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DRAWING UP OF THE BAT REFERENCE DOCUMENT FOR COMMON WASTE GAS MANAGEMENT AND TREATMENT SYSTEMS IN THE CHEMICAL SECTOR (WGC BREF)

Final assessment of split views

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1 INTRODUCTION

1.1 General aspects

According to Commission Implementing Decision 2012/119/EU (Section 4.6.2.3, page 27), the following provisions apply to dissenting views expressed at Final TWG Meetings:

> 4.6.2.3 Final TWG meeting
>
> 4.6.2.3.1 General
>
> The final TWG meeting aims at resolving outstanding issues with a view to conclude the technical discussions within the TWG.
>
> […]
>
> In the final TWG meeting, the objective is to reach conclusions by consensus of the TWG members present. When there are well-founded dissenting views, these will be recorded as indicated in Section 4.6.2.3.2 below.
>
> 4.6.2.3.2 Split views
>
> BAT as well as environmental performance levels (see Section 3.3) associated with BAT will be drafted by the EIPPCB on the basis of information available at the time of distributing the draft to the TWG for its final meeting (see Section 4.6.2.3). Such information may include any specific proposals for BAT or associated environmental performance levels received from the TWG.
>
> TWG members are expected to provide sound technical, cross-media and economic arguments as relevant to their case when they do not agree with the draft BAT conclusions. Such arguments should be submitted initially as comments to the formal draft BREF within the consultation period set (see Section 1.2.4).
>
> If the TWG in the end reaches no consensus on an issue, the dissenting views and their rationale will be reported in the "Concluding remarks and recommendations for future work" section of the BREF only if both the following conditions are fulfilled:
>
> 1. the dissenting view is based on information already made available to the EIPPCB at the time of drafting the conclusions on BAT for the BREF or has been provided within the commenting period corresponding to such a draft;
> 2. a valid rationale supporting the split view is provided by the TWG member(s) concerned. The EIPPCB will consider a rationale to be valid if it is supported by appropriate technical, cross-media or economic data or information relevant to the definition of BAT.
>
> The Member States, environmental NGOs or industry associations that bring or support the split view will be explicitly named in the document (see Section 2.3.10).

This document lists the split views submitted in the context of the Final TWG Meeting for the drawing up of the WGC BREF (which was held between 15 June and 2 July 2021 via a series of 7 web-based meetings), and assesses for each split view whether both of the conditions 1 and 2 listed above are met. The chapter on "Concluding remarks and recommendations for future work" of the WGC BREF shall reflect the dissenting views for which the present assessment shows that such conditions are met.

However, a positive assessment of those conditions and the reporting of a split view in the BREF are not to be interpreted as an agreement of the EIPPCB with the arguments supporting that split view, or as an indication that the related BAT conclusion as agreed at the Final TWG Meeting may be subject to changes.

For the purposes of this document, the following acronyms are used.

Acronym	Definition
AT	Austria
BAT	Best Available Techniques (as defined in Article 3(10) of the IED)
BAT-AEL	Emission level associated with the BAT (as defined in Article 3(13) of the IED)
BATC	BAT Conclusions
BATIS	BAT Information System
BE	Belgium
BREF	BAT reference document (as defined in Article 3(11) of the IED)
CBI	Confidential business information
CEFIC	European Chemical Industry Council
CEN	European Committee for Standardization
CICP	Complex Inorganic Colour Pigments
CMR	Carcinogenic, mutagenic or toxic for reproduction
CMR 1A	CMR substance of category 1A as defined in Regulation (EC) No 1272/2008 as amended, i.e. carrying the hazard statements H340, H350, H360.
CMR 1B	CMR substance of category 1B as defined in Regulation (EC) No 1272/2008 as amended, i.e. carrying the hazard statements H340, H350, H360.
CMR 2	CMR substance of category 2 as defined in Regulation (EC) No 1272/2008 as amended, i.e. carrying the hazard statements H341, H351, H361.
CMS	Chemicals Management System
CO_2	Carbon dioxide
CZ	Czech Republic
DE	Germany
D1	First draft of the WGC BREF (November 2019)
DIAL	Differential absorption LIDAR
DK	Denmark
ECHA	European Chemicals Agency
EEB	European Environmental Bureau
EIPPCB	European IPPC Bureau
EMS	Environmental Management System
EP(s)	Emission point(s)
E-PVC	PVC produced by emulsion polymerisation
ES	Spain
FI	Finland
FMP	Ferrous Metal Processing
HF	Hydrogen fluoride
IED	Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control)
IT	Italy
LCA	Life cycle assessment
LCP BREF	BAT Reference Document for Large Combustion Plants
LDPE	Low-density polyethylene
LVOC BREF	BAT Reference Document for the Production of Large Volume Organic Chemicals
MCPD	Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants
LLDPE	Linear low-density polyethylene
NGOs	Non-governmental organisations
NL	Netherlands
NO_x	The sum of nitrogen monoxide (NO) and nitrogen dioxide (NO_2), expressed as NO_2
ORGALIME	Europe's Technology Industries
PT	Portugal
PVC	Polyvinyl chloride
REACH	Regulation EC/1907/2006 on the Registration, Evaluation and Authorisation of Chemicals
ROM REF	JRC Reference Report on Monitoring of Emissions to Air and Water from IED Installations
SE	Sweden

SOF	Solar occultation flux
STS BREF	BAT Reference Document on Surface Treatment Using Organic Solvents
TVOC	Total volatile organic carbon, expressed as C
TWG	Technical Working Group
TXT	Textile industry
VCM	Vinyl chloride monomer
VOC	Volatile organic compound (as defined in Article 3(45) of the IED)
WGC BREF	BAT Reference Document for Common Waste Gas Management and Treatment Systems in the Chemical Sector
WWTP	Waste water treatment plant

1.2 Overview of split views expressed at the Final TWG Meeting for the drawing up of the WGC BREF and confirmed afterwards

During the Final TWG Meeting for the drawing up of the WGC BREF, a high degree of consensus was achieved within the TWG. Nevertheless, 39 dissenting views were recorded at the meeting and confirmed afterwards. These are listed in Table 1.2.1 and Table 1.2.2 below.

Table 1.2.1 Split views related to single items (e.g. Definition, BAT and/or Table)

Split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it	Section number in this document
1	23	Definition of process furnace/heater	-	DE	2.1.1
2	37	Methodology for calculating the mass flow in the 'General considerations'	-	DE, EEB	3.1.1
3	34, 35	O_2 correction in the case of process furnace(s)/heater(s) using indirect heating	-	CEFIC, supported by CZ	3.1.2
4	48	Chemical management system as a feature of the EMS	BAT 1	CEFIC, ORGALIME, supported by CZ	4.1.1
5	62, 63	Description of BAT 5	BAT 5	CEFIC, supported by CZ	4.2.1.1
6	71	Minimum monitoring frequency for CMR substances, including chloromethane	BAT 8	CEFIC, ORGALIME, supported by CZ	4.2.2.1
7	67 to 81	Minimum monitoring (and reporting) frequency for the mass flow	BAT 8	EEB	4.2.2.2
8	89, 90	Applicability of some techniques	BAT 11	IT	4.2.3.1
9	96, 97	Mass flow value in footnote ([4bis]) and footnote ([8])	BAT 11/Table 4.1	CEFIC, ORGALIME, supported by CZ and IT	4.2.3.2
	193	Mass flow value in footnote ([1])	BAT 29/Table 4.10		
10	95	Mass flow value in footnote ([3])	BAT 11/Table 4.1	EEB	4.2.3.3
11	92 to 94	'Sum of VOCs classified as CMR 1A o 1B (or CMR 2)'	BAT 11/Table 4.1	DE, AT	4.2.3.4

[1] *WGC Final Meeting_Conclusion Slides.pdf* available in: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>07 Conclusions

Split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it	Section number in this document
12	96, 97	Addition of footnote ([4bis]), footnote ([5bis]) and keeping footnote ([8])	BAT 11/Table 4.1	EEB	4.2.3.5
	110	Addition of footnote ([yy]) and keeping of footnote ([7])	BAT 14/Table 4.3		
13	92 to 97	Subtraction of methane emissions from the result of TVOC monitoring	BAT 11/Table 4.1	CEFIC, supported by CZ	4.2.3.6
14	109	Mass flow value in footnote ([2])	BAT 14/Table 4.3	EEB	4.2.5.1
15	119	Deletion of footnote ([3])	BAT 16/Table 4.4	IT	4.2.4.1
16	119	Adjustment of footnote ([4])	BAT 16/Table 4.4	IT	4.2.4.2
17	118	Upper end of the BAT-AEL range for NO_X from thermal oxidation	BAT 16/Table 4.4	CEFIC, supported by CZ	4.2.4.3
18	128 to 131	BAT-AEL for channelled emissions to air of gaseous fluorides, expressed as HF	BAT 18/Table 4.6	ES, CEFIC	4.2.4.4
19	136	Distinction between CMR 2 substances and other non-CMR substances	BAT 19	EEB	4.3.1.1
20	136	Wording 'targeting 100 ppmv'	BAT 19	CEFIC, supported by CZ and IT	4.3.2
21	158	Monitoring frequency in footnote ([4])	BAT 22	SE	4.3.3.1
22	159	Not to refer to SOF and DIAL as BAT	BAT 22	BE, SE and EEB	4.3.3.2
23	164	Use of high-integrity equipment as main technique	BAT 23	DE, supported by EEB	4.3.4.1
24	164	Applicability restrictions to the use of high-integrity equipment for existing plants, other than operational constraints	BAT 23	IT	4.3.4.2
25	171	BAT-AEL for diffuse VOC emissions to air from the use of solvents or the reuse of recovered solvents	Table 4.7	EEB	4.3.5.1
26	181	Upper end of the BAT-AEL range for LLDPE	BAT 25/Table 4.8	AT	5.1

Split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it	Section number in this document
27	181	Upper end of the BAT-AEL range for LDPE in footnote (2^{bis})	BAT 25/Table 4.8	AT, SE	5.2
28	188	Minimum monitoring frequency for the vinyl chloride monomer concentration in PVC products	BAT 27	DE, SE	5.3
29	193	Deletion of footnote (^{1}) and footnote (^{2})	BAT 29/Table 4.10	EEB	5.4
30	193	Upper end of the BAT-AEL range in footnote (^{2})	BAT 29/Table 4.10	CEFIC	5.5
31	193	BAT-AEL range in BAT 29/Table 4.10	BAT 29/Table 4.10	PT	5.6
32	200	Upper end of the BAT-AEL ranges for the VCM concentration in the PVC	BAT 30/Table 4.12	EEB	5.7
33	200	Upper end of the BAT-AEL range for E-PVC	BAT 30/Table 4.12	CEFIC	5.8
34	181 198, 200 205	Deletion of Table 4.8, Table 4.11, Table 4.12 and Table 4.13	BAT 25/Table 4.8 BAT 30/Tables 4.11,4.12 BAT 32/Table 4.13	DE	5.9
35	223, 224	Deletion of footnote (^{3})	BAT 36/Table 4.17	AT, BE, DE, SE, EEB	6.1
36	223, 224	Deletion of footnote (^{xx})	BAT 36/Table 4.17	AT, DE	6.2

Table 1.2.2 Split views related to several items

Split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it	Section number in this document
37	-	Dedicated provisions for batch processes	-	CEFIC supported by CZ	7.1
38	85 89, 90 104 113 126	Meaning of 'excessive energy demand' and 'low concentration' in the applicability	BAT 9, BAT 11 BAT 13, BAT 15 BAT 18	EEB	7.2

Split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it	Section number in this document
39	92 to 97, 108 to 110, 128 to 131, 193 223 to 224	Deletion of 'e.g.' before the values of the mass flows in footnotes	BAT 11/Table 4.1, BAT 14/Table 4.3, BAT 18/Table 4.6, BAT 29/Table 4.10 BAT 36/Table 4.17	DE, DK, SE, EEB	7.3

[1] *WGC Final Meeting_Conclusion Slides.pdf* available in: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>07 Conclusions

For each split view[2] listed in the tables above, the detailed rationales provided after the meeting by the TWG member(s) concerned are summarised in the following pages together with the EIPPCB's assessment and an indication of whether/how the split views could be reported in the BREF. The content of individual split views on the same topic may differ from one to another. In this document, some split views have been grouped together when the proposals and the rationales are similar.

[2] Full versions of all split views provided are available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views;

1.3 Split views expressed during the Final TWG Meeting for the drawing up of the WGC BREF but not confirmed after the meeting

The following dissenting views were expressed during the Final TWG Meeting but not confirmed by sending documentation to the EIPPCB after the meeting. These split views are considered as not having been submitted and are not presented or assessed in this document.

Unconfirmed split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it
1	96, 97	Addition of footnote ([4bis]) and footnote ([5bis])	BAT 11/Table 4.1	DE
2	160	Thresholds in the applicability of BAT 22	BAT 22	CEFIC
3	218	BAT-AEL range from the production of staple fibres	BAT 35/Table 4.16	CEFIC

1.4 Split views expressed during the Final TWG Meeting for the drawing up of the WGC BREF but not provided according to the required template

The following dissenting view was expressed during the Final TWG Meeting but not provided with the required template[3].
However, the related document (posted on BATIS in a different folder to the one holding all the split view files) does not contain appropriate technical, cross-media or economic information to be considered in an EIPPCB assessment. Therefore, the dissenting view is not presented in this document.

Unconfirmed split view number	Consolidated WGC Final Meeting conclusions' slide number(s)[1]	Topic	BAT conclusion/ Table number	TWG member(s) raising the split view(s) and those supporting it
1	60	Reference to factors such as greenhouse gas emissions	BAT 4	NL

[1] *WGC Final Meeting_Conclusion Slides.pdf* available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>07 Conclusions
[3] The document available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>03 TWG feedback on BP and revised draft BATC

1.5 Colour code used

For ease of reference, this document contains some selected parts of the revised draft of the 'WGC BAT conclusions' (version of July 2021), i.e. comprising all the decisions taken during the Final TWG Meeting.

The colour code used is the following:

Black:	Text from Draft 1 (D1).
Blue:	New text in the revised draft BAT conclusions (version of 30 April 2021, for the Final TWG Meeting) taking into account the comments received on D1.
~~Orange:~~	Text deleted in the revised draft BAT conclusions (version of 30 April 2021, for the Final TWG Meeting) taking into account the comments received on D1.
Red:	New text based on the Final Meeting discussions.
~~Purple:~~	Text deleted based on the Final Meeting discussions.

Where relevant, the document also provides the reference to the slide number(s) of the consolidated 'WGC Final Meeting conclusions'[1].

Please note that, compared to the consolidated conclusion slides[1], the selected parts of the revised draft of the 'WGC BAT conclusions' reported here may have undergone minor language and/or formatting corrections to ensure consistency.

1.6 Common references

For consistency purposes, direct references to similar sources of information were harmonised throughout the document (e.g. using, whenever possible, the same name/title resulting in BATIS). In addition, for the sake of brevity, the following common references apply:

- 'Comment(s) provided on D1' refers to comments provided on the first draft of the WGC BREF (version of November 2019);
  [available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>11 Draft 1>Submitted comments]

- 'Comment(s) provided on the revised draft BATC' refers to comments provided on the revised draft of the BAT conclusions of the WGC BREF (version of 30 April 2021);
  [available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting> 03 TWG feedback on BP and revised draft BATC]

[1] *WGC Final Meeting_Conclusion Slides.pdf* available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>07 Conclusions

2 DEFINITIONS

2.1 Definition of process furnace/heater

Conclusion of the Final TWG Meeting

[…]

Process furnace/heater	Process furnaces or heaters are: • combustion units used for the treatment of objects or feed material through direct contact, e.g. in drying processes or chemical reactors; or • combustion units whose radiant and/or conductive heat is transferred to objects or feed material through a solid wall without using an intermediary heat transfer fluid, e.g. furnaces or reactors heating a process stream used in the (petro-)chemical industry ~~such as steam cracker furnaces~~. As a consequence of the application of good energy recovery practices, some of the process furnaces/heaters may have an associated steam/electricity generation system. This is an integral design feature of the process furnace/heater that cannot be considered in isolation.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 23

2.1.1 Definition of process furnace/heater [DE]

Split view n. 1 - Summary of the split view[4]

DE proposes to change the wording of the second bullet point in the definition of 'process furnace/heater', in order to include combustion units using an intermediary heat transfer fluid as follows:

- "combustion units whose radiant and/or conductive heat is transferred to objects or feed material through a solid wall, e.g. furnaces or reactors heating a process stream used in the (petro-) chemical industry".

Summary of the rationale accompanying the split view

- The MCPD excludes in Article 2 (3) k) "reactors used in the chemical industry".
- The IED excludes in Article 28 e) "reactors used in the chemical industry" as combustion plants covered by Chapter III of the IED.
- As there is no definition of "reactors" and "reactors used in the chemical industry" in the MCPD or IED, combustion units which are part of the activity specified in Annex I to the IED: 4. Chemical industry, and thus in the scope of the WGC BREF, may be generally considered as reactors, either incinerating regular fuels or waste gases from chemical processes. If thermal oil systems with a firing rate of less than 50 MW_{th} are used in plants in the scope of the WGC BREF and are considered as reactors, they would not fall under any regulation as they are excluded by the LCP BREF/BATC, the MCPD and the WGC BREF/BATC (according to the definition of process furnaces/heaters therein provided).

[4] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *DE-Split view on definition of process furnaces heater.docx.*

Information on which the split view is based

- DE comment expressed at the Final TWG Meeting, highlighting a potential regulatory gap on thermal oil heaters used in WGC plants.

EIPPCB assessment

The information on which the split view is based was available on time.

Validity of supporting rationale:

- The supporting rationale seems aimed at addressing potential regulatory inconsistencies between a certain set of legislative acts in force, which goes beyond the remit of the process of drawing up the WGC BREF and the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU.
- Combustion plants such as process furnaces/heaters, considered an integral part of reactors used in the chemical industry, are excluded from the scope of the MCPD and the LCP BREF.
- The definition of process furnaces/heaters agreed in the consolidated revised draft WGC BATC results from the definition provided in the questionnaire used for the data collection exercise. Such a definition was introduced to create consistency between the WGC BREF and the definitions adopted by the LCP and LVOC BREFs. Indeed, both the LCP and LVOC BREFs were used to determine which types of processes are included in/excluded from the scope of the WGC BREF.
- The data collected via the questionnaires refer to chemical plants using process furnaces/heaters as defined in the revised draft WGC BATC.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of DE does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

3 GENERAL CONSIDERATIONS

3.1 Emission levels associated with the Best Available Techniques (BAT-AELs) and indicative emission levels for channelled emissions to air

Conclusion of the Final TWG Meeting

[…]

For the purpose of calculating the mass flows in relation to ~~BAT 8~~, BAT 11 (Table 4.1), BAT 14 (Table 4.2), BAT 18 (Table 4.6), BAT 29 (Table 4.9) and BAT 36 (Table 4.15), where waste gases ~~from one type of source (e.g. process furnaces/heaters)~~ with similar characteristics, e.g. containing the same (type of) substances/parameters, and discharged through two or more separate stacks could, in the judgement of the competent authority, ~~taking technical and economic factors into account~~, be discharged through a common stack, these stacks shall be considered as a single stack.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 37

3.1.1 Methodology for calculating the mass flow in the 'General considerations' [DE, EEB]

Split view n. 2 - Summary of DE split view[5]

DE proposes to:

- define a method for calculating the mass flow for a 'WGC plant', in relation to mass flow indications provided in BAT 11 (Table 4.1), BAT 14 (Table 4.3), BAT 18 (Table 4.6), BAT 29 (Table 4.10) and BAT 36 (Table 4.17); and
- modify the wording of the paragraph as follows: "For the purpose of calculating the mass flows in relation to BAT 11, BAT […] and BAT 29, where waste gases containing the same pollutants are discharged through two or more stacks, these stacks must be considered as a single stack."

Split view n. 2 - Summary of EEB split view[5]

EEB proposes to complement the wording of the paragraph as follows:

[…]

The competent authority shall especially consider the following aspects:
- plant safety, e.g. avoiding concentrations close to the lower explosive limit;
- environmental factors, e.g. maximising recovery of materials or pollutant abatement;
- technical factors, e.g. compatibility of the individual waste gas streams.

Each constituent waste gas flow (if more than one), that is either directly or indirectly associated with the **WGC production line***, shall be added, and aggregated pursuant to BAT 5.

[5] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *DE-Split view on General considerations - mass flow calculation.docx; EEB Split view on General considerations_mass flow calculation.docx.*

Where waste gases are discharged through a common stack, the request for splitting the waste gas stream into two or more separate stacks, following the publication of these BAT conclusions, shall not be permitted.

