3 and Table 1-1.

IDENTITY SHEET of the INSTALLATION

Name of the installation :

Important city near the installation :

Address :

Phone :

CONTACT

- First Name, Name:
- Phone :
- Mail address :

DESCRIPTION of the INSTALLATION

- Capacity :
- EFW plants from where are the bottom ashes :

<u>EFW plants</u>	<u>t bottom ashes/y treated in the installation</u>
<u>1</u>	
<u>2</u>	
<u>3</u>	
<u>4</u>	
<u>5</u>	
<u>6</u>	
<u>7</u>	

- Type of IBA treatment facility :
 - adjoining the EFW plant **with** load break
 - adjoining the EFW plant **without** load break
 - distant from the EFW plant & IED applies

- Proportion of bottom ash recovered during the last 3 years [aggregates obtained after bottom ash treatment / raw bottom ash received] :

BAT-c 1 (environmental management system) :

	Applied technique	
Product quality management plan (see BAT-c 10)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Diffuse dust emission management plan (see BAT-c 23)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Odour problem not applicable to the installation*.	<input type="checkbox"/>	
Odour management plan if a sensitive receptor has been identified.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Noise problem not applicable to the installation*.	<input type="checkbox"/>	
Noise management plan if a sensitive receptor has been identified (see BAT –c 37)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT –c 1 (if the 4 answers above are Yes or if the 'not applicable' boxes are ticked)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

*Odour and/or noise problem not applicable if one or more of these conditions are found:

- 1) absence of sensitive receptor around the site
- 2) absence of information about historical problems related to odour or noise
- 3) existence of monitoring campaigns showing acceptable levels for noise and/or odour

Justification / references (if necessary):

Techniques 1 to 4 are implemented if, in particular, product quality, dust control, odour control and noise control are included in the Quality Assurance Plan (QAP).

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 3 (key process parameters to monitor) :

	Applied technique	
Waste water, continuous measurement :		
<i>Not applicable because no liquid waste from the bottom ash treatment plant or treatment of liquid waste in a WWTP external to the site</i>	<input type="checkbox"/>	
- Flow	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- pH	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- Conductivity	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 3 (if the answer to the 3 questions above is Yes or if 'not applicable' box is ticked)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

BAT-c 3 not applicable to installation clean waters: for example water from roofs or roads without direct contact with the bottom ash.

Justification / references (if necessary):

If the installation does not comply with the BAT-c planned actions:

Comments (if necessary):

BAT-c 4 (monitoring channelled emissions to air) :

Periodic measurements of channelled emissions:	Applied technique	
Not applicable because no air extraction from a building or blanket dedicated to bottom ash treatment equipment (cf. BAT n° 26)	<input type="checkbox"/>	
Dust once a year (and in accordance with EN 13284-1)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 4 (if the answer above is Yes or if 'not applicable' box is ticked)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary):

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 6 (monitoring emissions to water from bottom ash treatment) :

	Applied technique	
Not applicable because no wastewater from IBA treatment	<input type="checkbox"/>	
- TOC (EN 1484) *	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- Total suspended solids (TSS) (EN 872)*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- Pb (EN standard) *	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- PCDD/F (dioxins & furans) : measurement each 6 months	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- NH ₄ -N (EN standard)*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- Cl- (EN standard)*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
- SO ₄ ²⁻ (EN ISO 10304-1)*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 6 (if all the above answers are Yes or if 'not applicable' box is ticked)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

* monthly measurements or every 6 months if emissions are stable enough.

Sampling and analysis:

- In case of continuous discharges, analyses are performed on a 24-hour flow-proportional composite sample.

- In the case of batch discharges, analyses are carried out on a composite sample (flow-proportional sampling) during the duration of the discharge or on a spot sample taken before discharge if the effluent is sufficiently mixed and homogeneous.

Compliance with the BATAELs is assessed on the effluent exiting the bottom ash treatment plant.

BAT-c 6 is not applicable to the installation clean waters: for example water from roofs or roads without direct contact with the bottom ash.