The measurement shall be conducted in the raw gas (before abatement).

The mass flow, to be compared against the given mass flow thresholds, shall correspond to the averaging period of the type of measurement, i.e., daily average for continuous measurement and 'average over the sampling period' for periodic measurement.

***'WGC production line'** (to be added to the 'definitions' section):
'a production line includes any stationary technical units and any other directly associated activities which have a technical connection with the activities carried out on that production line and which could have an effect on emissions and pollution. Directly associated activities include storage, handling and process steps relating to inputs (raw materials, incl. chemicals) and outputs (product, waste) relevant production steps'.

Summary of rationale accompanying the DE split view

- The IED stresses in recital no. 2 that "it is necessary to establish a general framework for the control of the main industrial activities".
- The IED aims in recital no. 3 at "a level playing field in the Union by aligning environmental performance requirements for industrial installations".
- The wording "[...] could, in the judgement of the competent authority, [...]" contradicts a harmonised implementation for defining an aggregation of mass flows to compare with mass flow thresholds. In addition, it is not specified how the mass flow shall be determined (e.g. based on maximum or average pollutant concentrations and waste gas flows) and there is no description of how or how often the waste gas flow shall be monitored. The proposed wording should be combined with a mass flow threshold monitoring, based on the measurements of the waste gas concentration, in line with averaging periods defined in BAT 8.

Summary of rationale accompanying the EEB split view

- Same rationale indicated in the first two bullet points in the *Summary of rationale accompanying the DE split view* (above).
- The current wording contradicts a harmonised implementation for defining an aggregation of mass flows to compare with mass flow thresholds. Therefore, it was proposed to add further text as explained below:
    - The sentence: 'The competent authority shall (...) individual waste gas streams' is added to clarify the factors that the competent authority shall take into consideration.
    - The term 'WGC production line' is introduced to ensure that all relevant waste gas flows will be accounted for when calculating the mass flow.
    - The sentence: 'Where waste gases (...) permitted' is to ensure the absence of 'splitting' of emission points with the purpose of evading the pollution abatement requirements. If such actions are needed, e.g. in the context of a major plant upgrade, this can be dealt with by IED Article 15(4).
    - The measurement shall be conducted in the raw gas (before abatement), so that the comparison of the mass flow against the mass flow threshold can inform the decision on the abatement effort needed.
    - The averaging period of the (pollutant) mass flow, to be compared against the given mass flow thresholds, shall be determined to ensure a harmonised approach during the implementation phase. It makes sense to use the same averaging periods as for the BAT-AELs.

Information supporting the DE split view

- Comments provided on D1 (DE-A37, DE-A119, DE-A124, DE-A127).
- DE presentation "Mass Flow (MF) Thresholds Considerations from DE point of view" for the 2nd Data Assessment Workshop (1-2 December 2020).
- Common proposal (3 May 2021) on Mass Flow Thresholds (submitted by: AT, BE, DE, DK, FI, SE) after the 2nd Data Assessment Workshop (1-2 December 2020).
- Comments provided on the revised draft BATC (DE-5, DE-18).

Information supporting the EEB split view

- Comments provided on the revised draft BATC (EEB-1, EEB-3).
- 'EEB position paper on mass flow thresholds' (uploaded in BATIS on 24/03/2021).

EIPPCB assessment of DE and EEB split views

The documents and information on which the split views are based were available on time.

Validity of supporting rationale:

- The rationales submitted do not include additional technical, cross-media or economic data or information, but rather refer to legal provisions and implementation issues.
- The diversity and the complexity of chemical plants and the potential interface between chemical plants covered by the WGC BATC and plants which might be outside the scope of the WGC BATC (e.g. LVOC plants or the production of specific inorganic chemicals) need to be taken into account when calculating the mass flow for the purpose of implementation of the WGC BATC. Indeed, no definition for 'WGC plant' or 'WGC production unit or line' was concluded on in the Final TWG Meeting and no split views were raised on this issue.
  Moreover, the purpose of the paragraph is to provide indications on which type of waste gas streams should be taken into account for the calculation of the mass flows in relation to BAT 11 (Table 4.1), BAT 14 (Table 4.3), BAT 18 (Table 4.6), BAT 29 (Table 4.10) and BAT 36 (Table 4.17). These BATs include indicative mass flow values identified as 'minor emissions' rather than mass flow thresholds.
  The calculation also includes the possibility to combine waste gas streams with similar characteristics, thus minimising the splitting of EPs (as specified in BAT 5). However, different approaches on the calculation of the mass flow have been adopted by Member States.
- Concerning measurements to be conducted in the raw waste gas, the monitoring of the concentration level in the waste gas streams before the waste gas treatment was not agreed on in the Final TWG Meeting (see BAT 8).

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split views representing the opinion of DE and EEB partially fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. These split views will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
-	*To delete in the section 'General considerations' the expression 'in the judgement of the competent authorities'.*	*DE, EEB*	*NA*

3.1.2 O_2 correction in the case of process furnace(s)/heater(s) using indirect heating [CEFIC, supported by CZ]

Conclusion of the Final TWG Meeting

[…]

The reference oxygen levels used to express BAT-AELs and indicative emission levels in these BAT conclusions are shown in the table below.

Source of emissions	Reference oxygen level (O_R)
Process furnace/heater using indirect heating	3 dry vol-%
All other sources	No correction for the oxygen level

For the cases where a reference oxygen level is given, the equation for calculating the emission concentration at the reference oxygen level is:

$$E_R = \frac{21 - O_R}{21 - O_M} \times E_M$$

where:
E_R: emission concentration at the reference oxygen level O_R;
O_R: reference oxygen level in vol-%;
E_M: measured emission concentration;
O_M: measured oxygen level in vol-%.

The equation above does not apply if the process furnace(s)/heater(s) use oxygen-enriched air or pure oxygen or when additional air intake for safety reasons brings the oxygen level in the waste gas very close to 21 vol-%. In this case, the emission concentration at the reference oxygen level of 3 dry vol-% is calculated differently.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 34, 35

Split view n. 3 - Split view summary[6]

CEFIC, supported by CZ, proposes to delete the reference oxygen correction introduced for process furnaces/heaters using indirect heating and introduce a regulation to support the IED requirement of a level playing field for permits of industrial plants in Europe.

Summary of the rationale accompanying the split view

- The inclusion of the reference oxygen for process furnaces/heaters using indirect heating was agreed on during the Final TWG Meeting although not proposed in the revised draft BATC (*references to pages 19, 80, 164 from the Background Paper for the Final TWG Meeting, 30 April 2021)***.**
- According to the ROM, the reference oxygen levels differ from one process to another and from one sector to another. This situation is reflected in the data collection of WGC BREF as has been mentioned by the EIPPCB.

[6] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *Cefic SV_Oxygen Correction Final.pdf.*

- A detailed process analysis has not been carried out prior to the definition of the reference oxygen and associated BAT-AEL values during the Final TWG Meeting. This point is relevant for the derivation of BAT-AELs for all kinds of pollutants *(reference to data on oxygen content distribution in process furnaces and heaters, extracted from the WGC QLIK Sense application).*
- Information provided on the calculations to convert emission concentrations at the reference oxygen level is incomplete:
    - The correction factor to be used for "the oxygen level in the waste gas very close to 21 vol-% is not defined. In this case, the emission concentration at the reference oxygen level of 3 dry vol-% is calculated differently."
    - The meaning of "very close to 21 vol-%" is not defined. Neither permitting authorities nor plant operators can apply a legally compliant definition.
    - It is proposed to include in the 'Concluding remarks and recommendations for future work' to collect information on the reasons other than safety when additional air intake brings the oxygen level in the waste gas very close to 21 vol-%.
      There are technical reasons that clearly justify levels of oxygen close to 21 vol-% that have not been considered in the 'General considerations' due to a lack of information because it was not detected along the WGC BREF preparation process.
      Possible "technical reasons of operability or configuration" should be included in the paragraph on 'General considerations'.
- The equation for the oxygen correction is not applicable for waste gas streams with an oxygen level of 21 vol-%.

Information on which the split view is based

- Data collection for the drawing up of the WGC BREF.
- Background Paper for the Final TWG Meeting (30 April 2021).
- ROM REF.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- According to the data collection, there are plants with process furnaces/heaters using indirect heating that do not seem to be permitted with a reference oxygen level; the table below summarises relevant data collected on the reference oxygen level.

Main chemical activity	No. of EPs (total)*	No. of EPs reporting a reference oxygen level as permitted	Range of permitted reference oxygen level	Range/level of measured oxygen level	Type of fuel (No. of EPs)*
4.1 (a)	15	12	3 %	2.5 – 16	Other (16), multi-fuel (1)
4.1 (b)	2	1	3 %	8	Other (2)
4.1 (c)	3	1	3 %	No data	Natural gas (3)
4.1 (d)	6	5	3 %	3.2 -4.6	Natural gas (1), Other (5)
4.1 (f)	2	2	3 %	6.0 – 11.5	Natural gas
4.1 (h)	8	4	3 %	4.5 – 16.5	Natural gas (6)
4.1 (i)	1	No data	No data	No data	Natural gas
4.2 (c)	1	1	3 %	8	Natural gas
4.2 (d)	2	No data	No data	8	Natural gas, Other
4.2 (e)	45	13	15.0 – 20.2 %	14.8 – 20.7	Natural gas

* Differences might occur between 'No. of EPs (total)' reporting NO_X emission data and 'No. of EPs' reporting the type of fuel used, according to the information provided within the questionnaires.

As indicated in the table, a wide range of chemical activities were reported. Moreover, evidence from the data collected showed that the related characteristics and operating conditions vary significantly, as briefly summarised below:
  - total rated thermal input: within a range from less than 1 MW to 40 MW;
  - operating temperature: within a range from less than 180 °C to more than 1 350 °C;
  - operating times: in the range from less than 500 h/year to 8 760 h/year;
  - fuels: natural gas is typically used as fuel (70 EPs), followed by other fuels.

- For the main chemical activity 4.2 (e) in particular, the data collection shows measured oxygen content levels close to 21 % and process temperatures typically higher than 1 000 °C.
  For other main chemical activities, the measured oxygen content is in the range 2.5 % to 16.5 %.
- The application of the formula for the correction of oxygen level when oxygen enriched- air or pure oxygen is used is an implementation issue.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC, supported by CZ, fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
-	*To delete in the section 'General considerations' the reference oxygen level for process furnaces/heaters using indirect heating.*	*CEFIC, supported by CZ*	*NA*

4 GENERAL BAT CONCLUSIONS

4.1 Environmental management systems

4.1.1 Chemical management system as a feature of the EMS [CEFIC, ORGALIME, supported by CZ]

Conclusion of the Final TWG Meeting

[…] xxv. a chemical management system that includes an inventory of the hazardous substances and substances of very high concern used in the process(es). The potential for substitution of the substances that are listed in this inventory, focusing on those substances other than raw materials, is analysed periodically (e.g. annually) in order to identify possible new available and safer alternatives, with no or lower environmental impacts. *[…]*
Consolidated 'WGC Final Meeting conclusions' - Slide number: 48

Split view n. 4 - Split view summary[7]

CEFIC and ORGALIME, supported by CZ, propose to delete the conclusion to introduce a Chemical Management System (CMS) into BAT 1.

Summary of the rationale accompanying the split view

- CEFIC reported that the last-minute introduction of a CMS did not lead to a sound conclusion of the TWG. The conclusion, as written, will cause numerous problems for both operators and permitting authorities:
  - It will be difficult or impossible to avoid an overlap with REACH obligations of downstream users as described in Article 55 of the REACH Regulation.
  - Permitting authorities and plant operators will lack clarification on how to fulfil the requirement and avoid double work.
  - The conclusion provides no boundary between BAT 1 xxv and:
    - the obligations for work equipment (under 2009/104/EG);
    - the obligations for protection of the health and safety of workers from the risks related to chemical agents at work (according to 98/24/EC);
    - the obligation of Directive 2004/37/EC for the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
  - The chemical industry is the owner of ecotoxicity data and already provides these data to ECHA for REACH registrations.
  - The chemical industry provides ecotoxicity data for value chains and downstream users as SDS (Safety Data Sheet).

Information on which the split view is based

- No information provided.
  (CEFIC only reported that it was not possible to assess or react to the proposal submitted by SE/FI for a BAT on chemical management systems, which was uploaded in BATIS on 28/5/2021).

[7] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'Cefic Split View on BAT 1 Chemical Management System', see file: *Cefic SV CMS_BAT_1 final.pdf* .

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The supporting rationale seems aimed at addressing potential regulatory inconsistencies between a certain set of legislative acts in force, which goes beyond the remit of the process of drawing up the WGC BREF and the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC and ORGALIME, supported by CZ, does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the practical applications related to the adoption of chemicals management systems in chemical installations will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.2 Channelled emissions to air

4.2.1 General techniques

4.2.1.1 Description of BAT 5 [CEFIC, supported by CZ]

Conclusion of the Final TWG Meeting

BAT 5. In order to facilitate the recovery of materials and the reduction of channelled emissions to air, as well as to increase energy efficiency, BAT is to combine waste gas streams with similar characteristics, ~~limit~~ thus ~~optimise~~ minimising the number of emission points.

Description
The combined treatment of waste gases with similar characteristics ensures more effective and efficient treatment compared to the separate treatment of individual waste gas streams. ~~The extent to which the number of emission points can be limited depends on~~ The ~~optimisation~~ combination of waste gases is carried out considering plant safety (e.g. avoiding concentrations close to the lower/upper explosive limit), technical (e.g. compatibility of the individual waste gas streams, concentration of the substances concerned), environmental (e.g. maximising recovery of materials or pollutant abatement) and economic factors (e.g. ~~geographical~~ distance between different production units).
Care is taken that the combination of waste gases does not lead to the dilution of emissions.

Consolidated 'WGC Final Meeting conclusions' - Slide number: 62, 63.

Split view n. 5 - Split view summary[8]

CEFIC, supported by CZ, proposes to amend the description of BAT 5 to take cross-media effects into account, by adding in the text, at the end of the second sentence '…and cross-media effects (e.g. based on an assessment according EN 14040)'.

Summary of the rationale accompanying the split view

- One of the basic principles of the IED is to protect the environment as a whole. Shifting pollution from one environmental medium to another should be avoided. BAT 5 intends to cover this to some degree but falls short of one essential aspect: a reference to cross-media effects. As it is written right now, some aspects of such effects are in fact mentioned, but several are missing. This was widely discussed by the TWG but in the end, a less than optimal conclusion was found.
  The inclusion of 'cross-media effects' as proposed above follows the following rationale:
  - It is appropriate to provide for an integrated approach to prevention and control of emissions into air, water and soil, to waste management, to energy efficiency and to accident prevention.
  - The TWG decided to delete the words 'optimise' and 'optimisation'. Thus, the best option for the environment might not be chosen.
  - At some point cross-media effects outweigh the benefits of emission reduction due to diminishing returns and the additional need for resources like energy and reagents. As we have shown in our papers, there are examples where the detrimental effects supersede the emission reduction. This is especially the case but not limited to thermal waste gas treatment.
  - The use of the EN 14040 series (Environmental management – Life cycle assessment – Principles and framework) or similar tools to prove such outweighing effects are scientifically accepted and continuously improved.

[8] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'Cefic Split View on BAT 5 Cross Media Effects ', see file: *Cefic SV BAT 5 Cross Media_final.pdf.*

- The efforts required to prove these outweighing effects are comparatively high. The assessment is done for an individual and specific case taking various impact categories into account. A LCA might not be prepared by the company's own personnel. Support from experts or external scientists might be necessary. However, this ensures that the results can be validated. A tendency to a certain result can be excluded. There are tools publicly available. A detailed overview of impact assessment methods, software solutions and databases is provided in the CEFIC communication on Cross-Media Effects and Life Cycle Assessment based on a real-life example – Slides (uploaded in BATIS on 14/04/2021).
- The authority is not forced to accept the results of a LCA, even if the outcome supports higher emission values for a certain KEI. However, the results of the LCA allow data-based decision-making and enable the authorities to find the overall best solution.
- The proposal is based on the principles of the European Commission activities in pursuing standardisation and using the Product Environmental Footprint (PEF) categories. DG Environment has worked together with the European Commission's Joint Research Centre and other European Commission services towards the development of a harmonised methodology for the calculation of the environmental footprint of products and organisations. The final methods were published as an Annex to the Commission Recommendation on the use of common methods to measure and communicate the life cycle environmental performance.

Information on which the split view is based

- CEFIC's paper on cross-media effects (uploaded in BATIS on 30/01/2021).
- CEFIC-S355_20106_position on an integrated approch.pdf (under post 'CEFIC.zip', uploaded in BATIS on 12/03/2021).
- CEFIC's slides on Cross-Media Effects and Life Cycle Assessment based on a real-life example (uploaded in BATIS on 14/04/2021).
- CEFIC paper on Cross-Media Effects and Life Cycle Assessment based on a real-life example (uploaded in BATIS on 14/04/2021).
- Formacare Technical Paper_WGC BREF_final (uploaded in BATIS on 28/05/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The documents provided by CEFIC focus in particular on cross-media effects associated with the use of techniques/systems to treat waste gas streams. Therefore, it is not clear which would be the cross-media effects related to the combination of waste gas streams with similar characteristics.
  According to Commission Implementing Decision 2012/119/EU (Section 3.2.3), no cross-media effects will be mentioned unless they result in restrictions on applicability.
- Tools like a life cycle assessment according to EN 14040 may assist the implementation of an integrated waste gas management and treatment strategy and the selection of waste gas treatment techniques by an operator as demonstrated by the example plant [DE_290]. According to EN 14040, the depth and the breadth of LCA can differ considerably depending on the goal of each particular LCA.
- The focus of the Commission Recommendation (2013/179/EU) is to measure the life cycle environmental performance of products and organisations. A common method to measure the environmental footprint of waste gas treatment techniques is not yet available.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC, supported by CZ, does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the use of the life cycle assessment according to EN 14040 for assessing cross-media effects resulting from the selection of waste gas treatment techniques will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.2.2 Monitoring

Conclusion of the Final TWG Meeting

BAT 8. BAT is to monitor channelled emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.

[…]

([3]) The minimum monitoring frequency may be reduced to once every 3 years if the emission levels are proven to be sufficiently stable.

([3bis]) The minimum monitoring frequency may be reduced to once every year or once every 3 years if the emission levels are proven to be sufficiently stable.

[…]

~~([4]) The minimum monitoring frequency may be reduced to once every year if the emission levels are proven sufficiently stable.~~

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 67 to 81

4.2.2.1 Minimum monitoring frequency for CMR substances, including chloromethane [CEFIC, ORGALIME, supported by CZ]

Split view n. 6 - Split view summary[9]

CEFIC and ORGALIME, supported by CZ, propose not to delete the footnote ([3]) for all substances classified as CMR 1A/1B or CMR B and to also add footnote ([3]) to the line "CMR substances other than CMR substances covered elsewhere in this table", where the monitoring is associated with BAT 11.
As an alternative proposal, footnote ([3bis]) might be used.

Summary of the rationale accompanying the split view

- It is common monitoring practice for these substances/parameters to be measured every 1 or 3 years or even up to 5 years (according to the WGC QLIK Sense application). Overall, 38 % of all data for CMR substances report a monitoring frequency of "yearly" or "every 3 years".
- This has been well reflected in D1, the Background Paper for the Final TWG Meeting and the revised draft BATC (30 April 2021).
- There is no environmental benefit from additional monitoring of stable processes. Additional monitoring does not lead to lower emissions.
- The stability of processes may be demonstrated in various ways:
    - Repeatedly low results of emission monitoring may be used to demonstrate stable emissions (e.g. values up to 3 monitoring campaigns with 3 single measurements each).
    - In the meantime, between periodic measurements, frequent or continuous monitoring of process parameters may prove the stability of a process and functioning of the abatement system (e.g. pH value of a scrubber, pressure drop of a filter, visual inspections, temperature of thermal treatment or a combination of significant and reliable process parameters). This is common practice in Germany. All of course is in the judgement of the competent authority and part of the permit.

[9] Full versions available in BATIS, folder BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'Cefic Split View BAT 8 Monitoring Frequency CMR', see file: *Cefic SV Frequency CMR final.pdf.*

- Competent authorities need flexibility to set an appropriate monitoring frequency.
- A combined monitoring campaign for all relevant parameters would be more efficient.
- Proper monitoring at the highest expected emission state leads to a significant organisational effort for operators, measurement institutes and the competent authorities.
- In many cases, monitoring already has to be postponed for up to several months for a measurement representing the highest expected state of emissions due to the production schedule, especially for but not limited to batch processes.
- The additional measurements may also lead to additional emissions to demonstrate the highest expected state of emissions.
- A large number of additional measurement reports have to be checked by operators and competent authorities.
- There is no need for these additional measurements for a data collection for the next BREF revision.

Information on which the split view is based

- WGC QLIK Sense application (worksheet "Channelled Contextual" for substances classified as CMR 1A/1B or 2, as available at the time of submitting the split view).
- D1, BAT 8.
- Background Paper for the Final TWG Meeting, pp. 38-39, 42-43 (30 April 2021).
- Revised draft BATC (BAT 8)
- Comments provided on D1 (BAT 8).
- German TA Luft, Number 5.3.2.1, paragraph 3.

EIPPCB assessment

The documents and information on which the split view is based were available on time, except German TA Luft.

Validity of supporting rationale:

- There seems to be a mistake in the split view. The footnote deleted in the revised draft BATC referring to CMR 1 substances is footnote ([4]), not footnote ([3]).
- Considering all substances classified as CMR 1 (i.e. benzene, 1,3-butadiene, ethylene dichloride, ethylene oxide, formaldehyde and propylene oxide), the data collection shows the following monitoring frequencies:
    - every 3 years (103 instances);
    - twice a year (99 instances);
    - yearly (97 instances); and
    - other measurement frequencies (81 instances), e.g. 4 times a year (71 instances).
- BAT 8 only proposes minimum monitoring frequencies. The competent authorities may adapt the monitoring frequencies when deemed necessary based on local considerations or plant specificities (e.g. continuous monitoring of key process parameters, as for BAT 7, may be used to prove that emission levels are sufficiently stable).
  A similar approach, taking into account the hazard class of the substances, could be applied for the parameter 'CMR substances other than CMR substances covered elsewhere in this table'.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC and ORGALIME, supported by CZ, fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 8	*Not to delete footnote ([4]) for all substances classified as CMR 1A or 1B or CMR 2 and to also add footnote ([4]) to the substances/parameters "CMR substances other than CMR substances covered elsewhere in this table".*	*CEFIC and ORGALIME, supported by CZ*	*NA*

4.2.2.2 Minimum monitoring (and reporting) frequency for the mass flow [EEB]

Split view n. 7 - Split view summary[10]

EEB proposes to include, in BAT 8, minimum monitoring (and reporting) obligations in order to ensure that the mass flow thresholds are not exceeded.

Summary of the rationale accompanying the split view

- For EPs where the mass flow of a parameter has been shown to be below the mass flow threshold, periodic measurements are necessary to check that the mass flow remains in compliance with the threshold. If this is not monitored, there is a serious risk that installations, which fall below the mass flow threshold, may take their existing abatement systems out of use or reduce their efficiency.

Information on which the split view is based

- Comments provided on D1 (EEB-115, EEB-150).
- Comments provided on the revised draft BATC (EEB-13).
- 'EEB position paper on mass flow thresholds' (uploaded on BATIS on 24/03/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The split view does not refer to any technical, cross-media or economic justification.
- The compliance check with permit conditions including the monitoring of mass flows, when necessary, is a matter of implementation.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the practical application of the concept of 'minor emissions' and on the methodology or approach used to determine/calculate the mass flow values (including information on relevant monitoring frequency) will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

[10] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_BAT 8_monitoring MFT.docx.*

4.2.3 Organic compounds

4.2.3.1 Applicability of some techniques [IT]

Conclusion of the Final TWG Meeting

BAT 11. In order to reduce channelled emissions to air of organic compounds, BAT is to use one or a combination of the techniques given below.

Technique		Description	Applicability
a.	Adsorption	See Section 4.4.1	Generally applicable.
b.	Absorption	See Section 4.4.1	Generally applicable.
c.	Catalytic oxidation	See Section 4.4.1	Applicability may be restricted by the presence of catalyst poisons in the waste gases.
d.	Condensation	See Section 4.4.1	Generally applicable.
e.	Thermal oxidation	See Section 4.4.1	Applicability of recuperative and regenerative thermal oxidation to existing plants may be restricted by design and/or operational constraints. ~~Straight thermal oxidation is generally applicable.~~ Applicability may be restricted where the energy demand is excessive due to the low concentration of the compound(s) concerned in the process off-gases.
f.	Bioprocesses	See Section 4.4.1	Only applicable to the treatment of biodegradable compounds.

[…]

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Split view n. 8 - Split view summary[11]

Italy proposes to add a note to the "Applicability" column in BAT 11 stating that "the applicability may also be restricted according to BAT 23, BAT 25 and BAT 32". In addition, in the applicability related to catalytic and thermal oxidation, IT proposes to add the sentence "The technique may also be restricted for very low mass flow (e.g. less than 1 000 g/h)".

Summary of the rationale accompanying the split view

- BAT 23 (techniques c and i) and BAT 25 (technique c) state that in some cases there are additional restrictions for the applicability of BAT 11 (due to safety concerns), but this specificity is not recognised in BAT 11 (e.g. the applicability of thermal oxidation according to BAT 23 (technique c) may also be restricted for new plants).

[11] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *IT split view on BAT 11 - final version without comments .docx.*

- BAT 32 clarifies that BAT 11 is one of the two options to reduce emissions to air of organic compounds from polymers production. However, this is not recognised in BAT 11.
- The specific emission loads identified can provide a sufficient level of control on the emissions related to specific EPs (e.g. storage silos, finishing steps).
- BAT 16 presumes the inapplicability of catalytic and thermal oxidation for very low mass flows and for this reason the mass flow proposed in the draft BATC was deleted. However, this operation leads to the need for a corresponding specification in the applicability of the techniques.

Information on which the split view is based

- BAT 23, BAT 25 and BAT 32 as agreed in the Final TWG Meeting.
- Revised draft BATC (footnote ([3]) proposed in Table 4.4) and related EIPPCB assessment in the Background Paper for the Final TWG Meeting (30 April 2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- BAT applicability restrictions are typically related to the objective(s) addressed by the BAT itself.
- The objective of BAT 11 is to reduce channelled emissions, whereas the objective of BAT 23 is to reduce diffuse emissions.
- Technique c. 'Collecting diffuse emissions and treating off-gases' in BAT 23 sets an interface between diffuse and channelled emissions. Indeed, if technique c. were applicable, the diffuse emissions could be collected, vented and converted to channelled waste gases. In this case, the techniques to reduce channelled emissions of volatile organic compounds (i.e. BAT 11) and the associated applicability restrictions would need to be taken into consideration. Therefore, harmonisation of the applicability restrictions of BAT 11 and BAT 23 does not seem necessary.
- The interface between BAT 11 and BAT 32 is similar to the one explained in the previous bullet point. The techniques of BAT 32 are generally applicable. In this case, only the applicability restrictions of BAT 11 would need to be taken into consideration.
- No technical, cross-media or economic data were provided to justify why a mass flow of 1 000 g/h could be an applicability restriction for catalytic and thermal oxidisers. Moreover, it is not clear to what parameter/substance the proposed mass flow threshold of 1 000 g/h should refer.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of IT does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.2.3.2 Mass flow value in footnote (4bis) and footnote (8) [CEFIC, ORGALIME, supported by CZ and IT]

Conclusion of the Final TWG Meeting

Table 4.1: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds

[…]

(4bis) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 1A or 1B is below e.g. 1 g C/h).

[…]

(8) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. ~~2.5~~ 1 g/h).

[…]

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Split view n. 9 - Split view summary[12]

CEFIC and ORGALIME, supported by CZ and IT, propose to reinstate the initial threshold of 2.5 g/h for substances classified as CMR 1 A/B other than formaldehyde, to raise the mass flow threshold for formaldehyde to 5 g/h and to raise the mass flow threshold for the sum of VOCs classified as CMR 1A/B to 5 g/h accordingly.

Summary of the rationale accompanying the split view

- According to the EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting", pages 14, 16, 20 (uploaded in BATIS on 14/05/2021), for benzene, the threshold of 2.5 g/h already covered more the 93 % of the total emissions. Lowering the threshold covers an additional 3.6 % of emissions. For butadiene, the situation is almost the same: more than 91 % of the total emissions were covered, the lower threshold 'improves' the coverage by 3.2 %. For formaldehyde, the data indicate that lowering the threshold will cover an additional 0.38 % of the total emissions. In total numbers this means, assuming perfect abatement, a reduction of 5.6 g/h of a substance which occurs through natural processes.
- As the JRC had explained during the Final Meeting and as laid out in the Background Paper, there were no data on thresholds for CMR substances as a group. Hence conclusions were drawn in reference to single CMR 1 A/B substances for which data were available, such as those listed as examples above.
  The reasoning as laid out above hence also applies to the newly introduced mass flow thresholds for the sum of CMR 1 A/B substances (BAT 11, footnote (4 bis)).
  In addition, it is not clear why the threshold for a 'sum' of substances should be the same as for individual substances. Usually, the sum of parameters is higher than each individual parameter of an equation. In other words, it should have been common sense to apply a higher threshold for the sum of parameters.
  As the sum of VOCs classified as CMR 1 A/B includes substances like formaldehyde but also others with similar hazardous properties (threshold carcinogens), the mass flow threshold for the sum should be equal to or higher than 5 g/h.
- The reduction of the mass flow thresholds will now require operators and authorities to look at a larger number of units, causing additional administrative effort. Given the very low thresholds,

[12] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'Cefic Split View BAT 11 BAT 29 CMR Mass Flow Thresholds', see file: *Cefic SV BAT 11 BAT 29 CMR Mass Flow Thresholds FINALLY.pdf.*

the measurement uncertainties and inherent variability will have a more significant impact, meaning a more frequent 'exceedance' of thresholds, caused by these uncertainties.

Both the effects mentioned above will not lead to a further reduction of emissions, or, if any, given the small mass flows at issue, the reduction will be not relevant. It is more than doubtful that this will lead to a real and significant reduction of emissions.

Information on which the split view is based

- WGC QLIK Sense application.
- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" (uploaded in BATIS on 14/05/2021).
- D1.
- Background Paper for the Final TWG Meeting (30 April 2021).
- Comments provided on D1 (CEFIC-S381, CEFIC-S321).
- Comments provided on the revised draft BATC (CEFIC-54).
- CEFIC's papers on CMR substances (uploaded on BATIS on 30/01/2021 and 28/05/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- A value of 2.5 g/h for minor emissions of individual substances classified as CMR 1A or 1B, and of 5 g/h in the case of formaldehyde, could be based on the data collected, using the following criteria:
  a) The BAT-AEL should apply to all EPs whose aggregated mass flows represent at least 90 % of the total mass flow of the chemical sector.
  b) The level should be lower than or equal to the 20th percentile of all permit ELVs reported as mass flows.
  c) Proposed minor emission levels are harmonised with respect to hazard class.
- No data were collected for the parameter 'Sum of VOCs classified as CMR 1A or 1B', in line with the decisions agreed by the TWG at the KoM, and the decision taken at the Final TWG Meeting was based on expert judgment. Therefore, an alternative value could have been agreed on.
- Moreover, concerning emissions of CMR substances, according to the data collection, the share of diffuse emissions is in general significantly higher than the share of channelled emissions, as reported by the data collection. For example, in the case of 1,3-butadiene, the aggregated values of all questionnaires show that 104 tonnes are emitted as diffuse emissions versus 0.53 tonnes emitted as channelled emissions. In any case, minor emissions do not prevent competent authorities from adopting a stricter approach in particular cases.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC and ORGALIME, supported by CZ and IT, fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 11/Table 4.1	• *To increase the mass flow value for minor emissions of formaldehyde.*	*CEFIC and ORGALIME, supported by CZ and IT*	*5 g/h*
	• *To increase the mass flow value for minor emissions of substances classified as CMR 1A or 1B.*		*2.5 g/h*
	• *To increase the mass flow value for minor emissions for parameter 'Sum of VOCs classified as CMR 1A or 1B'.*		*5 g/h*

4.2.3.3 Mass flow value in footnote ([3]) [EEB]

Conclusion of the Final TWG Meeting

Table 4.1: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds
[…] ([3]) The BAT-AEL does not apply to minor emissions (i.e. when the TVOC mass flow is below e.g. 100 ~~200~~ g C/h) if no CMR substances are identified as relevant in the waste gas stream based on the inventory given in BAT 2. *[…]*
Consolidated 'WGC Final Meeting conclusions' - Slide number: 95

Split view n. 10 - Split view summary[13]

EEB proposes to decrease the value of the mass flow threshold for TVOC from 100 g/h to 10 g/h.

Summary of the rationale accompanying the split view

- The current threshold of 100 g C/h is an improvement compared to the value proposed in D1 (200 g/h, which meant that 81 % of EPs would have been below the threshold and exempted from BAT-AEL applicability), but still high to ensure an adequate coverage of the sector. We had proposed (EEB #8 on D1) to remove the threshold altogether. The final value of 10 g/h demanded is a compromise proposal, taking into consideration the positions of the Member State delegations, and in particular the calculations presented by the NL delegation during the Final Meeting where the value of 10 g/h was first proposed in order to obtain a good coverage of the sector.

Information on which the split view is based

- Comments provided on D1 (EEB-8, EEB-115).
- 'EEB position paper on mass flow thresholds' (uploaded on BATIS on 24/03/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The concept of the mass flow in the BAT conclusions agreed at the Final TWG meeting aims at distinguishing between major and minor sources and does not aim to cover a statistical percentage of the number of EPs of the data collection or to exclude EPs from the scope of the WGC BATC (as also explained in the Background paper for the Final TWG Meeting, several instances).
- The analysis of the data collection shows that 400 EPs (out of 973 EPs) reported no waste gas treatment for organic compounds. Out of these 400 EPs, 116 EPs are below 10 g/h and 150 EPs are in the range from 10 g/h to 100 g/h.

[13] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_MFT value for TVOC_table 4.1.docx.*

- EPs below a mass flow of 10 g TVOC/h contribute to 0.16 % of the total reported channelled emissions.

EIPPCB conclusion

The split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the practical application of the concept of 'minor emissions' and on the methodology or approach used to determine/calculate the mass flow values (including information on relevant monitoring frequency) will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.2.3.4 'Sum of VOCs classified as CMR 1A o 1B (or CMR 2)' [DE, AT]

Conclusion of the Final TWG Meeting

Table 4.1: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds

Substance/Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period) (12)	~~Mass flow threshold (g/h)~~
Total volatile organic carbon (TVOC)	< 1-20 (1) (2) (3) ~~(4)~~ ~~(5)~~ ~~(6)~~ (7)	~~200~~
~~Total volatile organic carbon (TVOC) containing substances classified as CMR 1A or 1B~~	~~< 1-5~~	~~2.5~~
~~Total volatile organic carbon (TVOC) containing substances classified as CMR 2~~	~~< 1-10~~	~~100~~
Sum of VOCs classified as CMR 1A or 1B	< 1-5 (4bis)	-
Sum of VOCs classified as CMR 2	< 1-10 (5bis)	-
Benzene	< 0.5-1 (8)	~~2.5~~
1,3-Butadiene	< 0.5-1 (8)	~~2.5~~
Ethylene dichloride	< 0.5-1 (8)	~~2.5~~
Ethylene oxide	< 0.5-1 (8)	~~2.5~~
Propylene oxide	< 0.5-1 (8)	~~2.5~~
Formaldehyde	1-5 (8)	~~2.5~~
Chloromethane	< 0.5-1 (9) (10) ~~(11)~~	~~100~~
Dichloromethane	< 0.5-1 (9) (10)	~~100~~
Tetrachloromethane	< 0.5-1 (9) (10)	~~100~~
Toluene	< 0.5-1 (9) ~~(10)~~ (10bis)	~~100~~
Trichloromethane	< 0.5-1 (9) (10)	~~100~~

[…]

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Split view n. 11 - Summary of DE and AT split view[14]

DE and AT propose to change 'Sum of VOCs classified as CMR 1A or 1B' and 'Sum of VOCs classified as CMR 2' to 'Total volatile organic carbon (TVOC) containing substances classified as CMR 1A or 1B' and 'Total volatile organic carbon (TVOC) containing substances classified as CMR 2', respectively.

AT, as an alternative, proposes to adjust the BAT-AEL range of the 'Sum of VOCs classified as CMR 1A or 1B" and "Sum of VOCs classified as CMR 2'.

Summary of the rationale accompanying the DE split view[14]

- If waste gas contains VOCs classified as carcinogenic, mutagenic or reprotoxic, best available techniques with a very high performance level should be used to minimise CMR 1A or 1B substances, and best available techniques with a high performance level should be applied for

[14] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *DE-Split view on BAT 11 Table 4.1.docx*; *AT Split view BAT11.docx*.

waste gases containing CMR 2 substances (see objective of the IED in recital 2 "prevent, reduce and as far as possible eliminate pollution arising from industrial activities").

- The data collection shows that best available techniques with a very high performance level can achieve TVOC emission values in the range of < 1-5 mg/Nm^3 applying the best designed thermal oxidation or regenerative thermal oxidation.
- The BAT-AEL proposed in Draft 1 of the WGC BREF (November 2019) for TVOC containing CMR 1A and 1B substances ("< 1 - 5 mg/Nm^3") reflects the BAT emission level justified for minimisation of toxic substances and also justified for processes where autothermal combustion can be achieved (combination with BAT 10).
- The upper end of the BAT-AEL range defined for the "Sum of VOCs classified as CMR 1A or 1B" and "Sum of VOCs classified as CMR 2" contradicts 5 mg/Nm^3 and 10 mg/Nm^3 respectively compared to the low BAT-AEL defined for single CMR substances.
- Where more than one substance of a CMR group is contained in the waste gas, an addition of BAT-AEL values up to 5 mg/Nm^3 and up to 10 mg/Nm^3 should not be allowed due to their CMR properties. Minimisation of CMR substances is a general requirement of the IED. DE proposed to add a footnote to the BAT-AELs of benzene, 1,3-butadiene, chloromethane, dichloromethane, ethylene dichloride, ethylene oxide, propylene oxide, tetrachloromethane, toluene and trichloromethane specifying that these BAT-AELs are sum parameters for one or more substances of each CMR group.

Summary of the rationale accompanying the AT split view[14]

- The questionnaires did not query the sum parameters 'Sum of VOCs classified as CMR 1A/1B' and 'Sum of VOCs classified as CMR 2' because the TWG decided at the Kick-off Meeting 'not to include CMR substances as a KEI group'. Therefore, no data are available to the TWG to decide on appropriate BAT-AEL ranges.
- Data for the parameters 'TVOC containing substances classified as CMR 1A or 1B' and 'TVOC containing substances classified as CMR 2' were requested in the questionnaires and therefore data to decide on appropriate BAT-AEL ranges are available.
- The BAT-AEL ranges for the 'Sum of VOCs classified as CMR 1A/1B' and 'Sum of VOCs classified as CMR 2', respectively, are equal to the BAT-AEL ranges proposed in the revised draft BATC for the parameters 'TVOC containing substances classified as CMR 1A or 1B' and 'TVOC containing substances classified as CMR 2', respectively. As already stated, the data for the 'Sum of VOCs classified as CMR' were not collected and are not comparable to 'TVOC containing substances classified as CMR'. Hence, a transposition of BAT-AELs to the newly introduced parameters might be an erroneous conclusion.
- Furthermore, the change of the parameters 'TVOC containing substances classified as CMR 1A or 1B' and 'TVOC containing substances classified as CMR 2' to 'Sum of VOCs classified as CMR 1A/1B' and 'Sum of VOCs classified as CMR 2', respectively, is a critical reduction in the substances covered in these parameters. It is not reasonable to substantially reduce the included substances and leave the BAT-AEL range at the proposed levels.

Information supporting DE split view

- Comments provided on D1 (DE-A49, DE-128, DE-A134).
- Comment provided on the revised draft BATC (DE-23).

Information supporting AT split view

- Kick-off Meeting and interim meeting report (Ref. Ares(2018)2525398 - 15/05/2018).
- D1.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- At the KoM the TWG concluded that CMR substances as a group are not KEI and data would not be collected for this group.
  However, the data collection indicates when the monitoring of TVOC or NMVOC may be associated with the presence of substances classified as CMR 1A or 1B and/or CMR 2.
- D1 referred to parameters 'Total volatile organic carbon (TVOC) containing substances classified as CMR 1A or 1B / CMR 2'.
- Comments provided on D1 expressed the need for more clarity regarding the link between VOCs classified as CMR 1A or 1B / CMR 2 and VOCs not classified as CMR 1A or 1B / CMR 2, since monitoring according to EN 12619 does not allow differing between the groups of non-CMR and CMR substances.
- According to the data collection, the majority of the thermal oxidisers reported average TVOC concentrations lower than 5 mg/Nm^3. Values from 5 mg/Nm^3 to 20 mg/Nm^3 were also reported by EPs applying regenerative thermal oxidisers. (Relevant information is summarised in the table below).