Justification / references (if necessary):

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 10 (output quality management system for bottom ash treatment) :

	Applied technique	
Implementation of a product quality management plan for the bottom ash treatment plant	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT c 10 (if the above answer is Yes)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary):

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 12 (handling and storage of waste) :

	Applied technique	
a) Waterproofing of surfaces and implementation of a drainage system.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
b) Adequate storage capacity: definition of the maximum storage capacity on the basis of the processing capacity and the quality of the waste; regular monitoring of the quantities in stock with respect to the maximum capacity; definition of a maximum residence time for unmixed waste during storage.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 12 (if the answers above are Yes)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary):

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 23 (reduction of diffuse dust emissions to air) :

	Applied technique	
Identification of major sources of diffuse emissions (e.g. using EN 15445)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Definition and implementation of appropriate actions to prevent or reduce diffuse emissions over a given time frame*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 23 (if all the above answers are Yes)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

* Actions to prevent and reduce diffuse dust emissions can be one-off, targeting one or more temporary sources of dust emissions: for example, loading and unloading of bottom ash, falling in very dry periods (bottom ash too dry or unfavourable weather conditions), punctual operations of grinding or screening (for example for the reprocessing of coarse fractions of bottom ash).

Justification / references (if necessary) :

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 24 (reduction of diffuse dust emissions to air) :

To prevent or reduce diffuse dust emissions the bottom ash treatment plant is compliant if it uses a relevant combination of the techniques below:	Applied technique	
a) Coverage of potential dust source equipment, such as grinders, sieves, conveyor belts and elevators Or installation of all equipment in closed building.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
b) Limitation of the height of the falls. Adaptation of the unloading height to the pile height, if possible automatically (e.g. adjustable height of the conveyor outlet).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
c) Stockpiles protection from prevailing winds by screens or walls and orientation of stockpiles taking prevailing winds into account.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
d) Implementation of a water spray system at the main sources of diffuse dust emission. Humidification of dust particles promotes	Yes <input type="checkbox"/>	No <input type="checkbox"/>

agglomeration and sedimentation of particles. Emissions of diffuse dust on the stockpiles are reduced by providing proper humidification at the loading and unloading points, on the falls and on the stockpiles themselves.		
e) Optimising the moisture content of bottom ash at a level that allows efficient extraction of metals by minimizing dust emission.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
f) If dry bottom ash extraction or if the bottom ash has a low moisture content, maintain the enclosure or closed building under sub-atmospheric pressure by extraction and air treatment (techniques defined by BAT-c 26).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 24 (if the appropriate measures are taken: one or more of the above responses are Yes)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary):

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 26 (Emissions of air extracted from dusty areas of slag treatment ; in case of application of technique (f) of BAT-c 24) :

	Applied technique	
Technique (f) of BAT-c 24 not applicable	<input type="checkbox"/>	
Extracted air treatment with a bag filter.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT 26 (if the answer above is Yes + emissions shown in the table below within the BATAEL range or if the technique is not applicable)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary) :

Table 5.2 :

Measurements made over the last 3 years measured in chimney. For installations in operation for less than 3 years, indicate the available data. For new or newly equipped installations, indicate the expected values:

	Year n-2	Year n-1	Year n	BATAEL range
Dust	mg/Nm ³	mg/Nm ³	mg/Nm ³	2 – 5 mg/Nm ³

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 32 (waste water streams management) :

	Applied technique	
Clean runoff and waste water in direct contact with bottom ash are separated and treated separately according to their characteristics and applicable treatment technologies. Clean water that does not require treatment is managed separately. *	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 32 (if the answer above is Yes)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

* For existing installations, BAT-c 32 is applicable within the constraints of configuration of the water collection network in place.

Justification / references (if necessary) :

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 34 (reduce emissions to water) :

	Applied technique	
<i>Not applicable (no liquid discharge)</i>	<input type="checkbox"/>	
b) Equalisation of effluents	Yes <input type="checkbox"/>	No <input type="checkbox"/>
c) Neutralisation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
d) Physical separation, e.g. screens, sieves, grit separators, primary settlement tanks	Yes <input type="checkbox"/>	No <input type="checkbox"/>
e) Adsorption on activated carbon (or similar)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
f) Precipitation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
g) Oxidation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
h) Ion exchange	Yes <input type="checkbox"/>	No <input type="checkbox"/>
i) Stripping	Yes <input type="checkbox"/>	No <input type="checkbox"/>
j) Reverse osmosis	Yes <input type="checkbox"/>	No <input type="checkbox"/>
k) Coagulation and flocculation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
l) Sedimentation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
m) Filtration	Yes <input type="checkbox"/>	No <input type="checkbox"/>
n) Flotation	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 34 (if not applicable is ticked or if the above answers indicate a combination of techniques appropriate to the reduction of pollutant emissions in liquid effluents + the emissions shown in the table below (Max	Yes <input type="checkbox"/>	No <input type="checkbox"/>

(excluding the highest value of each year)) **within BATAELs ranges**

BAT 34 not applicable to the clean water of the installation: for example water from roofs or roads which do not come into direct contact with the bottom ash.