Type of thermal oxidiser	Average concentration < 5 mg/Nm^3			Average concentration 5 - 20 mg/Nm^3		
	TVOC	TVOC with presence of CMR 1	TVOC with presence of CMR 2	TVOC	TVOC with presence of CMR 1	TVOC with presence of CMR 2
Straight, recuperative, regenerative	93	17	10	19	5	4
Regenerative	24	5	3	8	2	0

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of AT and DE fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 11/Table 4.1	*To change the parameters as follows:* • *'Sum of VOCs classified as CMR 1A or 1B' to 'Total volatile organic carbon (TVOC) containing substances classified as CMR 1A or 1B';* • *'Sum of VOCs classified as CMR 2' to 'Total volatile organic carbon (TVOC) containing substances classified as CMR 2'.*	*AT and DE*	*NA*

4.2.3.5 BAT 11 – Table 4.1, footnotes (4^{bis}), (5^{bis}) and (^{8}) / BAT 14 - Table 4.3, footnotes (^{yy}) and (^{7}) [EEB]

Conclusion of the Final TWG Meeting

Table 4.1: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds

[…]

(^{4bis}) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 1A or 1B is below e.g. 1 g C/h).
(^{5bis}) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 2 is below e.g. 50 g C/h).

[…]

(^{8}) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. ~~2.5~~ 1 g/h).

[…]

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Table 4.3: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of dust, lead and nickel

[…]

(^{7}) The BAT-AEL does not apply to minor emissions (i.e. when the Ni mass flow is below e.g. 0.15 g/h).
(^{yy}) The BAT-AEL does not apply to minor emissions (i.e. when the lead mass flow is below e.g. 0.1 g/h).

[…]

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Split view n. 12 - Split view summary[15]

EEB proposes to delete footnotes (^{4bis}), (^{5bis}) and (^{8}) of Table 4.1 and footnotes (^{yy}) and (^{7}) of Table 4.3.

Summary of the rationale accompanying the split view

- These footnotes, relevant to the emissions of CMR substances, allow for the exemption of the BAT-AELs if a certain mass flow threshold is not exceeded. EEB has strongly objected to the concept of the mass flow thresholds (as a condition for the applicability of the BAT-AELs), especially when CMR substances are present in the waste gas stream.
  Since CMR substances are highly problematic and often accumulating in the environment, it is reasonable that small installations should also be within the BAT-AEL range. The data collection has shown that many plants below the thresholds comply with the BAT-AEL ranges.

Information on which the split view is based

- Comments provided on D1 (e.g. EEB-10, EEB-12).
- Comments provided on the revised draft BATC (EEB-4, EEB-5, EEB-6, EEB-7).

[15] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_tables 4.1 and 4.3_MFT for CMR.docx.*

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- Analysis of the results of the data collection for channelled emissions shows the following:
  - For substances classified as CMR 1A or 1B, the 20th percentile of the permitted mass flow thresholds is 2.5 g/h. A mass flow value of 25 g/h is the most reported one, followed by the values 2.5 g/h and 10 g/h.
  - For substances classified as CMR 2, the 20th percentile of the permitted mass flow thresholds is 100 g/h. A mass flow value of 100 g C/h is the most reported one, followed by the value 2 000 g C/h.
  - For nickel, the permitted mass flow thresholds are within the range 2.5 g/h to 5 g/h.

  Moreover, concerning emissions of CMR substances, according to the data collection, the share of diffuse emissions is in general significantly higher than the share of channelled emissions, as reported by the data collection.
- The indicative mass flow value set in the BATC does not prevent competent authorities from adopting a stricter approach wherever deemed relevant (e.g. IED, Article 18).
- A mass flow threshold for 'benzene' (i.e. 1 g/h) has been adopted by the LVOC BREF.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.2.3.6 Subtraction of methane emissions from the result of TVOC monitoring [CEFIC, supported by CZ]

Conclusion of the Final TWG Meeting

Table 4.1: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of organic compounds

[…]

(4bis) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 1A or 1B is below e.g. 1 g C/h).

(5bis) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the sum of the VOCs classified as CMR 2 is below e.g. 50 g C/h).

[…]

(8) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. ~~2.5~~ 1 g/h).

[…]

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Split view n. 13 - Split view summary[16]

CEFIC, supported by CZ, proposes to introduce in the table a footnote stating 'In case of significant methane content in the emissions, methane monitored according to EN ISO 25140 or EN ISO 25139 is subtracted from the result'.

Summary of the rationale accompanying the split view

- CEFIC comments (CEFIC-S177, CEFIC-S213) in the Background Paper for the Final TWG Meeting (page 51).
- EIPPCB assessment in the Background Paper for the Final TWG Meeting (page 57). However, for the right implementation, it is essential to provide clarity to operators and competent authorities, bearing in mind that in several MSs, requirements (BAT-AELs) are defined based on channelled emissions of Non-Methane Volatile Organic Compounds (NMVOC) instead of Total Volatile Organic Compounds (TVOC).
- There are several reasons why some (limited) methane emissions are unavoidable: a. coming from the feedstock, b. formed during the process, or c. when aiming at high destruction efficiencies in natural-gas-fired incinerators
- A similar footnote on large amounts of methane in TVOC is already included in the LVOC BREF (see Table 13.3 and Table 13.15).
- This kind of footnote will avoid misunderstanding in the implementation of this BAT.
- An overview of the EPs in the WGC QLIK Sense application that reported both NMVOC and TVOC (for LVOC units) shows that it is plausible that the differences between these numbers are due to the methane content. Not correcting for methane would de facto lead to a decrease of the BAT-AEL for operators reporting NMVOC by 41 %.
- The chemical industry has a limited contribution to the total methane emissions from industry (0.5 %, EPRTR). Nevertheless, the reduction of these emissions is taken very seriously; programmes have been implemented to further reduce these emissions, as explained in the position paper (e.g. process optimisation, LDAR or highly integrated equipment, reduced venting and flaring, etc.)

[16] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *Cefic SV_TVOC Methane final.pdf.*

Information on which the split view is based

- WGC QLIK Sense application.
- BP for the Final TWG Meeting.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The data collection shows that volatile organic compounds are monitored and that the parameters/substances measured are TVOC (978 EPs) and NMVOC (267 EPs).
- The data collection reports, for the same EPs, emission data as TVOC and NMVOC. NMVOC values are typically lower than TVOC values.
- A similar footnote was agreed on in the recently adopted LVOC BREF (BAT 86, Table 11.1, footnote ([3]).

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 11/Table 4.1	*To include a footnote, as follows:* *'In the case of significant methane content in the emission, the methane content monitored according to EN ISO 25140 or EN ISO 25139 is subtracted from the result'.*	*CEFIC*	*NA*

4.2.4 Inorganic compounds

Conclusion of the Final TWG Meeting

[…]

Table 4.4: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of NO_X ~~X~~ and indicative emission level for channelled emissions to air of CO from ~~the use of catalytic or thermal oxidation~~ thermal treatment

Substance/Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
Nitrogen oxides (NO_X) from catalytic oxidation	5 ~~10~~ -~~50~~ 30 ~~(3)~~ (4)	~~1 000~~
Nitrogen oxides (NO_X) from thermal oxidation	5 ~~10~~ ~~50~~ - ~~150~~ 130 ~~(3)~~ (1)	~~1 000~~
Carbon monoxide (CO)	No BAT-AEL (2)	~~Not applicable~~

(1) The upper end of the BAT-AEL range ~~is~~ may be higher and up to ~~250~~ 200 mg/Nm^3 if the process off-gas(es) contain(s) high levels of NO_X precursors.
(2) As an indication, the emission levels for carbon monoxide are 4-50 mg/Nm^3, as a daily average or average over the sampling period.
~~(3) The BAT-AEL does not apply when the NO_X mass flow is below 1 000 g/h.~~
(4) The upper end of the BAT-AEL range may be higher and up to ~~100~~ 80 mg/Nm^3 if the process off-gas(es) contain(s) high levels of NO_X precursors.

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 118, 119

4.2.4.1 Deletion of footnote (3) in Table 4.4 [IT]

Split view n. 15 - Summary of the IT split view[17]

IT proposes to reinstate footnote (3) in Table 4.4, for both thermal and catalytic oxidation, and to clarify in the introductory statement that BAT 16 refers to thermal treatment 'of waste gases'.

Summary of the rationale accompanying the split view

- The scope of the WGC BREF refers to almost all of the chemical sector, then the requirements refers to any chemical industry, even the very small ones, and any EP of it, even the irrelevant ones. This leads, in general, to the need to fix a threshold to any BAT-AEL requirement, to avoid the need for disproportionate control (and abatement) costs to meet IED requirements. This is generally recognised by the TWG that usually define such thresholds in the BAT conclusions.
- In the specific case of emissions from catalytic or thermal oxidation, it was decided in the Final TWG Meeting to eliminate such thresholds, assuming an implicit relevance of emissions due to the techniques used. However, in the applicability of those techniques, there is no mention of the relevance of the emissions.

[17] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *Split view IT BAT16 T4.4 note 3.docx*.

- According to the Italian legislation, the current formulation of the BAT can lead to the necessity to define (and control) an ELV coherent with the BAT-AEL for emissions occurring from any "thermal treatment" in the installation.
- In the Final TWG Meeting, the decision to delete the footnote was not supported by new data, but by consensus only.

Information on which the split view is based

- Proposal in D1 and EIPPCB assessment in the Background Paper for the Final TWG Meeting (30 April 2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- In the revised draft BATC, a NO_X mass flow value of 1 000 g/h was proposed to distinguish between minor and major contributors to channelled NO_X emissions, independently from the source of emissions.
- According to the data collection:
  - 162 EPs out of 282 EPs have a NO_X mass flow below 500 g/h. Out of these 162 EPs, 33 EPs (characterised by thermal oxidation) reported emission concentrations above 130 mg/m^3 and 4 EPs (characterised by catalytic oxidation) show concentrations above 30 mg/m^3 (Note: [CZ_18])(P1) is not considered as related to catalytic oxidisers due to the reported combustion temperature of 950 ºC).
- 'Thermal treatment', according to the definition provided in the revised draft BATC, refers to the treatment of waste gases using thermal or catalytic oxidation.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of IT fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 16/Table 4.4	*To introduce in Table 4.4 the following footnote, for both thermal and catalytic oxidation:* *'The BAT-AEL does not apply when the NO_X mass flow is below 1 000 g/h'.*	*IT*	-

4.2.4.2 Adjustment of footnote ([4]) in Table 4.4 [IT]

Split view n. 16 - Summary of the IT split view[18]

IT proposes to reinstate the value 100 mg/Nm³ in footnote ([4]) in Table 4.4 or to delete footnote ([4]), adding in the 'Concluding Remarks and Recommendations for Future Work' chapter of the WGC BREF a recommendation to collect information on the variability of NO_X emissions from thermal treatments (especially for catalytic oxidation) associated with the process off-gas(es) containing high levels of NO_X precursors.

Summary of the rationale accompanying the split view

- Data collected indicate that the value of 80 mg/Nm^3 could be problematic for NO_X emissions from thermal treatments (especially for catalytic oxidation) associated with the process off-gas(es) containing high levels of NO_X precursors. Therefore, a value of 100 mg/Nm^3 is more appropriate.
- In the Final TWG Meeting the decision to modify the value in footnote ([4]) was not supported by new data, but by consensus.
- Data analysis shows that the value of 80 mg/Nm^3 is consistent with an average performance level, but not as an emission limit value (where no exceeding is allowed in normal operating conditions), since a significant percentage of the measurements reported exceed it (almost 40 %).
- To reintroduce the previous value of 100 mg/Nm³ in footnote ([4]) in Table 4.4 is more coherent with the data collected; otherwise, it has to be explicitly recognised that the data collected cannot allow the determination of a BAT-AEL for the above-mentioned situation.

Information on which the split view is based

- Revised draft BATC and EIPPCB assessment in the Background Paper for the Final TWG Meeting (30 April 2021).
- Questionnaire related to the Italian plant IT_34 ((P11) measurements related to an EP using a catalytic oxidiser, associated with process off-gas(es) containing high levels of NO_X precursors; emission level with a maximum concentration of 147.70 mg/Nm^3; almost one third of the values are very close to 100 mg/Nm^3; only the average value of all measurements is below 80 mg/Nm^3).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The Italian plant IT_34 reported the treatment of vents from storage of acrylonitrile (which is a NO_X precursor) by catalytic oxidation. The maximum value reported for the EP (P11) is above 80 mg/Nm^3.

[18] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *Split view IT -BAT16 T4 n4.docx*.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of IT fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work 'chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 16/Table 4.4	*To modify footnote ([4]) as follows:* *([4]) The upper end of the BAT-AEL range may be higher and up to 100 mg/Nm^3 if the process off-gas(es) contain(s) high levels of NO_X precursors.*	*IT*	*NA*

4.2.4.3 Upper end of the BAT-AEL range for NO_X from thermal oxidation in Table 4.4 [CEFIC, supported by CZ]

Split view n. 17 - Split view summary[19]

CEFIC, supported by CZ, proposes to reinstate the value of 150 mg/Nm^3 as the upper end of BAT-AEL range for NO_X from thermal oxidation in Table 4.4.

Summary of the rationale accompanying the split view

- The combination of lowering the upper end of the BAT-AEL range is disproportional. Lowering the upper end of the BAT-AEL range from 150 mg/Nm^3 to 130 mg/Nm^3 reduces the absolute quantity of NO_X by 1 % (0.5 kg/h out of 55 kg/h related to EPs reported in the WGC QLIK Sense application, under optimal conditions). At the same time, the number of non-compliant EPs increases by 22 %.
- The main goal of a thermal oxidiser is to abate organic substances and not optimise NO_X emissions.
- The conclusion of an upper BAT-AEL range value of 130 mg/Nm^3 did not consider all aspects already indicated in the EIPPCB assessment reported in the Background Paper for the Final TWG Meeting (30 April 2021, pages 80 and 81). In the WGC QLIK Sense application, 209 data sets provided NO_X emission values. In the data set related to NO_X emissions from thermal oxidisers, there were a high number of continuous measurements, which could lower the average value.
- The deletion of a mass flow threshold in combination with the reduced upper end of the BAT-AEL range increases the number of incompliant EPs: the 80th percentile of all data is 170 mg/Nm^3.

Information on which the split view is based

- WGC QLIK Sense application.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The data collection includes 10 EPs associated with thermal treatment of organic compounds by thermal oxidation with emission levels within the range 130 mg/Nm^3 to 150 mg/Nm^3.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC, supported by CZ, fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work 'chapter of the BREF.

A possible formulation of this split view could be:

[19] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *Cefic SV BAT 16 ThOx final.pdf.*

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 16/Table 4.4	*To modify the upper end of the BAT-AEL range for NO_X from thermal oxidation.*	*CEFIC*	*150 mg/Nm^3*

4.2.4.4 BAT-AEL for channelled emissions to air of gaseous fluorides, expressed as HF [ES, CEFIC]

Conclusion of the Final TWG Meeting

[…]

Table 4.6: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of inorganic compounds ~~and indicative emission level for channelled CO emissions to air~~

Substance/Parameter	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
Gaseous fluorides, expressed as HF	~~<~~ ≤ 1-~~2~~ ([7])	~~5~~
[…] ([7]) The BAT-AEL does not apply to minor emissions (i.e. when the mass flow of the substance concerned is below e.g. 5 g/h). *[…]*		

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 128 to 131

Split view n. 18 - Split view summary[20]

- ES proposes to set a BAT-AEL range for channelled emissions to air of gaseous fluorides (expressed as HF) of < 1-2 mg/Nm^3 (same range proposed in Draft 1 of the WGC BREF).
- CEFIC proposes to add in Table 4.6 a footnote to the BAT-AEL for channelled emissions to air of gaseous fluorides (expressed as HF), in order to address the case of the production of CICPs when fluorine precursors are used, as follows:
  - *(zz) In the case of the production of CICPs, the upper end of the BAT-AEL range may be higher and up to 10 mg/Nm^3 if the process off-gas(es) contain(s) high levels of HF precursors.*

The split view is accompanied by the following rationales

Summary of the rationale submitted by ES

- The new BAT-AEL (< 1 mg/Nm^3) is not consistent with the production of CICPs, taking into account the variability of the HF emissions for each type of pigment due to fluoride compounds that could be contained in raw or secondary material and/or the use of HF precursors used for:
  - ensuring high-quality colour required, and
  - for reducing down to 500 ºC the calcination temperature.
- Variability of the emissions - The CICP sector has a current ELV of 5 mg/Nm^3 and to reduce it to 2 mg/Nm^3 will suppose an effort but could be achievable in some cases. However, to reduce the BAT-AEL to 1 mg/Nm^3 will be an unbearable effort for the CICP plants that use natural raw materials or secondary ones that might contain fluorine compounds at trace level and/or may use fluorine compounds as mineralisers (precursors).

[20] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *ES Split view_ BAT-AEL for HF (BAT 18).docx; CEFIC SV BAT 18_HF_ITC final.pdf*

Data reported in the Spanish questionnaires show a high variability in the HF emissions, also in plants with an abatement system (absorption) for HF (i.e. 'Alfarben' and 'Ferro' plants). As is shown in the following table, in 2017, the HF emissions reported by both plants were higher than previous years due to the great variability of fluoride composition in the feed raw materials for producing CICPs.

Plant	EP	Year	M1 mg/Nm^3	M2 mg/Nm^3	M3 mg/Nm^3
Alfarben (ES_74)	P1	2017	**3.50**	**3.90**	**5.30**
		2016	0.30	0.30	0.30
		2015	0.45	0.43	0.37
Ferro (ES_39)	P1	2017	**1.60**	**1.70**	**2.10**
		2016	0.81	0.54	0.18
		2015	0.24	0.16	0.14

- Cross-media effects - HF emissions are not measured continuously in the stack, but the pH and conductivity of the counter-current spray water are monitored in a continuous way. When the system registers an acid pH over the set point (pH < 6-6.5), a solution of NaOH is pumped into the water spray purification system. This alkaline solution increases the pH and the concentration of salts at the same time; this might cause a saturation of the solution. This saturation is monitored through the conductivity and when a certain value of conductivity is reached, the system generates an automatic purge of the system and sends the solution to the WWTP.
  In the case of wet scrubbers (absorption (alkaline)), it might happen that part of the fluoride retained in the alkali solution is carried over and emitted through the stack due to dragging.
  Operators try to achieve a balance between an efficient use of water consumption and keeping low HF emission values by:
  - purging the minimum amount of waste water possible;
  - complying with ELVs and at the same time with waste water discharge limits.

  In summary, to increase the efficiency of the scrubbers in order to achieve 1 mg HF/Nm^3 will have the following cross-media effects:
  - An increase of water consumption and, in some cases, this would require the enlargement of the WWTP. As an example, one Spanish plant currently consumes more than 200 m^3/day of water for the abatement system (scrubber) and more than 100 m^3/day of water discharges are generated. If the wet scrubber needs to operate at a higher abatement efficiency, this consumption and water discharge will increase.
  - Excessive dosing of NaOH reactive (or similar) to the water. This would lead to working at pH 9 or higher (instead of pH 7-7.5) and higher conductivity in the purge water of the scrubber.

- Costs associated with compliance with the BAT-AEL of HF - There will be excessive costs associated with higher efficiency rates in the scrubber:
  - The plant would need to control the operation of the scrubber, not by surrogate parameters such as pH, but by controlling the HF directly in the stack. The reason is that it is possible that such low levels of HF do not generate water with a pH below 6 and do not trigger the dosing of NaOH. This would entail a cost overrun in terms of equipment, energy consumption, consumables, labour, etc.
  - It would be necessary to add more NaOH to achieve 1 mg HF/Nm^3 in the stack. This will lead to a higher pH (above 9) in the purge water of the scrubber with high conductivity (+5 mS/cm). Our pigment plants have a WWTP with indirect discharge to the municipal WWTP. This municipal WWTP has pH (9) and conductivity (3 mS/cm) limitations. So the municipal WWTP will not accept water discharges from pigment plants. There are two alternatives for the treatment of these water discharges:
    - Waste water could be sent to other WWTPs by truck: this would mean an average of 5-6 tanker trucks per day (including weekends), with the consequent indirect emissions associated with the transport and the impacts derived from the management itself.

        - To install an evaporator at the end of the line, but these systems demand high energy consumption and it is also necessary to consider the management of the concentrated rejection of hazardous waste generated that would also have to be quantified and assessed to see whether the installation as a whole meets the requirements of being BAT.
    - Nowadays the whole wet scrubber, although it is automatic, is operated by the following human resources, which probably will be increased to comply with a stringent ELV:
        - 1 operator working full time (8 hours/day, from Monday to Friday) in the WWTP and scrubber;
        - 1 maintenance worker who controls all the technical parts of the plant daily;
        - 1 maintenance worker on each shift (mornings/afternoons/evenings) for 20-30 minutes daily doing extraordinary checks;
        - 1 maintenance supervisor who controls registers and conclusions of the daily checks made by his crew and the analytical results.

Summary of the rationale submitted by CEFIC

- Information provided on HF emissions during the WGC BREF development process - During the WGC BREF development process, CICP companies reported technical information through the data collection (questionnaires). In those cases where the information from the questionnaires was not sufficient due to lack of representativeness, specific technical reports were developed to reinforce the shortcomings of the data collection.
  Regarding the situation of the sector in terms of HF emissions, 4 reports were prepared (references reported later on in this section). The content of these comprehensive reports focuses on explaining the origin of HF emissions in the CICP sector, trying to justify the need to use HF precursors to manufacture certain pigments and, therefore, requesting the inclusion of a dedicated footnote to Table 4.6, with the aim of covering this situation and ensuring a compromise between environmental protection and pigment manufacturing scenarios.

- HF precursors in the CICP sector - In the CICP sector, the use of HF precursors is a necessity for the manufacturing of some specific pigments and this depends mainly on the company's product portfolio. HF precursors are salts that react as a catalyst with raw material pigments during the calcination process and allow the achievement of the final structure and a chromatic development that cannot be obtained without them.
  A positive cross-media effect deriving from the use of HF precursors is the reduction of the calcination temperature to obtain the final product, in some specific cases down to 500 ºC, which means less consumption of natural gas and consequently less CO_2 emissions.
  For all mentioned arguments, the emission of HF in the CICP is quite variable as has been explained in comprehensive reports uploaded in BATIS in February 2020, February 2021 and May 2021.

- Representativeness of HF emissions in the CICP sector - HF emission data reported from the CICP sector is not representative of the different chemical raw materials' profile composition. This lack of representativeness in the data collection is due to the following reasons:
    - The questionnaire was restricted to include only a limited amount of data from mandatory environmental inspections, as they had to be validated by the correspondent competent bodies. Official inspections did not cover all production scenarios (frequency of inspections: once every 2 or 3 years for the period of collecting data for the questionnaires).
    - It is not possible to filter data according to "use of precursors" because this information was not requested or included in the questionnaire.

  To overcome this lack of information, extra data from self-controlled campaigns performed by companies have been provided by the pigment sector (information uploaded on BATIS in May 2021).

- Best Available Techniques implemented in the CICP sector for HF abatement - The data compiled in the report from May 2021 show high concentrations up to 250 mg/Nm^3 before the abatement system was installed. High HF values are associated with:
    - the use of raw materials with traces of fluorine;

- the use of HF precursors as a mineraliser; and
- the calcination temperature, considering that HF emissions become relevant above 950 ºC.

The abatement systems installed to remove HF are:

- wet absorption (alkaline), and
- dry absorption (solid reagent injection in combination with a dust abatement technique).

In some cases, the process off-gases containing very high levels of HF prior to treatment with absorption units do not ensure the achievement of the BAT-AEL proposed considering at the same time cross-media effects:

- increase of water consumption, retrofitting of the WWTPs and an excessive dosing of NaOH for wet absorption;
- increase of dust emissions in the case of solid reagent injection and an increase of the waste generated as a consequence of the dry absorption.

Information supporting ES split view

- Questionnaire "ES_Alfarbensa_Alfarben_up1mw_v1+non-CBI".
- Questionnaire "ES_Ferrospain_Ferroon1mw_v1+non-CBI".

Information supporting CEFIC split view

- Action taken by ANFFECC as a response to the conclusions of the WGC II Data Workshop (uploaded in BATIS on 30/01/2021).
- Support paper for CEFIC Comments: HF emissions in the context of WGC BREF (uploaded in BATIS on 12/03/2020).
- HF emissions in the context of WGC BREF (uploaded in BATIS on 12/03/2020).
- HF emissions in the CICP sector: An overview of the relevant aspects to consider when deriving BAT-AELs (uploaded in BATIS on 28/05/2021)

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The data collection includes two EPs, applying 'absorption', with a HF mass flow above 5 g/h, reporting the following HF emission levels (in concentration):
  - [ES_39](P1): average 0.8 mg/Nm^3 and maximum 2.1 mg/Nm^3;
  - [ES_74](P1): average 1.6 mg/Nm^3 and maximum 5.3 mg/Nm^3.
- The abatement efficiency for the 'absorption' (wherever reported within the questionnaires) typically ranges from 95 % to nearly 100 %. By way of example, assuming an inlet HF concentration of 200 mg/Nm^3 in the waste gas stream, an abatement efficiency of 95 % would lead to an emission level of 10 mg/Nm^3. Therefore, to achieve a HF concentration value of around 1 mg/Nm^3, the abatement efficiency would need to be higher than 99.5 %.
- The supporting paper[21] submitted by CEFIC highlights, in particular, the following information:
  - fluorinated raw materials represent between 0.01 % and 0.14 % of the total raw materials; the average content of fluorine in the raw materials may vary from 0.006 % to 60 %;

[21] Document available in BATIS, folder: 14 Final Meeting > 03 TWG Feedback on BP and revised BATC, post 'Cefic supporting paper 5 - pigment sector - processes descriptions and rational for HF emissions', file *C212305.pdf*.

- results of additional measurements of HF emissions before and after treatment, with and without HF precursors, for five CICP furnaces[22];
- when using raw materials without HF precursors, the concentration in the waste gas is in the range from 25 mg/Nm^3 to 40 mg/Nm^3 and after treatment (by absorption / adsorption / filtration) below 1 mg/Nm^3;
- when using raw materials with HF precursors, the concentration in the waste gas is in the range from 200 mg/Nm^3 to 250 mg/Nm^3 and after treatment (by absorption / adsorption / filtration) in the range from 1 mg/Nm^3 to 20 mg/Nm^3.

- The ES rationale includes technical, cross-media and economic information relevant to determine the characteristics of the CICP production processes. ES also reported that the CICP sector has a current ELV of 5 mg/Nm^3.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of ES and CEFIC fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 18/Table 4.6	*To modify the BAT-AEL range for HF.*	*ES*	*< 1-2 mg/Nm^3*
	To add a footnote as follows: *In the case of the production of complex inorganic pigments, the upper end of the BAT-AEL range may be higher and up to 5 mg/Nm^3 if the process off-gas(es) contain(s) high levels of HF precursors.*	*CEFIC*	*NA*

[22] Furnaces are not identified by plant name.

4.2.5 Dust (including PM_{10} and $PM_{2.5}$) and particulate-bound metals

4.2.5.1 Mass flow value in footnote ([2]) [EEB]

Conclusion of the Final TWG Meeting

[...]

Table 4.2: BAT-associated emission levels (BAT-AELs) for channelled emissions to air of dust, lead and nickel

Substance/Parameter	BAT-AEL (mg/Nm³) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
Dust	< 1-5 ~~([1])~~ ([1bis]) ([2]) ~~([3])~~ ~~([4])~~ ([5]) ~~([6])~~ ([xx])	~~100~~
~~Dust containing substances classified as CMR 1A or 1B~~	~~< 1-2.5~~	~~2.5~~
~~Dust containing substances classified as CMR 2~~	~~< 1-2.5~~	~~15~~
Lead and its compounds, expressed as Pb	< 0.01-~~0.5~~ 0.1 ([yy])	~~0.15~~
Nickel and its compounds, expressed as Ni	< 0.02-~~0.5~~ 0.1 ([7])	~~0.15~~

~~([1]) The upper end of the range is 20 mg/Nm³ when an absolute or fabric filter is not applicable.~~

([1bis]) The upper end of the range is 20 mg/Nm³ when neither an absolute nor a fabric filter is not applicable.

([2]) The BAT-AEL does not apply to minor emissions (i.e. when the dust mass flow is below e.g. ~~100~~ 50 g/h) if no CMR substances are identified as relevant in the dust based on the inventory given in BAT 2.

~~([3]) The upper end of the BAT-AEL range is 2.5 mg/Nm³ if both of the following conditions are fulfilled:~~
- ~~the presence of substances classified as CMR 1A/1B in the dust is identified as relevant (see BAT 2);~~
- ~~the dust mass flow is above 2.5 g/h.~~

~~([4]) The upper end of the BAT-AEL range is 2.5 mg/Nm³ if both of the following conditions are fulfilled:~~
- ~~the presence of substances classified as CMR 2 in the dust is identified as relevant (see BAT 2);~~
- ~~the dust mass flow is above 15 g/h.~~

([5]) In the case of the production of complex inorganic pigments using direct heating, and in the case of the drying step in the production of E-PVC, the upper end of the BAT-AEL range may be higher and up to ~~15~~ 10 mg/Nm³.

~~([6]) In the case of water-soluble inorganic salts, the upper end of the BAT-AEL range may be higher and up to 20 mg/Nm³.~~

([xx]) Dust emissions are expected to be towards the lower end of the BAT-AEL range (e.g. below 2.5 mg/Nm³) when the presence of substances classified as CMR 1A or 1B, or CMR 2 in the dust is identified as relevant (see BAT 2).

([7]) The BAT-AEL does not apply to minor emissions (i.e. when the Ni mass flow is below e.g. 0.15 g/h).

([yy]) The BAT-AEL does not apply to minor emissions (i.e. when the lead mass flow is below e.g. 0.1 g/h).

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 108 and 109

Split view n. 14 - Split view summary

EEB proposes to decrease the value of the mass flow threshold for dust from 50 g/h to 20 g/h.

Summary of the rationale accompanying the split view[23]

- The current threshold of 50 g/h is an improvement compared to the value proposed in D1 (100 g/h, which meant that 93 % of EPs would have been below the threshold and exempted from BAT-AEL applicability), but still high to ensure an adequate coverage of the sector. EEB

[23] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *EEB split view_MFT value for dust_table 4.3.docx*

proposed a threshold of 1 g/h (EEB comment #24 on Draft 1 of the WGC BREF), which would result in only 34 % of EPs' exemption from BAT 14. The final value of 20 g/h demanded during the Final Meeting is a compromise proposal, taking into consideration the positions of the Member State delegations.

Information on which the split view is based

- EEB comments on the draft BAT conclusions (EEB comment #24 on Draft 1 of the WGC BREF, November 2019).
- EEB comments on draft BAT conclusions (Draft 1 of the WGC BREF, November 2019), e.g. #115, are urging the EIPPCB to abandon the concept of mass flow thresholds (as a condition for the applicability of the BAT-AELs).
- EEB position paper on mass flow thresholds (24/03/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The concept of the mass flow aims in the BAT conclusions agreed at the Final TWG meeting at distinguishing between major and minor sources and does not aim to cover a statistical percentage of the number of EPs of the data collection or to exclude EPs from the scope of the WGC BATC (as also explained in the Background paper for the Final TWG Meeting, several instances).
- The data collection also shows that 238 EPs (out of 1638) reported no waste gas treatment. Of these, 181 EPs are below 20 g/h and 27 EPs are in the range from 20 g/h to 50 g/h.
- The data collection shows that EPs below a mass flow of 50 g dust/h contribute to 7.8 % of the total reported channelled emissions and that a mass flow of 50 g dust/h is lower than the 20th percentile of all mass flow values reported.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the practical application of the concept of 'minor emissions' and on the methodology or approach used to determine/calculate the mass flow values (including information on relevant monitoring frequency) will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.3 Diffuse VOC emissions to air

4.3.1 Management system for diffuse VOC emissions

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[…]

- Maintenance and/or repair actions ~~Definition of a VOC concentration threshold above which equipment maintenance is~~ to be carried out. A typical criterion could be a VOC concentration threshold triggering the maintenance or repair action (maintenance/repair threshold). The maintenance/repair threshold is generally equal to or higher than the leak threshold ~~but~~. This depends on the characteristics of the emission source (e.g. accessibility) and the hazardous properties of the emitted substance(s). For the first LDAR programme, it is generally not higher than ~~10 000~~ 5 000 ppmv for VOCs other than VOCs classified as CMR 1A or 1B, and 1 000 ppmv for VOCs classified as CMR 1A or 1B. For subsequent LDAR programmes, the maintenance/repair threshold is lowered (see point vi. a.) and not higher than 1 000 ppmv for VOCs other than VOCs classified as CMR 1A or 1B, and 500 ppmv for VOCs classified as CMR 1A or 1B, targeting 100 ppmv.

[…]

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4.3.1.1 Distinction between CMR 2 substances and other non-CMR substances [EEB]

Split view n. 19 - Split view summary[24]

EEB proposes to change the wording of BAT 19 (iii) (b) as follows:

- *For the first LDAR programme, it is generally not higher than 5 000 ppmv for VOCs other than VOCs classified as CMR 1A/1B or CMR 2, and 1 000 ppmv for VOCs classified as CMR 1A/1B or CMR 2. For subsequent LDAR programmes, the maintenance/repair threshold is lowered (see point vi. a.) and not higher than 1 000 ppmv for VOCs other than VOCs classified as CMR 1A/1B or CMR 2, and 500 ppmv for VOCs classified as CMR 1A/1B or CMR 2, targeting 100 ppmv.*

Summary of the rationale accompanying the split view

- CMR 2 substances are suspected carcinogens, mutagens or reproductive toxicants based on (even limited) evidence from animal and/or human studies. Based on the precautionary principle, we believe that the stricter regime applying to CMR 1A/1B substances should apply to CMR 2 substances as well.

Information on which the split view is based

- None provided.

EIPPCB assessment

Validity of supporting rationale:

- No technical rationale has been provided to support the split view.

[24] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see files: *EEB split view_BAT19_CMR2.docx*.

- Annex II to the IED refers to substances and mixtures which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction.
- CMR 2 refers to suspected carcinogens, mutagens or reproductive toxicants based on limited evidence from animal and/or human studies; whereas CMR 1A refers to known carcinogens, mutagens or reproductive toxicants based on human evidence and CMR 1B refers to presumed carcinogens, mutagens or reproductive toxicants based on animal studies.
- According to the data collection, the maintenance thresholds of substances classified as CMR 2 seemed to be more aligned with substances not classified as CMR. The data collection does not generally differ between the maintenance repair thresholds for the first and subsequent LDAR programmes.

Maintenance/ Repair threshold	5 000 ppmv	1 000 ppmv	500 ppmv	350 ppmv	< 100 ppmv
TVOC	93	117	33	6	11
CMR1	12	54	48	3	8
CMR2	No data	45	12	6	No data

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.3.2 Words ‘targeting 100 ppmv’ [CEFIC, supported by CZ and IT]

Split view n. 20 - Split view summary[25]

CEFIC (supported by CZ and IT) proposes to delete the phrase ‘targeting 100 ppmv’.

Summary of the rationale accompanying the split view

- A level of 100 ppmv cannot be the target for a maintenance/repair threshold level as it is technically extremely hard to achieve, especially in the case of rotating equipment. A target level of 100 ppmv would lead to intensive and costly maintenance measures as it would basically mandate the use of high-integrity equipment.

Information on which the split view is based

- WGC QLIK Sense application (Worksheet ‘LDAR Thresholds’).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- As shown in the table reported in the previous section of this document (i.e. Section 4.3.1.1), the majority of the data for substances classified as CMR 1A or 1B reported repair/maintenance thresholds higher than 100 ppmv. Few data points refer to repair/maintenance thresholds equal to or lower than 100 ppmv.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC, supported by CZ and IT, fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the ‘Concluding remarks and recommendations for future work’ chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 19	*To delete the phrase ‘targeting 100 ppmv’.*	*CEFIC, supported by CZ and IT*	*NA*

[25] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *Cefic SV BAT 19 Maintenance Threshold final.pdf*.

4.3.3 Monitoring

4.3.3.1 Monitoring frequency in footnote (4) [SE]

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[…]

Type of sources of diffuse VOC emissions (1) (2)	Type of VOCs	Standard(s)	Minimum ~~measurement~~ monitoring frequency
Sources of fugitive emissions	VOCs classified as CMR 1A or 1B	EN 15446	Once every year (3) (4) (2bis)
	VOCs not classified as CMR 1A or 1B		Once ~~every~~ during the period covered by each LDAR ~~campaign~~ programme (see BAT 19 point iii.) (2ter)
Sources of non-fugitive emissions	VOCs classified as CMR 1A or 1B	No EN standard available	Once every year
	VOCs not classified as CMR 1A or 1B		Once every ~~5~~ year~~s~~ (5)

(1) The ~~measurements~~ monitoring only appl~~i~~es to emission sources that are identified as relevant in the inventory given in BAT 2.

(2) The ~~measurements~~ monitoring does not apply to ~~high-integrity equipment (see BAT 23 d.) or to~~ equipment operated under subatmospheric pressure.

(2bis) In the case of high-integrity equipment (see BAT 23 d.) in contact with VOCs classified as CMR 1A or 1B, a lower minimum monitoring frequency may be adopted, but in any case at least once every 5 years.

(2ter) In the case of high-integrity equipment (see BAT 23 d.) in contact with VOCs other than VOCs classified as CMR 1A or 1B, a lower minimum monitoring frequency may be adopted, but in any case at least once every 8 years.

(3) In the case of inaccessible sources of fugitive VOC emissions (e.g. if the ~~measurements~~ monitoring requires the removal of insulation or the use of scaffolding), the ~~measurements~~ monitoring frequency may be reduced to once ~~every~~ during the period covered by each LDAR ~~campaign~~ programme (see BAT 19 point iii.).

(4) For the production of PVC, the minimum monitoring frequency may be reduced to once every 5 years if the plant uses VCM gas detectors ~~permanently installed on site~~ to continuously monitor VCM emissions in a way that allows an equivalent level of detection of VCM leaks.

(5) The minimum monitoring frequency may be reduced to once every 5 years if non-fugitive emissions are quantified by using measurements.

[…]

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Split view n. 21 - Split view summary[26]

SE proposes to delete the exemption in footnote (4) where the minimum monitoring frequency may be reduced to once every 5 years if the plant uses VCM gas detectors.

[26] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *SE split view_BAT 22_footnote 4 monitoring frequency.docx*.

Summary of the rationale accompanying the split view

- VCM gas detectors cannot replace LDAR to monitor fugitive emissions. No data were collected that show that gas detectors can find leakages of VOCs in a way that is comparable to LDAR where the monitoring is done in direct contact with the equipment.
- VCM gas detectors are used for health and safety purposes and are therefore placed in areas of the installation where there is a likelihood that people will be exposed to potential leaks. They are not placed in well-ventilated areas where people are not present. The gas detectors will therefore not cover the whole installation; thus, a lot of the leaks will go undetected.
- The leak detection depends on the location of the VCM gas detector and the distance to the equipment and in open systems on meteorological factors such as wind direction.

Information on which the split view is based

- Comment provided by FR on the revised Draft BATC (FR-36).
- FR document 'LDAR for PVC production sites' (uploaded in BATIS on 07/06/2021).
- SE document 'Proposal on BAT 22' (uploaded in BATIS on 28/06/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- Information on the use of VCM gas detectors was provided during the site visits in BE/NL/DE (e.g. by Plant [DE_337]). The plant reported that VCM in the atmosphere is monitored by 22 VCM gas detectors in the PVC plant, with a limit of detection of 0.1 ppm in order to detect leaks and react immediately. The LDAR programme of the plant [DE_337] includes 4 500 measurement points for the PVC plant and 22 000 for the VCM plant, which are measured once every 5 years. The plant reported that since 2017 two measurements above a repair threshold of 1 000 ppm had occurred, which triggered immediate action.
- Considering local factors, such as whether the equipment of the plant is indoors or outdoors, how to perform the most suitable type of emission monitoring to ensure an equivalent level of detection of VCM leaks is a matter of implementation.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of SE does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

4.3.3.2 Not to refer to SOF and DIAL as BAT [BE, SE, EEB]

Conclusion of the Final TWG Meeting

[…]

Note

Optical gas imaging (OGI) is a useful complementary technique to the method EN 15446 ('sniffing') in order to identify sources of fugitive ~~diffuse~~ VOC emissions and is particularly relevant ~~to identify~~ in the case of inaccessible sources (see Section 4.4.2).

In the case of non-fugitive emissions, measurements may be complemented by the use of thermodynamic models.