Sampling and analysis:

- In case of continuous discharges, analyses are performed on a 24-hour flow-proportional composite sample.
- In the case of batch discharges, analyses are carried out on a composite sample (flow-proportional sampling) during the duration of the discharge or on a spot sample taken before discharge if the effluent is sufficiently mixed and homogeneous.

Compliance with the BATAELs is applied to the effluent output the bottom ash treatment plant.

Tables 5.7 & 5.8

	min	max	average	Max (excluding the highest value of each year)	BATAELs ranges
Total suspended solids (TSS) Not taken into account if releases in an external WWTP	mg/l	mg/l	mg/l	mg/l	10 -30 mg/l
TOC Not taken into account if releases in an external WWTP	mg/l	mg/l	mg/l	mg/l	15 - 40 mg/l
Pb	mg/l	mg/l	mg/l	mg/l	0,02 – 0,06 mg/l
NH ₄ -N Not taken into account if releases in an external WWTP	mg/l	mg/l	mg/l	mg/l	10-30 mg/l
SO ₄ ²⁻ Not taken into account if releases in an external WWTP	mg/l	mg/l	mg/l	mg/l	400-1000 mg/l

These BATAELs may not apply to indirect emissions (external WWTP releases) if the wastewater treatment plant downstream of the site is designed and equipped to reduce these pollutants, provided that this does not result in higher level of pollution in the environment.

Justification / references (if necessary) :

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 36 (increase resource efficiency for the treatment of slags and bottom ashes) :

To increase the recovery of resources in the treatment of bottom ash, BAT-c 36 is the implementation of an appropriate combination of the following techniques (based on a risk analysis and depending on the hazard properties of bottom ash):

	Applied technique	
a) Screening and sieving	Yes <input type="checkbox"/>	No <input type="checkbox"/>
b) Crushing	Yes <input type="checkbox"/>	No <input type="checkbox"/>
c) Aeraulic separation (light fractions)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
d) Recovery of ferrous and non-ferrous metals	Yes <input type="checkbox"/>	No <input type="checkbox"/>
e) Ageing	Yes <input type="checkbox"/>	No <input type="checkbox"/>
f) Washing	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Installation compliant with BAT-c 36 (if the above answers indicate an appropriate combination of techniques)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Justification / references (if necessary) :

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

BAT-c 37 (prevent or, where that is not practicable, reduce noise emissions) :

To prevent or reduce noise, BAT-c 37 is the implementation of one or a combination of the following techniques.

	Applied technique	
a) Appropriate location of equipment and buildings: increase in distance between transmission and receiver, use of buildings as a noise barrier.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
b) Operational measures: maintenance of equipment, closing of doors and windows requiring it (vis-à-vis noise), operation by experienced staff, avoidance of noisy activities at night, control of noise emitted during maintenance operations, etc.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
c) Installation of low-noise equipment (especially when replacing or adding equipment): compressors, pumps, fans, etc.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
d) Noise mitigation measures: installation of screens, ...	Yes <input type="checkbox"/>	No <input type="checkbox"/>
e) Control of noise emitted by equipment: noise reducers, noisy equipment enclosed in rooms or in acoustic enclosures, acoustic treatment of rooms with noisy equipment ...	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Installation compliant with BAT-c 37 (if the above answers indicate a combination of techniques appropriate to reduce or attenuate noise)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
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Justification / references (if necessary) :

If the installation does not comply with the BAT-c, planned actions:

Comments (if necessary):

ALL applicable BAT-c are applied ?

YES

NO

NUMBERS OF NOT APPLIED BAT-c : XX

Comments (if necessary):

Made on (date) .../.../.....

at XX

By :