Where large amounts (e.g. above 80 t/yr) of VOCs are handled used/consumed, the quantification of ~~total~~ VOC emissions from the plant with tracer correlation (TC) or with optical absorption-based techniques, such as differential absorption light detection and ranging (DIAL) or solar occultation flux (SOF), is a useful complementary technique (see Section 4.4.2).

[…]

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Split view n. 22 - Split view summary[27]

BE, SE and EEB propose to modify the last sentence in the 'Note' relating to BAT 22 as follows:

- *"Where large amounts (e.g. above 80 t/yr) of VOCs are used/consumed, it is BAT to periodically quantify ~~the quantification of~~ VOC emissions from the plant with tracer correlation (TC) or with optical absorption-based techniques, such as differential absorption light detection and ranging (DIAL) or solar occultation flux (SOF)~~,is a useful complementary technique~~ (see Section 4.4.2)."*

Summary of the rationale accompanying the split view

- Putting this information in a note will probably not often lead to implementation in practice.
- Writing it as a BAT would lead to implementation. By specifying the frequency as "periodically", some flexibility is left for the competent authorities to decide on with which frequency these techniques need to be performed.
- There is no added value compared to what is already in the CWW BREF, BAT 5, on SOF and DIAL.
- Operational data - DIAL and SOF have been operated for measurements of diffuse VOC emissions at numerous industries, +300 (refineries and chemical industry), in many areas of the world including Sweden, Norway, France, the Netherlands, Belgium, Texas, California, China and Korea. In Sweden, SOF has been applied once every year or once every 2 years at the major petrochemical and refinery industries since 2005.
- SOF and DIAL are valuable techniques to estimate diffuse emissions as a whole. They would contribute to the prevention and reduction of diffuse VOC emissions.
- Two extensive SOF campaigns performed in BE (Flanders, Port of Antwerp and Zwijndrecht) in 2010 and 2016, covering a wide range of chemical and petrochemical installations, proved very useful. Both SOF and DOAS (differential optical absorption spectroscopy) were performed.

[27] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *BAT 22_split view on SOF and DIAL_final.docx*.

- The typical uncertainty of SOF measurements stays within 30 % (see slide 38 of Presentation of the results of the study "SOF campaign 2016" from BE, submitted on BATIS, with a summary of nine SOF validation experiments).
- Within CEN WG 38 TC 264, the techniques are being standardised.

Information on which the split view is based

- Comments provided on D1 (BE-158, SE-53).
- BE document 'SOF campaign 2010' (uploaded on BATIS on 26/03/2018).
- BE document 'SOF campaign 2016' (uploaded on BATIS on 26/03/2018).
- BE document 'Presentation of the results of the study SOF campaign 2016' (uploaded on BATIS on 26/03/2018).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- Two SOF (Solar Occultation Flux) campaigns were commissioned by the Flemish environmental inspectorate (2010 & 2016). The overall aim of the studies was to establish an overview of the total VOC emissions of all major chemical plants in Antwerp Harbour (and Zwijndrecht in 2016), in order to get an estimation of the emission magnitudes. The on-site measurements aimed to identify hotspot emissions and improve understanding of the source origin of observed emissions. Emission estimates are reported in the 2016 study on the following:
  - via SOF: alkanes, ethylene, propylene and ammonia;
  - via DOAS (Differential Optical Absorption Spectroscopy): SO_2, NO_2 and formaldehyde.
- According to CEN, a prEN 17628 'Fugitive and diffuse emissions of common concern to industry sectors – Standard method to determine diffuse emissions of volatile organic compounds into the atmosphere' (December 2020) is under approval (tentative date of availability: 30/06/2022).
- The prEN 17628 includes an overview of measurement methods: Differential Absorption Lidar (DIAL), SOF, Tracer Correlation (TC), Optical Gas Imaging (OGI and Reverse Dispersion Modelling (RDM).
- According to the above-mentioned draft standard, the measurement methods DIAL and SOF allow the determination of (fugitive and/or non-fugitive) emissions from the entire site as well as from equipment (e.g. silo farm). Therefore, SOF and DIAL may be considered as useful monitoring methods for sources of non-fugitive emissions, for which a periodic minimum monitoring frequency has been concluded.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of BE, SE and EEB fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. The split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 22	To add a footnote to the table as follows: 'An EN standard to determine VOC fugitive and non-fugitive emissions into the atmosphere, including DIAL and SOF techniques, is under development' *(at the time of the publication of these BAT Conclusions)*	BE, SE and EEB	*NA*

Moreover, it will be explicitly mentioned in the same chapter that the prEN 17628 'Fugitive and diffuse emissions of common concern to industry sectors – Standard method to determine diffuse emissions of volatile organic compounds into the atmosphere' (December 2020) is under approval by CEN (tentative date of availability: 30/06/2022).

4.3.4 Prevention or reduction of diffuse VOC emissions

Conclusion of the Final TWG Meeting

BAT 23. In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to use a combination of the techniques given below with the following order of priority.

Note
The use of techniques to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air is prioritised according to the hazardous properties of the emitted substance(s) and/or the significance of the emissions.

Technique		Description	Type of emissions	Applicability
~~*Fugitive emissions and non-fugitive emissions*~~ *1. Prevention techniques*				
a.	Limiting the number of emission sources	This includes: • minimising pipe lengths; • reducing the number of pipe connectors (e.g. flanges) and valves; • using welded fittings and connections; • using compressed air or gravity for material transfer.	Fugitive and non-fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants.
~~d.~~ b.	Use of high-integrity equipment	High-integrity equipment includes, but is not limited to: • valves with bellow or double packing seals or equally ~~efficient~~ effective equipment; • magnetically driven or canned pumps/compressors/agitators, or pumps/compressors/agitators using double seals and a liquid barrier; • certified high-quality gaskets (e.g. according to EN 13555) that ~~is~~ are tightened according to technique e.; ~~• corrosion resistant equipment;~~ • closed sampling system. The use of high-integrity equipment is especially relevant to prevent or minimise: • emissions of CMR substances or substances with acute toxicity; and/or • emissions from equipment with high-leaking potential; and/or • leaks from processes operated at high pressures (e.g. between 300 bar and 2 000 bar). High-integrity equipment is selected, installed and maintained according to the type of process and the process operating conditions.	Fugitive emissions	Applicability may be restricted by operational constraints in the case of existing plants. Generally applicable to new plants and major plant upgrades.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 162, 163, 164

4.3.4.1 Use of high-integrity equipment as main technique [DE, supported by EEB]

Split view n. 23 - Split view summary[28]

DE, supported by EEB, proposes to prioritise technique b) 'Use of high-integrity equipment':

- Change wording of the BAT title to: 'In order to prevent or, where that is not practicable, to reduce diffuse VOC emissions to air, BAT is to use technique b) and a combination of the techniques given below with the following order of priority.'

  or:

- Add new BAT 23 a) 'In order to minimise fugitive emissions to air, BAT for new installations and for installations undergoing substantial change is to use high-integrity equipment.'

Summary of the rationale accompanying the split view

- The IED highlights "prevention" in its title ("integrated pollution prevention and control" and, in recital no. 2, stresses prevention priority: "to prevent, reduce and as far as possible eliminate pollution arising from industrial activities in compliance with the 'polluter pays' principle and the principle of pollution prevention". Therefore, BAT conclusions should first require the most effective prevention technique(s).
- The present wording allows the selection of prevention techniques, e.g. selecting only "limiting the number of emission sources". The use of high-integrity equipment should be obligatory. Such equipment is already applied in many installations across Europe and there is a common understanding that it is the most effective technique to prevent fugitive emissions.

Information on which the split view is based

- Comments provided on D1 (DE-A159, DE-A193).
- DE documents: "DE-A159_WGC BREF_D1_proposal for BAT 23_Germany"; "DE-A193_WGC BREF_high integrity equipment_here pipelines and flange connections_DE' (uploaded in BATIS on 12/03/2020).
- DE document 'Proposal on the use of high integrity equipment' (uploaded in BATIS on 24/06/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- BAT 23 prioritises the 'prevention' of diffuse emissions and is therefore in line with the IED. It is also stated that 'BAT is to use a combination of techniques' and therefore it is not clear why for example only technique a. could be selected to prevent diffuse emissions.
- The data collection does not allow a comparison between fugitive emission levels between equipment qualified as 'high-integrity equipment' or not.
- As described by the German document, the concept 'high-integrity equipment' not only includes the choice of equipment depending on the technical constraints (e.g. temperature, pressure, and materials durability), but also the qualified assembly and maintenance of the equipment.

[28] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *DE-Split view BAT 23.docx*.

The German general binding rule ‘TA Luft’ requires equipment to be certified based on national or European standards or industrial guidelines such as the ‘VCI assembly guide’.

- General binding rules of Member States and/or national standards may be a driving force for implementing techniques but are not used as a basis to set BAT.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of DE, supported by EEB, does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the ‘Concluding remarks and recommendations for future work’ chapter of the BREF.

4.3.4.2 Applicability restrictions to the use of high-integrity equipment for existing plants, other than operational constraints [IT]

Split view n. 24 - Split view summary[29]

IT proposes to substitute the phrase 'Applicability may be restricted by operational constraints in the case of existing plants' with 'Applicability may be restricted in the case of existing plants'.

Summary of the rationale accompanying the split view

- Operational constraints are not the only problem that may occur when trying to implement high-integrity equipment in existing plants. In particular, other limitations can arise related to installed process technology and the upgrade required, which may involve significant plant modifications.
- If the overall performance is already proved and monitored (for example by the LDAR) the effort to implement high-integrity equipment in existing plants is unnecessary, and the implementation of high-integrity equipment could be disproportionate to the benefit achieved.

Information on which the split view is based

- WGC data collection (questionnaires of IT plants, e.g. [IT_1], [IT_8], [IT_22], [IT_24], [IT_26], [IT_29], [IT_31], [IT_35].

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The definition of 'operational constraint' as concluded at the Final TWG Meeting includes the functioning of the plant and the expected environmental benefits.
- No additional technical argumentation has been provided to further specify other applicability restrictions for the use of high-integrity equipment for existing plants. The correlation between the information already provided via questionnaire from IT plants and the requested proposal is not clear.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of IT does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

[29] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *Split view IT BAT23 (1).docx*.

4.3.5 BAT conclusions for the use of solvents or the reuse of recovered solvents

4.3.5.1 BAT-AEL for diffuse VOC emissions to air from the use of solvents or the reuse of recovered solvents [EEB]

Conclusion of the Final TWG Meeting

[…]

Table 4.7: BAT-associated emission level (BAT-AEL) for diffuse VOC emissions to air from the use of solvents or the reuse of recovered solvents

Parameter	BAT-AEL (percentage of the solvent inputs) (yearly average) ~~(1)~~ (2)
Diffuse VOC emissions	≤ 5 %
~~(1) The BAT-AEL does not include solvents sold as part of products or mixtures in a sealed container.~~ (2) The BAT-AEL does not apply to plants whose total annual consumption of solvents is lower than 50 tonnes.	

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 171

Split view n. 25 - Split view summary[30]

EEB proposes to lower the BAT-AEL (percentage of the solvent inputs) from '≤ 5 %' down to '≤ 3 %'.

Summary of the rationale accompanying the split view

- The data collection shows that much lower levels of solvent loss are achieved: 17 out 25 installations can reach a level below 3 %, while 12 installations can reach a level below 1 %.
- The level of 5 % is sourced from Council Directive 1999/13/EC of 11 March 1999 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities and installations (now repealed by the IED). The BREFs shall recognise and promote technological progress (and associated enhanced performance of installations), and not align standards with legally binding requirements dating back to 1999.

Information on which the split view is based

- Comments provided on D1 (EEB-129).
- EIPPCB Document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" - Section 3.2.1 (uploaded in BATIS on 14/05/2021).

[30] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_BAT 23_table 4.7_VOC from solvent use.docx*.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- Part 2 of IED Annex VII refers to the activity 'Manufacturing of pharmaceutical products, with a solvent consumption threshold above 50 tonnes/year' and sets a 'Total emission limit value' of '5 % of solvent input' for new installations and of '15 % of solvent input' for existing installations.
- The WGC BREF has a wider scope than IED Annex VII Part 2 and covers all chemicals activities, if not excluded by the scope of the BREF itself.
- The value concluded at the Final TWG Meeting is based on the data collection, including chemical activities other than the manufacturing of pharmaceuticals. A wide range of total emissions (expressed as a percentage of the solvent input) were reported.

  However, the data collection does not include specific contextual information on the use of organic solvents within the different chemical production processes and the associated quantification methods.

Main chemical activity	No. of plants	Range (% of the solvent input)
4.5	13	< 0.1 – 9.1
4.1b	5	0.6 – 18.4
4.1h	4	0.2 – 0.9
4.2e	3	< 0.1 – 1.5
Other	3	0.2 – 7.5

- The TWG decided to include in the 'Concluding Remarks and Recommendations for Future Work' chapter of the BREF a recommendation to collect information on the calculation of the percentage of the solvent inputs.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

5 POLYMERS

5.1 Upper end of the BAT-AEL range for LLDPE [AT]

Conclusion of the Final TWG Meeting

[…]

Table 4.8: BAT-associated emission levels (BAT-AELs) for total emissions to air of ~~VOC~~ VOCs from the production of polyolefins expressed as specific emission loads

Polyolefin product	Unit	BAT-AEL (Yearly average)
HDPE	g ~~VOCs~~ C per kg of polyolefins produced	0.3 – ~~1.8~~1.0 (1)
LDPE		~~0.2 – 1.9~~ 0.1-1.4 (2) (2bis)
LLDPE		~~0.3 – 1.3~~ 0.1- ~~0.7~~ 0.8
~~EVA copolymers~~		~~2.7 – 16~~
PP		~~0.2 – 2~~ 0.1-0.9 (1)
GPPS and HIPS		< ~~0.085~~ 0.1
EPS		< 0.6

(1) The lower end of the BAT-AEL range is typically associated with the gas-phase polymerisation process.
(2) The upper end of the BAT-AEL range may be higher and up to 2.7 g C/kg in the case of the production of ~~LDPE copolymers~~ EVA or other copolymers (e.g. ethyl acrylate copolymers).
(2bis) The upper end of the BAT-AEL range may be higher and up to 4.7 g C/kg if both of the following conditions are met:
- thermal oxidation is not applicable;
- EVA or other copolymers (e.g. ethyl acrylate copolymers) are produced.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 181

Split view n. 26 - Split view summary[31]

AT proposes to reduce the higher end of the BAT-AEL range in Table 4.8 to 0.7 g C/kg.

Summary of the rationale accompanying the split view

- The environmental ambition in the WGC BREF of 2021 should be higher than in the POL BREF from 2007. However, the upper end of the BAT-AEL range in the WGC BREF (0.8 g/kg) is higher than in the POL BREF (0.7 g C/kg for existing plants and 0.5 g C/kg for new plants).
- The BAT-AEL is based on CBI data, which was presented and discussed in a dedicated CBI data workshop. At this particular workshop, two reference plants, representing the higher BAT-AEL of 0.7 g C/kg, were shown. Those plants apply BAT and report data for all emission sources (e.g. storage). For the Final Meeting no data were presented supporting the higher value.

[31] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *AT split view_BAT 25 LLDPE.docx*.

- In the compiled data, no plants/data points have emissions above 0.7 g C/kg. Hence, this change is not supported by data.

Information on which the split view is based

- POL BREF, BAT 6, Table 13.5 (2007).
- Comments provided on D1 (AT-M68, SE-A40, EEB-C109).
- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" (uploaded in BATIS on 14/05/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- AT refers to the EIPPCB document 'Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting' (uploaded in BATIS on 14/05/2021), which referred to averaged (over 3 years) yearly average emission values, which indicates data points up to 0.7 g C/kg.
- In the closed web-based meetings on polymer production processes (9-10 March 2021), all the data including the maximum yearly average values for total emissions to air of VOCs were shown. The value of 0.8 g C/kg for total emissions to air of VOCs for LLDPE took into account the information provided by Plant CBI_909, applying BAT, and reporting a maximum yearly average value above 0.7 g C/kg. However, the data collected on maximum yearly average values were not shown in the Final TWG Meeting.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of AT fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 25/Table 4.8	*To reduce the higher end of the BAT-AEL range for LLDPE.*	*AT*	*0.7 g C/kg*

5.2 Upper end for the BAT-AEL range for LDPE in footnote (2^{bis}) [AT, SE]

Split view n. 27 - Split view summary[32]

AT and SE propose to delete footnote (^{2bis}) in Table 4.8.

Summary of the rationale accompanying the split view

- The exception to raise the upper end three times above the BAT-AEL range for LDPE copolymers is not justified by data. The environmental ambition in the WGC BREF of 2021 should be higher than in the POL BREF from 2007. However, the upper end of the BAT-AEL range in the WGC BREF (4.7 g/kg) is much higher than in the POL BREF (2 g/kg for LDPE copolymers and 3.5 g/kg for LDPE copolymer with high EVA content).
- The BAT-AEL is based on CBI data, which was presented and discussed in a dedicated CBI data workshop. For the Final Meeting no data were presented supporting the footnote.
- Footnote (^{2}) already extends the upper end of the BAT-AEL range for LDPE copolymer production to 2.7 g C/kg. In the compiled data, no plants/data points have emissions between 2.7 g C/kg and 4.7 g C/kg. Hence, this footnote is not supported by data.

Information on which the split view is based

- Comments provided on D1 (AT-M68, SE-A40, EEB-C109).
- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" (uploaded in BATIS on 14/05/2021).
- POL BREF, BAT 6, Table 13.3 (2007).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- No data were reported for the specific case of footnote (^{2bis}). The TWG decision was taken on the basis of expert judgement.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of AT and SE fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 25/Table 4.8	*To delete footnote (^{2bis}) in Table 4.8.*	*AT and SE*	*NA*

[32] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file: *AT_SE split view_BAT 25 footnote 2bis.docx.*

5.3 Minimum monitoring frequency for the vinyl chloride monomer concentration in PVC products [DE, SE]

Conclusion of the Final TWG Meeting

[…]

BAT 27. BAT is to monitor the ~~VCM~~ vinyl chloride monomer concentration in PVC products ~~with~~, at least once every year for each representative PVC grade produced during the same year, ~~the frequency given below and~~ in accordance with EN standards. ~~If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality~~.

Substance	Standard(s)	~~Minimum monitoring frequency~~	Monitoring associated with
~~Vinyl chloride monomer~~ VCM	EN ISO 6401	~~Once every month~~	BAT 30

[…]

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Split view n. 28 - Split view summary[33]

DE and SE propose to change the minimum monitoring frequency from once a year to once a month.

Summary of the rationale accompanying the split view

- The reason for changing the minimum monitoring frequency from once every month to at least once a year was not explained sufficiently.
- VCM is the main diffuse VOC emission from PVC production and is classified as carcinogenic - category 1. Frequent (monthly) monitoring of VCM in the products is therefore important in order to be able to directly react to changing emissions in a timely manner and thus reduce and prevent them.

Information on which the split view is based

- Comment provided on the revised draft BATC (DE-46, SE-28).
- SE proposal on BAT 27 to clarify the change in monitoring frequency for BAT 27 (uploaded in BATIS on 29/05/2021, folder: 14 Final meeting/03 TWG Feedback on BP and revised draft BATC).
- DE proposal to change measurement frequency to "monthly average" for BAT 27 (uploaded in BATIS on 28/05/202, folder: 14 Final meeting/03 TWG Feedback on BP and revised draft BATC).

[33] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *DE-Split view BAT 27.docx; SE split view_BAT 27 monitoring frequency.docx*

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The monitoring requirement in BAT 27 refers to measurements of the VCM concentration for each representative PVC grade produced during the year.
- As explained in the Background Paper for the Final TWG Meeting in the similar case of monitoring frequency for polyolefin grades, operators producing a wide range of polymer grades use statistical models for the calculation of emissions from finishing and storage. These models take into account the measurements of VCM concentration in PVC grades to calculate an average value for a given time period. A minimum monthly monitoring frequency for each representative PVC grade does not seem necessary, as a sample analysis is carried out and if the process operating conditions of the plant do not change. Using these models, VCM emissions could be predicted and competent authorities may react in a timely manner.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of DE and SE does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

5.4 Deletion of footnotes (1) and (2) [EEB]

Conclusion of the Final TWG Meeting

[…]

Table 4.10: BAT-associated emission level (BAT-AEL) for channelled emissions to air of VCM from the recovery of VCM ~~production of PVC~~

Substance	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
~~Vinyl chloride monomer~~ VCM	< 0.5-1 (1) (2)	~~2.5~~
(1) The BAT-AEL does not apply to minor emissions (i.e. when the VCM mass flow is below e.g. ~~2.5~~ 1 g/h). (2) The upper end of the BAT-AEL range may be higher and up to 5 mg/Nm^3 if both of the following conditions are met: • thermal oxidation is not applicable; • the plant is not directly associated to the production of EDC and VCM.		

[…]

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Split view n. 29 - Split view summary[34]

EEB proposes to delete footnotes (1) and (2).

Summary of the rationale accompanying the split view

- Regarding footnote (1), EEB objects to the concept of mass flows, especially for CMR substances. The data collection has shown that many plants below the thresholds comply with the BAT-AEL ranges.
- Regarding footnote (2), EEB objects because the relevance of EDC/VCM plants associated with VCM plants is unclear and it is to be feared that permitting authorities and applicants will consider the condition of bullet one to be fulfilled, especially as the term "excessive energy demand" is not defined in the BREF.

Information on which the split view is based

- Comments provided on D1 (EEB 10, EEB 12).
- Comments provided on the revised draft BATC (EEB 4, EEB 5, EEB 6, EEB 7).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- No technical, cross-media or economic rationales were provided to support the split view.
- Concerning footnote (1), the data collection includes little information on channelled emissions to air of VCM from the recovery of VCM (see split view assessments in Sections 5.5 and 5.6).

[34] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_BAT 29 footnotes VCM.docx.*

According to the data collection, 3 out of these 4 reference plants did not achieve a VCM emission level lower than 1 mg/Nm^3. Only 1 emission point [DE_66] (P1) complies with the BAT-AEL range; see also SVA in Section 5.5.

- The indicative value for minor emissions of VCM takes into account the analysis of the data and information collected (e.g. including site visits in PT), which shows that the share of diffuse VCM emissions is significantly higher than the share of channelled VCM emissions.
- Concerning footnote ([2]), according to the data and information collected, the technique thermal oxidation is implemented, i.e. when a PVC plant is connected on site to a plant for the production of VCM. Reference plants include [BE_55], [ES_46], [FR_24]. In the case of EDC/VCM plants, BAT is to treat waste gases by thermal oxidation (see LVOC BAT 76). According to the data and information collection, PVC reference plants not connected on site to VCM production did not report the use of thermal oxidisers. According to 'VDI 2446', thermal oxidation is used in particular for the reduction of VCM from EDC/VCM production and for low calorific waste gases, and significant amounts of supplementary fuel may be required.
- Regarding the issue 'excessive energy demand', see also the split view assessment in Section 7.2.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

5.5 Upper end of the BAT-AEL range in footnote (2) [CEFIC]

Conclusion of the Final TWG Meeting

[…]

Table 4.10: BAT-associated emission level (BAT-AEL) for channelled emissions to air of VCM from the recovery of VCM ~~production of PVC~~

Substance	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
~~Vinyl chloride monomer~~ VCM	< 0.5-1 (1) (2)	~~2.5~~
(1) The BAT-AEL does not apply to minor emissions (i.e. when the VCM mass flow is below e.g. ~~2.5~~ 1 g/h). (2) The upper end of the BAT-AEL range may be higher and up to 5 mg/Nm^3 if both of the following conditions are met: • thermal oxidation is not applicable; • the plant is not directly associated to the production of EDC and VCM.		

[…]

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Split view n. 30 - Split view summary[35]

CEFIC proposes to increase the upper limit set in footnote (2) from 5 mg/Nm^3 to 10 mg/Nm^3.

Summary of the rationale accompanying the split view

- The graph includes several EPs not representing emissions from the VCM recovery section, i.e. 6 EPs out of 12 EPs represented on the chart are emissions from dryers, namely 5 EPs from UK_19 and 1 EP from NL_39.
- The plants BE_55, ES_46, FR_24 reported no emission data. Waste gases from the VCM recovery are sent to thermal oxidisers.
- The plant DE 66 reported external treatment. Therefore, there are concerns that EP 66 (P1) achieves the reported values only by the combination of condensation and adsorption.
- Excluding Plant DE 66, the best-performing plant would be PT 5 applying cryogenic condensation with an average concentration of 8 mg/Nm^3 and a maximum of 15.7 mg/Nm^3 (emission point PT 5 (P13)).

Information on which the split view is based

- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" (uploaded in BATIS on 14/05/2021).
- File "2019_05_08_WGC_Channelled_Emissions.xlsx" extracted from the data collection (see appendix 1)

[35] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file *Cefic SV BAT 29_final.pdf*.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The EIPPCB document 'Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting' (uploaded in BATIS on 14/05/2021) included EPs associated with the drying steps for PVC production. According to data collected and the general information provided by the European Council of Vinyl Manufacturers (ECVM), emissions from drying are not treated. Moreover, the data collection does not include emission data from PVC plants connected on site to VCM production. Some PVC plants reported that waste gas streams are sent for treatment to a thermal oxidiser, when available, i.e. when a PVC plant is connected on site to a plant for the production of VCM. Reference plants include BE 55, ES 46, FR_24. Therefore, emission points from drying are not taken into account for this split view assessment.
- The data collection includes four EPs which refer to the recovery of VCM applying absorption [UK_19] (CP1), adsorption [NL_36] (C1), condensation [PT_5] (P13) and a combination of condensation and adsorption [DE_66] (P1).
    - According to the data collection, plants using only one technique did not achieve a VCM emission level lower than 1 mg/Nm^3. Reference plant PT_5, applying cryogenic condensation to reduce emissions from the recovery of VCM, reported for the EP '[PT_5] (P13)' an average VCM concentration of 8 mg/Nm^3, a maximum VCM concentration of 15 mg/Nm^3, and an average mass flow of 1.1 g/h.
    - As reported in the flow diagram attached to the questionnaire provided by plant DE_66, the emission value is associated to the combined treatment carried out by condensation and adsorption.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 29/Table 4.10	*To increase the upper end of the BAT-AEL range in footnote ([2]).*	*CEFIC*	*10 mg/Nm^3*

5.6 BAT-AEL range in BAT 29 – Table 4.10 [PT]

Conclusion of the Final TWG Meeting

[…]

Table 4.10: BAT-associated emission level (BAT-AEL) for channelled emissions to air of VCM from the recovery of VCM ~~production of PVC~~

Substance	BAT-AEL (mg/Nm^3) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
~~Vinyl chloride monomer~~ VCM	< 0.5-1 (1) (2)	~~2.5~~

(1) The BAT-AEL does not apply to minor emissions (i.e. when the VCM mass flow is below e.g. ~~2.5~~ 1 g/h).
(2) The upper end of the BAT-AEL range may be higher and up to 5 mg/Nm^3 if both of the following conditions are met:
- thermal oxidation is not applicable;
- the plant is not directly associated to the production of EDC and VCM.

[…]

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Split view n. 31 - Split view summary[36]

PT proposes to exempt stand-alone PVC installations from Table 4.10 and to maintain the applicability of BAT 29 for stand-alone PVC installations, considering the suitable techniques.

Summary of the rationale accompanying the split view

- The treatment of waste gases from VCM recovery by thermal oxidisers in the case of stand-alone PVC plants is not cost-effective, considering economics and cross-media effects.
- The investment cost of a thermal oxidiser burning 2 000-5 000 m^3/h (corresponding to a medium size VCM recovery unit) would be in the range EUR 2–4 million, depending on the specificities of the project.
- Significant amounts of fuel (natural gas) are required to reach and maintain the appropriate temperature (800–1 000 °C) in the thermal oxidiser and significant amounts of CO_2 and NO_X emissions will be released.
- The VCM emissions released from the VCM recovery are low compared with the total VCM emissions of the plant.
- In order to achieve VCM emission levels of ≤ 1 mg/Nm^3 (Table 4.10) for the channelled emissions to air from the recovery of VCM in a PVC installation, a thermal oxidation unit has to be in place.
- The example plant PT_5, applying condensation, cannot always achieve VCM emission levels ≤ 1 mg/Nm^3. As reported by the data collection, the minimum measured VCM concentration is 0.27 mg/Nm^3 and the maximum measured VCM concentration is 15.70 mg/Nm^3 (calculated average concentration is 7.98 mg/Nm^3); and the corresponding the minimum VCM mass flow is 0.037 g/h and the maximum VCM mass flow is 2.48 g/h.

[36] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file *PT Split view on BAT 29 - Table 4.10.pdf.*

Information on which the split view is based

- Site visit in PT (17-20 September 2018).
- Data collection, plant [PT_5].
- Comments provided on D1 (FR-A144, FR-A145, FR-A149, ES-B51, PT-I25, PT-I26, CEFIC-S280, CEFIC-S419).
- Comments provided on the revised draft of BATC (PT-27).
- Document ECVM Memorandum to the WGC BREF Technical Working Group – Spread of vinyl chloride monomer (VCM) air emissions reported by PVC plants, 4 December 2018 (uploaded in BATIS on 04/12/2018, folder: BATIS > Forum > WGC BREF > 10 Workshop on data evaluation > 02 Supporting documents > Spread of vinyl chloride monomer (VCM) air emissions reported by PVC plants).
- PT proposal to delete Table 4.10 (BAT 29) on day 7 (July 2nd, 2021) of the Final TWG Meeting.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The data collection includes emission data from stand-alone PVC plants applying the techniques absorption, adsorption and condensation, including Plant PT 5 applying cryogenic condensation. Regarding the VCM emission levels of stand-alone plants, see also the split view assessment in Section 5.5. Therefore, the rationale provided could support the increase of the upper limit of the BAT-AEL range. However, a general exemption for stand-alone plants from BAT 29 and Table 4.10 does not seem appropriate.
- An applicability restriction for thermal oxidisers was concluded on at the Final TWG Meeting (and for technical rationale see split view assessment in Section 4.2.3).

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of PT does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation for information collection on the assessment of cross-media effects of an integrated waste gas management and treatment strategy and the selection of waste gas treatment techniques (e.g. including the case of stand-alone PVC plant) will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

5.7 Upper end of the BAT-AEL ranges for the VCM concentration in the PVC [EEB]

Conclusion of the Final TWG Meeting

[…]

Table 4.12: BAT-associated emission levels (BAT-AELs) for the VCM concentration in the PVC

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	~~0.001 – 0.3~~ 0.01-0.03
E-PVC		~~0.005 – 0.5~~ 0.2-0.4

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 200

Split view n. 32 - Split view summary[37]

EEB proposes to reduce the upper end of the BAT-AEL for S-PVC below 0.03 g VCM per kg of S-PVC produced, and the upper end of the BAT-AEL for E-PVC below 0.4 g VCM per kg of E-PVC produced.

Summary of the rationale accompanying the split view

- In EEB's initially submitted comments EEB-C113 and EEB-C114 on D1, EEB argued that the residual VCM should be no higher than 0.001 g/kg for both S-PVC and E-PVC, based on voluntary industry commitments.
- EEB later understood that this BAT refers to the stage after vapour stripping of the slurry or latex. This is furthermore in line with the German TA Luft Section 5.4.4.1h.1. The industry commitment, however, refers to the final PVC powder, after drying and mechanical treatment steps.
- The levels agreed in the Final TWG Meeting are substantially lower than the ones proposed in D1; this is an improvement, even though lower levels could be achieved. The anonymised data, however, do not allow it to be ascertained whether the VCM levels (especially broadly distributed in the S-PVC slurry) are due to the physical properties of the polymer grades or to non-optimal stripping. Non-anonymised data and further process information would have allowed the TWG to reach more solid, evidence-based conclusions.
- Note also that up to 29 mg VCM per kg S-PVC and up to 399 mg VCM per kg E-PVC may still be emitted in the open system (while applying BAT), before the final PVC powder reaches market quality, in turn based on the ECVM commitment. The TA Luft, dated 2002, includes two relevant provisions:
  - the operator must keep VCM concentrations at the crucial closed-to-open transition as low as possible,
  - the operator must incinerate the waste air from the drying stage (open system) in the heating of the drying ovens.

[37] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file *EEB split view_BAT 30 upper BAT-AEL VCM.docx*.

Information on which the split view is based

- EEB comments provided on D1 (EEB-C113, EEB-C114).
- Text references in D1 and revised draft BATC (as cited in the above paragraph).
- The German TA Luft regulation.

EIPPCB assessment

The documents and information on which the split view is based were available on time, except for the German TA Luft.

Validity of supporting rationale:

- The proposal of EEB is not clear. No alternative values were proposed for the upper end of the BAT-AEL range for S-PVC and E-PVC.
- No technical, cross-media or economic rationales were provided to support the proposal indicated in the split view.
- The German General binding rule 'TA Luft 2002' includes a constructional and operational requirement that 'dryer waste gas shall be used as combustion air in furnaces if possible'. However, the data and information collection does not include any information on the treatment of dryer waste gases, e.g. by a furnace. General binding rules of Member States and/or national standards may be a driving force for implementing techniques but are not used as a basis to set BAT.
- Concerning the transparency of the data, updated data and information were shown and assessed via a dedicated QLIK Sense application in the closed web-based meetings on polymer production processes (9-10 March 2021). The information included data, such as plant identifier, specific loads, contextual information on the type of plant (stand-alone plant vs plants connected to VCM production), the type of PVC, type of emissions included in the specific loads (e.g. if channelled and/or diffuse), relevant process steps and emission sources, and techniques to recover and reduce emissions to air were presented.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

5.8 Upper end of the BAT-AEL range for E-PVC [CEFIC]

Conclusion of the Final TWG Meeting

[…]

Table 4.11: BAT-associated emission levels (BAT-AELs) for total emissions to air of VCM from the production of PVC expressed as specific emission loads

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	0.01-0.045
E-PVC		~~0.1~~ ~~0.5~~ 0.25 - ~~0.50~~ 0.3 (1)
(1) The upper end of the BAT-AEL range may be higher and up to 0.5 g VCM per kg of PVC produced if both of the following conditions are met: • thermal oxidation is not applicable; • the plant is not directly associated to the production of EDC and VCM		

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 198

Split view n. 33 - Split view summary[38]

CEFIC proposes to increase the upper end of the BAT-AEL range for E- PVC from 0.3 g/kg to 0.4 g/kg.

Summary of the rationale accompanying the split view

- Three reference plants (CBI 481, CBI 186 and CBI 141) reported by the data collection have total emissions in the range between 0.3 g/kg and 0.4 g/kg. Two of these plants indicated that all relevant emission sources were included in the calculation of total emissions, whereas some other reference plants with lower total emissions did not indicate which emission sources were included in the calculation of total emissions.

Information on which the split view is based

- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" (uploaded in BATIS on 14/05/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- As reported by the EIPPCB document 'Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting' – Section 3.3.2.3, page 69 (uploaded in BATIS on 14/05/2021), three plants applying BAT (i.e. stripping) are not in the BAT-AEL range. Two of these plants reported that the relevant emission sources (such as drying and reactor openings) were included in the calculation of the specific loads. Some plants reporting the lowest values for total emissions (CBI 222, CBI 386,

[38] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file *Cefic SV BAT 30_final.pdf*.

CBI 192) did not indicate that these relevant emission sources were included in the calculation of total emissions.

- Plants produce various types of PVC (e.g. suspension PVC and emulsion PVC) and numerous product grades, differing for example in molecular weights, particle structures and thermal sensitivities, and, as a result, the residual VCM concentration after stripping will vary greatly depending on the PVC types and grades.

EIPPCB conclusion

The split view representing the opinion of CEFIC fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 30/Table 4.11	*To increase the upper end of the BAT-AEL range for E-PVC.*	*CEFIC*	*0.4 g VCM/kg of PVC produced*

5.9 Deletion of Table 4.8, Table 4.11, Table 4.12 and Table 4.13 [DE]

Conclusion of the Final TWG Meeting

[…]

Table 4.8: BAT-associated emission levels (BAT-AELs) for total emissions to air of ~~VOC~~ VOCs from the production of polyolefins expressed as specific emission loads

Polyolefin product	Unit	BAT-AEL (Yearly average)
HDPE	g ~~VOCs~~ C per kg of polyolefins produced	0.3 – ~~1.8~~1.0 (1)
LDPE		~~0.2 – 1.9~~ 0.1-1.4 (2) (2bis)
LLDPE		~~0.3 – 1.3~~ 0.1- ~~0.7~~ 0.8
~~EVA copolymers~~		~~2.7 – 16~~
PP		~~0.2 – 2~~ 0.1-0.9 (1)
GPPS and HIPS		< ~~0.085~~ 0.1
EPS		< 0.6

(1) The lower end of the BAT-AEL range is typically associated with the gas-phase polymerisation process.
(2) The upper end of the BAT-AEL range may be higher and up to 2.7 g C/kg in the case of the production of ~~LDPE copolymers~~ EVA or other copolymers (e.g. ethyl acrylate copolymers).
(2bis) The upper end of the BAT-AEL range may be higher and up to 4.7 g C/kg if both of the following conditions are met:
- thermal oxidation is not applicable;
- EVA or other copolymers (e.g. ethyl acrylate copolymers) are produced.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 181

[…]

Table 4.11: BAT-associated emission levels (BAT-AELs) for total emissions to air of VCM from the production of PVC expressed as specific emission loads

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	0.01-0.045
E-PVC		~~0.1 – 0.5~~ 0.25 - ~~0.50~~ 0.3 (1)

(1) The upper end of the BAT-AEL range may be higher and up to 0.5 g VCM per kg of PVC produced if both of the following conditions are met:
- thermal oxidation is not applicable;
- the plant is not directly associated to the production of EDC and VCM

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 181

[…]

Table 4.12: BAT-associated emission levels (BAT-AELs) for the VCM concentration in the PVC

PVC type	Unit	BAT-AEL (Yearly average)
S-PVC	g VCM per kg of PVC produced	~~0.001 – 0.3~~ 0.01-0.03
E-PVC		~~0.005 – 0.5~~ 0.2-0.4

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 198, 200

[…]

Table 4.13: BAT-associated emission level~~s~~ (BAT-AEL~~s~~) for total emissions to air of VOCs ~~and 1,3-Butadiene~~ from the production of synthetic ~~solution-polymerised~~ rubbers expressed as specific emission load

Substance/Parameter	Unit	BAT-AEL (Yearly average)
TVOC~~s~~	g C~~VOCs~~ per kg of ~~polymerised~~ synthetic rubber produced	0.2 – ~~11~~ ~~2.3~~ 4.2
~~1,3-Butadiene~~		~~< 0.007~~

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide number: 205

Split view n. 34 - Split view summary[39]

DE proposes the following:

- to delete Table 4.8, or not to address copolymers other than EVA copolymers;
- to delete Table 4.11, Table 12 and Table 4.13.

Summary of the rationale accompanying the split view

- Measurement or specific calculation methods to determine emission values in the polymer sector were not agreed on before the data collection, which causes a diversity of approaches and different determination methods at each source are described in detail (e.g. conventional stack measurements, diffuse emission measurement methods, calculations based on emission factors from literature, etc.). However, for an evaluation of the data and the possible derivation of BAT-AELs, it is crucial to know exactly how the data were obtained.
- As no agreement on these diverse potential approaches exists, the results are not comparable. For the same process, data will vary significantly, depending mainly on the performance of the plant but also on the applied scope, measurement methods and literature used for emission factors.

[39] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *DE-Split view BAT 25 table 4.8.docx; DE-Split view BAT 30 tables 4.11 and 4.12.docx; DE-Split view BAT 32 table 4.13.docx*.

- Furthermore, the presented data included channelled, diffuse or fugitive emissions or a mixture of those. The influence of the inclusion or exclusion of certain emissions on the data reported is also assumed to be significant. These reasons lead to a lack of transparency in the data.
- Techniques or products associated with low emissions and therefore with BAT are not described. Due to these reasons, it is impossible to derive meaningful and fact-based BAT-AELs.
- In order to achieve the main goal of the IED to harmonise permitting in the European Union, it is necessary to define consistent and comparable monitoring methods.
- The data collection includes only data for EVA copolymers, therefore the BAT-AEL can only apply for those copolymers and the footnotes ([2, 2bis]) should reflect that.

Information on which the split view is based

- Comments provided on the revised draft BATC (DE-44, DE-45, DE-49, DE A-69).
- Comments voiced during the closed sessions on polymer production processes (9-10 March 2021).
- 'Common position – Transparency of the data for deriving BAT-AELs' (uploaded in BATIS on 3/11/2020).
- DE position on polymers in the WGC BREF.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- BAT-AELs expressed as specific loads (g VOCs per tonne of product) for different types of polyolefins were concluded on in the POL BREF and implemented in permits [e.g. BE 41].
- BAT-AELs expressed as specific loads (g VCM per tonne of product) were concluded for the PVC types suspension PVC and emulsion PVC in the POL BREF and implemented in permits [e.g. PT 5].
- The final version of questionnaire requested data on channelled and diffuse emissions, and on total emissions of VOCs and VCM expressed as specific loads, but did not request detailed information on the calculation of total emissions of VOCs or VCM. However, the TWG agreed on this questionnaire after three iterative commenting rounds.
- Approaches to calculate and monitor total emissions of VOCs or VCM were provided as part of the bulk information (e.g. VDI 2446, PVC – Methodology to measure VCM emissions) and by site visits (see site visits in BE/NL/DE and the site visit in BE, carried out mainly focusing on the techniques to reduce emissions to air of organic compounds).
- Concerning the quality of the data, Member States were asked to check and supplement data provided on specific loads (collected as CBI), with relevant contextual information if necessary. In order to ensure the quality and comparability of the data, the EIPPCB provided a guidance document for assisting the quality check.
- Concerning the transparency of the data, updated data and information were shown and assessed via a dedicated QLIK Sense application in the closed web-based meetings on polymer production processes (9-10 March 2021). Data and information such as plant identifier, specific loads, contextual information on the type of polyolefin, the type of PVC, the type of plant (stand-alone plant vs plants connected to VCM production), type of emissions included in the specific loads (e.g. if channelled and/or diffuse), relevant process steps and emission sources, and techniques to recover and reduce emissions to air (e.g. thermal oxidation) were presented.

- Concerning the comparability of monitoring methods, the BAT on the monitoring of channelled and diffuse emissions also apply to the production of polymers and support the calculation of total emissions. The notes below Table 4.8, Table 4.11 and Table 4.13 describe the relevant emission sources and associated monitoring. In addition:
    - BAT 24 describes the monitoring of volatile organic compounds in polyolefin grades;
    - BAT 26 describes the monitoring of channelled emissions of VCM and BAT 27 describes the monitoring of the VCM concentration in PVC grades;
    - BAT 31 describes the monitoring of channelled emissions of volatile organic compounds in synthetic rubber grades.
- Concerning the use of copolymers, the data collection included plants reporting the use of ethylene vinyl acetate (EVA) and of ethylene ethyl acrylate (EEA) and derivatives of EEA. Due to the physical chemical properties of the copolymers, the use of these copolymers leads to higher specific loads.
- As reported by the information collection and confirmed during the site visits, the total emission levels mainly depend on the residual VCM content in the slurry/latex after applying stripping and the residual VCM is released during the drying step of PVC production. Plants produce various types of PVC (e.g. suspension PVC and emulsion PVC) and numerous product grades, differing for example in molecular weights, particle structures and thermal sensitivities, and, as a result, the residual VCM concentration after stripping (see BAT 30, technique d.) will vary greatly depending on the PVC types and grades.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of DE do not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

6 PROCESS FURNACES/HEATERS

Conclusion of the Final TWG Meeting

[…]

Table 4.17: BAT-associated emission level (BAT-AEL) for channelled NO_X emissions to air and indicative emission level for channelled CO emissions to air from process furnaces/heaters

Parameter	BAT-AEL (mg/Nm³) (Daily average or average over the sampling period)	~~Mass flow threshold (g/h)~~
Nitrogen oxides (NO_X)	~~10~~ ~~50~~ 30 - 150 (1) ~~(2)~~ (3) ~~(4)~~ (xx)	~~1 000~~
Carbon monoxide (CO)	No BAT-AEL (5)	

(1) In the case of the production of complex inorganic pigments, ~~T~~the ~~upper end of the~~ upper end of the BAT-AEL range ~~range may be up to 400 mg/Nm³ may not apply~~ may be higher and up to 400 mg/Nm³ ~~to the production of inorganic pigments~~ when condition b) below is met, and up to 1 000 mg/Nm³ when conditions b) and c) below are met:
~~a) direct heating is used and~~
b) ~~if~~ the combustion temperature is higher than 1 000 ~~1 200~~ °C;~~.~~
c) oxygen-enriched air or pure oxygen is used.

~~(2) When the waste gases of two or more process furnaces/heaters are discharged through a common stack, the BAT-AEL applies to the combined discharge from the stack.~~

(3) The BAT-AEL does not apply to minor emissions (i.e. when the NO_X mass flow is below e.g. ~~1 000~~ 5 00 g/h).

~~(4) The BAT-AEL may not apply to the production of catalysts using metal nitrates when direct heating is used.~~

(xx) The upper end of the BAT-AEL range may be higher and up to 200 mg/Nm³ when direct heating is used.

(5) As an indication, the emission levels for carbon monoxide are 4-50 mg/Nm³, as a daily average or average over the sampling period.

[…]

Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 223, 224

6.1 Deletion of footnote (3) [AT, BE, DE, SE, EEB]

Split view n. 35 - Split view summary[40]

AT, BE, DE, SE and EEB propose to delete footnote (3) in Table 4.17.

Summary of the rationale accompanying the split view

- A mass flow threshold is not necessary in this case. The aim of a mass flow threshold is to exempt minor sources, but minor sources are already excluded from the scope via the exclusion of process furnaces/heaters with a total rated thermal input below 1 MW.
- Even with lowering the mass flow threshold from 1 000 g/h to 500 g/h, many data points are below the threshold, especially when looking at process furnaces/heaters within the scope (thus > 1 MW), at the same time as most of them are within the proposed BAT-AEL range.
- If process furnaces/heaters are used, they need to be operated so as to ensure optimal availability, effectiveness and efficiency of the equipment (see BAT 6), hence emission reduction to emission values associated with BAT needs to be achieved.

[40] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file *BAT 36_split view on MFT for NOX for process furnaces and heaters_final.docx.*

- See also the MCPD and LCP BATC: emission limits are established for all combustion units without exemptions.
- NO_X emissions of process furnaces/heaters can technically be minimised. Introducing a mass flow threshold would result in a not well-performing plant. This is not in line with the IED and BAT concept.

Information on which the split view is based

- Comments provided on D1 (AT 13, AT 14, AT 89, BE 143, DE 182).
- Comments provided on the revised draft BATC (AT 47, DE 64, SE 31).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The data collection does support distinguishing between minor and major contributors to channelled NO_X emissions, independently from the source of emissions.
- Combustion plants such as process furnaces/heaters considered as an integral part of reactors and used in the chemical industry are excluded from the scope of the MCPD and the LCP BREF.
- Process furnaces/heaters with a total rated thermal input less than 1 MW are not generally excluded from the WGC BATC according to the conclusion in Section 4.3, which reads as follows:
    - Where the waste gases of two or more separate process furnaces/heaters are, or could, in the judgement of the competent authority, be discharged through a common stack, the capacities of all individual furnaces/heaters shall be added together for the purpose of calculating the total rated thermal input.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of AT, BE, DE, SE and EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

6.2 Deletion of footnote ([xx]) [AT, DE]

Split view n. 36 - Split view summary[41]

AT and DE propose to delete footnote ([xx]) in Table 4.17.

Summary of the rationale accompanying the split view

- During the Final TWG Meeting, the reference oxygen content of 3 % was introduced initially for all process furnaces and heaters.
  According to the equation for calculating the emission concentration at the reference oxygen level given in the General considerations, the corrected emissions from direct heaters, which typically have higher real oxygen contents, are higher compared to the emission values without O_2 correction.
  Hence, the footnote when direct heating is used was added based on EPs recalculated to 3 % oxygen reference.
  During the discussions, general consensus was reached that the reference oxygen content of 3 % should only apply for indirect heating because these waste gases consist of waste gas from combustion and varying waste gas amounts from processes. However, the footnote needed for the recalculated higher emission values for direct heaters was not withdrawn.
  Therefore, data on direct heating need to be analysed with the specific process oxygen levels without correction. Data show that there is no need to add a specific footnote for direct heating as the upper end of the BAT-AEL range of 150 mg/Nm^3 is generally achieved.

Information on which the split view is based

- Comment provided on D1 (DE-A70).
- Comment provided on the revised draft of the BATC (DE-8).
- EIPPCB document "Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting" - Section 3.4.1.3: "Channelled emissions to air of NO_x, direct heating and dual use heating", graph on page 75 (uploaded in BATIS on 14/05/2021).

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- It should be noted that the EIPPCB document 'Compilation of graphs and data tables related to BAT-AELs proposed in the revised draft BAT conclusions for the final TWG meeting' (uploaded in BATIS on 14/05/2021) refers only to EPs with a mass flow equal to or higher than 1 000 g/h (as indicated by the data filter). However, all data points were shown in the final TWG meeting by the using the WGC QLIK Sense application.
- There is evidence in the data collection supporting higher NO_X emission levels for chemical processes using furnaces with direct heating other than the case of the production of complex inorganic pigments addressed by footnote ([1]). At least three EPs applying primary techniques to reduce channelled emissions of NO_X reported an average concentration higher than 150 mg/Nm^3 and lower than 200 mg/Nm^3.

[41] Full version available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see file *Split view on BAT 36 tab 4.17 Footnote xx by AT and DE.docx.*

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of AT and DE fulfils the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 36/Table 4.17	*To delete footnote (xx)*	*AT and DE*	*NA*

7 SPLIT VIEWS RELATED TO SEVERAL ITEMS

7.1 Dedicated provisions for batch processes [CEFIC, supported by CZ]

Split view n. 37 - Split view summary[42]

CEFIC, supported by CZ, proposes to introduce specific longer-term mass flow thresholds for batch processes (e.g. based on the actual operating hours) and BAT-AELs based on longer-term averaging periods accordingly.

Summary of the rationale accompanying the split view

- Selection of text and figures from the ROM, paragraph 3.5 (pages 31 and 32).
- CEFIC fully acknowledges that the data collection provides only little insight into the specificities of batch processes. This is not surprising since only 65 out of over 2 000 data sets for batch processes reported continuous monitoring.
- Annual operating hours was not a mandatory field in the questionnaires and so was only provided for a minority of installations, which resulted in a lack of information concerning total annual mass releases. That information is crucial to determine minor and major emissions and to prevent disproportionate requirements being placed on emission sources that are very small by comparison. Further, many batch processes are small scale and are operated by small-medium enterprises, which do not generally have sufficient resources to provide information to the Sevilla Process.

Information on which the split view is based

- CEFIC's various papers on batch processes (uploaded in BATIS on 29/06/2020, 30/01/2021, 28/05/2021).
- ROM.

EIPPCB assessment

The documents and information on which the split view is based were available on time.

Validity of supporting rationale:

- The arguments provided are rather general and lean on common 'knowledge' as reported by the ROM.
- BAT-AEL ranges proposed, discussed and concluded within the drawing up/revision of BREFs are based on the comparative analysis of data collected from the real operating plants, and not on the description of hypothetical implementation situations.
- The data collection shows numerous plants referring to batch processes. However, no technical rationale, based on reference plants, was provided to justify the need to have specific long-term mass flow averages (e.g. on a yearly basis) for batch processes.
- Footnote ([1]) in the section 'General considerations - Emission levels associated with the best available techniques (BAT-AELs) and indicative emissions levels for channelled emissions to air', as amended and agreed on at the Final TWG Meeting, addresses the issue of discontinuous

[42] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'Cefic Split View General on Batch Processes', see file *Cefic SV Batch final.pdf.*

processes, such as the batch processes. Longer averaging periods to achieve a more representative sampling/measurement in the case of batch processes may be considered by the competent authorities, as a matter of implementation.

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of CEFIC, supported by CZ, does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

However, a recommendation to collect data and information on the actual/real operating hours of the processes (including the abatement techniques) for the purpose of calculating the yearly mass flow (e.g. for batch processes) will be reported in the same chapter of the BREF.

7.2 Meaning of 'excessive energy demand' and 'low concentration' in the applicability [EEB]

Conclusion of the Final TWG Meeting

• BAT 9 • BAT 11 • BAT 13 • BAT 15 • BAT 18 • BAT 34 (technique a, applicability restriction)
Consolidated 'WGC Final Meeting conclusions' - Slide numbers: 85, 89, 90, 104, 113, 126, 212

Split view n. 38 - Split view summary[43]

EEB proposes to define what is meant by 'excessive energy demand' and 'low concentration' in BAT 9, BAT 11, BAT 13, BAT 15, BAT 18 and BAT 34 (technique a, applicability restriction).

Summary of the rationale accompanying the split view

- When the BAT are accompanied by applicability restrictions, these restrictions shall not be worded in an ambiguous way, as this: a) undermines the goal of harmonisation across Member States; and b) allows for the dismissal of effective techniques (especially when these techniques are not favoured by the industry due to economic considerations), such as in the case of thermal oxidation for the abatement of organic compounds.

Information on which the split view is based

- Comment provided on D1 (EEB #112).
- Comment provided on the revised draft of the BATC (EEB #5).

EIPPCB assessment

The information on which the split view is based was available on time.

Validity of supporting rationale:

- No technical, cross-media or economic data or information were provided to support the request indicated in the split view. Moreover, no concrete proposal is therein included.
- A similar wording (i.e. 'energy demand is excessive' and 'low concentration') associated with the applicability of techniques to reduce emissions to air was agreed on in recently adopted BATC (e.g. STS, LVOC).

EIPPCB conclusion

Taking these aspects into account, the EIPPCB considers that the split view representing the opinion of EEB does not fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU. This split view will therefore not be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

[43] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; post 'EEB split views', see file: *EEB split view_excessive_low_wording.docx.*

However, a recommendation for information collection on energy demand associated with the use of the techniques listed in BAT 9, BAT 11, BAT 13, BAT 15, BAT 18 and BAT 34, and the minimum concentration of the compounds in the process off-gases sent for recovery or abatement will be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

7.3 Deletion of ‘e.g.’ before the values of the mass flows in footnotes [DE, DK, SE, EEB]

Conclusion of the Final TWG Meeting

• BAT 11, Table 4.1, Footnote ([3]), Footnote ([4 bis]), Footnote ([5 bis]), Footnote ([8]), Footnote ([9]) • BAT 14, Table 4.3, Footnote ([2]), Footnote ([xx]), Footnote ([7]), Footnote ([xy]) • BAT 18, Table 4.6, Footnote ([6]), Footnote ([7]), Footnote ([8]), Footnote ([9]) • BAT 29, Table 4.10, Footnote ([1]) • BAT 36, Table 4.17, Footnote ([3])
Consolidated ‘WGC Final Meeting conclusions' - Slide numbers: 92 to 97, 108 to 110, 128 to 131, 193, 223 to 224

Split view n. 39 - Split view summary[44]

Summary of DE split view
DE proposes to delete ‘e.g.’ in all footnotes to prevent the possibility to implement higher thresholds and to achieve a harmonised implementation in the European Union by defining a clear limit as the mass flow threshold.

Summary of DK, SE and EEB split views
DK, SE and EEB proposes to delete the ‘e.g.’ before the values of the mass flow thresholds in the footnotes in BAT 11 (Table 4.1), BAT 14 (Table 4.3), BAT 18 (Table 4.6) and BAT 36 (Table 4.17), or to change the wording as follows:

- “*The BAT-AEL does not apply to minor emission sources**.** The mass flow of a minor source is never higher than xxx g/h.”*, or
- “*The BAT-AEL may not apply to minor emissions (i.e. the mass flow must be lower than xx g/h).*

Summary of the rationale accompanying the DE split view

- IED stresses in recital no. 2 that “it is necessary to establish a general framework for the control of the main industrial activities”.
- IED aims in recital no. 3 at “a level playing field in the Union by aligning environmental performance requirements for industrial installations”.
- According to Article 15(3) of the IED, it needs to be ensured that emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.
- The wording of the above-mentioned footnotes leaves the decision to the competent authority how to define a minor emission by not setting a clear limit value.
- It should be stated that the mass flow must be lower than the value mentioned in the respective footnote.
- The missing upper limit of the mass flow threshold contradicts the aim of the IED as it will lead to a non-harmonised implementation of environmental performance requirements in the European Union. This will create an unintended loophole within the permitting under the IED. In the light of current Commission initiatives, e.g. under the Zero Pollution Ambition action plan, this will also mean giving up on achievements of the past instead of progress.

[44] Full versions available in BATIS, folder: BATIS>Forum>Common Waste Gas Treatment in the Chemical Sector>14 Final Meeting>06 Split views; see files: *DE-Split view on the wording of footnotes for MFT e.g..docx; Split view e.g. before MFT in footnotes - by DK.docx; SE split view on wording of footnote for MFT (e.g).docx; EEB split view_tables 4.1, 4.3, 4.6_eg wording.docx.*

Summary of the rationale accompanying the DK, SE and EEB split views

- The wording of the footnote is too weak. The 'e.g.' opens up for a less strict interpretation of the mass flow threshold and allows emissions higher than xx g/h to be considered as "minor emissions". Thus, the wording may lead to weakened environmental considerations, which is not in line with the ambition of the EU Green Deal and the Zero Pollution Action Plan.
- The wording does not support a level playing field in the EU. It will inevitably lead to diverging implementation in different Member States, thus jeopardising the level playing field.
- The wording may lead to disagreement between the competent authority and the installation in the way it should be interpreted, which may lead to lengthy and costly appeals.

Information supporting the DE split view

- Comments provided on D1 (see, for example, DE-A130, DE-A131, DE-A133, DE-A138, DE-A152, DE-A154).
- DE presentation "Mass Flow (MF) Thresholds Considerations from DE point of view" for the 2nd Data Assessment Workshop (1-2 December 2020) (uploaded on BATIS on 30/11/2020).
- Common proposal: mass flow thresholds on WGC plant level revised version (uploaded in BATIS on 04/03/2021, folder: *11 Draft 1/Complementary information and proposal*).

Information supporting the DK split view

- *No information provided (DK referred to the file 'Compiled DRAFT conclusions', slide 99, DISSENTING VIEWS (Table 4.1 (8/8)).*

Information supporting the SE split view

- SE input on mass flow thresholds (uploaded in BATIS on 29/01/2021, folder: *11 Draft 1/Complementary information and proposal).*
- AT proposal for setting thresholds (uploaded in BATIS on 01/02/2021, folder: *11 Draft 1/Complementary information and proposal*).
- NL – MFT further analysis required (uploaded in BATIS on 05/02/2021, folder: *11 Draft 1/Complementary information and proposal*).
- Common proposal: mass flow thresholds on WGC plant level revised version (uploaded in BATIS on 04/03/2021, folder: *11 Draft 1/Complementary information and proposal*).
- Agenda proposal on mass flow threshold and way forward, uploaded in BATIS on 28/05/2021, folder: *14 Final meeting/03 TWG Feedback on BP and revised draft BATC*.
- Agenda proposal from BE mass flow threshold, uploaded in BATIS on 28/05/2021, folder: *14 Final meeting/03 TWG Feedback on BP and revised draft BATC.*

Information supporting the EEB split view

- Comments provided on D1 (e.g. EEB#115).
- 'EEB position paper on mass flow thresholds' (uploaded in BATIS on 24/03/2021).
- Agenda proposal on mass flow threshold and way forward (uploaded in BATIS on 28/05/2021, folder: *14 Final meeting/03 TWG Feedback on BP and revised draft BATC*).
- Agenda proposal from BE mass flow threshold (uploaded in BATIS on 28/05/2021, folder: *14 Final meeting/03 TWG Feedback on BP and revised draft BATC*).

- EEB support for the above proposals (in the message accompanying the EEB comments provided on the revised draft BATC (uploaded in BATIS on 01/06/2021, folder: *14 Final meeting/03 TWG Feedback on BP and revised draft BATC*).

EIPPCB assessment of DE, DK, SE, EEB split views

The documents and information on which the DE, SE and EEB split views are based were available on time. No document or information were provided by DK to accompany the rationale of the split view submitted.

Validity of supporting rationale:

- The data collection could support identifying distinct mass flow values for minor contributors to channelled emissions, taking into account: quantity of emissions (channelled, diffuse, total) reported by the chemical sectors, permit data on the use of mass flows, hazard properties of the pollutants. However, at the Final TWG Meeting there was no convergence of views among participants on the identification of specific values.

EIPPCB conclusion

The split views representing the opinion of DE, SE and EEB fulfil the conditions set out in Section 4.6.2.3.2 of Commission Implementing Decision 2012/119/EU, while the split view representing the opinion of DK only partially fulfils such conditions. This split view will therefore be reported in the 'Concluding remarks and recommendations for future work' chapter of the BREF.

A possible formulation of this split view could be:

BAT conclusion	Dissenting view	Expressed by	Alternative proposed level (if any)
BAT 11/Table 4.1 *BAT 14/ Table 4.3* *BAT 18/ Table 4.6* *BAT 29/Table 4.10* *BAT 36/Table 4.17*	*To delete 'e.g.' in all footnotes where a mass flow value is indicated.*	*DE, DK, SE and EEB*	*NA*