



EUROPEAN COMMISSION
DG JOINT RESEARCH CENTRE
Directorate B – Growth and Innovation
Circular Economy and Industrial Leadership
European IPPC Bureau

WGC BREF Questionnaire

User's Manual

**How to fill in the questionnaire for the data collection for the drawing up of the
Common Waste Gas Treatment in the Chemical Sector (WGC) BREF**

Contents

1	PURPOSE	3
2	GENERAL INSTRUCTIONS.....	4
2.1	HOW TO FILL IN THE QUESTIONNAIRE.....	4
2.2	AFTER FILLING IN THE QUESTIONNAIRE	6
3	STRUCTURE AND CONTENT OF THE QUESTIONNAIRE	8
3.1	INTRODUCTORY NOTES	10
3.2	INSTALLATION IDENTIFICATION AND DESCRIPTION	10
3.3	CHANNELLED EMISSIONS TO AIR	11
3.3.1	Monitoring information and measurement results.....	14
3.3.2	Additional information on abatement or recovery techniques.....	16
3.3.3	Information on waste gas properties when no treatment technique is applied ..	18
3.3.4	Complementary worksheets	19
3.4	DIFFUSE EMISSIONS TO AIR	20
3.4.1	Fugitive/non-fugitive emissions to air	21
3.4.2	Mass balance exercise - Solvent management plan (SMP)	22
3.5	ENDNOTES.....	22
4	ANNEX: SCOPE OF THE DATA COLLECTION.....	23
5	GLOSSARY	25

1 PURPOSE

In the framework of implementation of Directive 2010/75/EU on industrial emissions (IED), the purpose of the questionnaire is to collect **data and contextual information** to derive the Best Available Technique (BAT) conclusions for common waste gas treatment in the chemical sector. This questionnaire focuses on the levels of emissions to air with a view to deriving BAT-associated emission levels (BAT-AELs) for emissions to air. Contextual information on how the data are obtained is imperative for deriving meaningful conclusions.

The filled-in questionnaires are one of the main sources of information on WGC plants for drawing up the WGC BREF. Several members of the technical working group (TWG), representing Member States, industry groups, an environmental non-governmental organisation and the European Commission, have been active in developing the questionnaire and this User's Manual. Your plant is invited to participate and fill in a questionnaire that will lead to the update of the European emission standards for chemical installations.

Member States' representatives are responsible for checking the quality, completeness and consistency of the data in the completed questionnaires, so you should send your completed questionnaire to your Member State representative.

BREF information and BAT-AEPLs are not only used in the EU but worldwide and are highly regarded. The European IPPC Bureau (EIPPCB) and the TWG are grateful for your cooperation in this extensive exercise.

NB: The definitions of terms in this document are not legal definitions (although some of them may coincide with the definitions given in European legislation); they are meant to help the reader understand some key elements in the context of their use in the questionnaire.

2 GENERAL INSTRUCTIONS

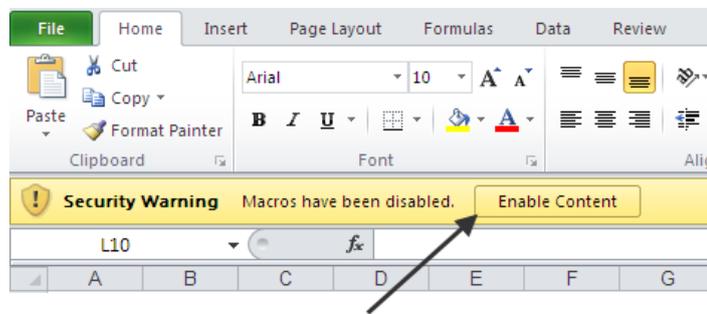
2.1 How to fill in the questionnaire

Macro settings

Please note that all worksheets in the questionnaire are protected to prevent accidental addition or deletion of information and in order to facilitate the automated extraction of the data. Many cells are preformatted and will allow the user to enter only one given type of data (e.g. text, number or year). For some other cells, the value will need to be chosen from a list of predefined choices by using a drop-down menu.

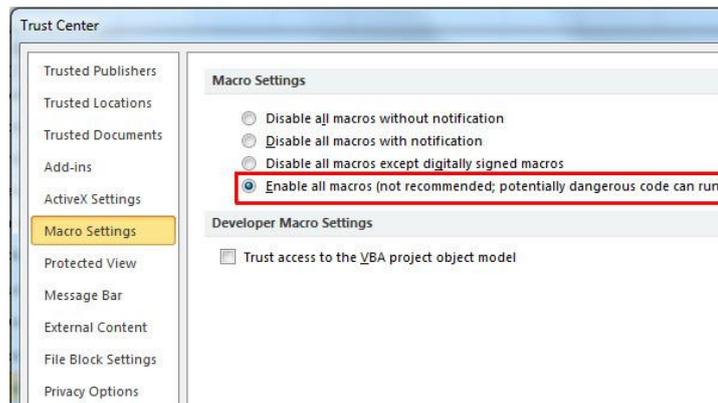
Please do not make any modification to the workbook and the worksheets manually (e.g. do not modify sheets' titles, hide or unhide sheets or lines, merge, unmerge or move cells, change the content of the drop-down menus) as this will hinder the electronic processing of the data and prevent other automated functionalities from working correctly.

The questionnaire was designed using Microsoft Excel 2010. When opening the questionnaire (Excel file) a security warning may appear asking you to enable macros. Please click on 'Enable Content'.



Note: Macros can also be enabled from the 'Trust Center':

Tab 'File' > Options > Trust center > Trust center settings > Macro Settings



The *Macros Settings* from the *Trust Center* in *Excel Options* must be set to 'Enable all macros' for the questionnaire to function correctly.

Colour code

There are three types of cells in this questionnaire:

Yellow cells	These cells are the background of the questionnaire containing all the questions and headings. These cells must not be modified.
White cells	Cells to be filled in with the data or information requested. The data or information reported in these cells will be posted onto BATIS and shared between TWG members.
Red cells	Cells to be filled in with the data or information requested. The data or information reported in these cells will be handled as Confidential Business Information (CBI). The data or information will not be posted onto BATIS and it will not be shared between TWG members. (See section below: 'Confidential Business Information')

Hyperlinks

[Hyperlinks](#): several cells contain a hyperlink to sheet '5. Endnotes'. Click on the hyperlink for further descriptions or guidance on how to complete the questionnaire. Hyperlinked text is coloured blue and underlined.

Filling in the questionnaire

Several cells propose predefined choices via a **drop-down menu selection**. Drop-down menus are indicated by the symbol ▼. When the cell containing a drop-down menu is selected, a grey square □ will appear on the right-hand side of the cell. Click on this grey square to display the list of predefined choices.



Some requested data or information may not always be available or relevant. In this case, leave the cell empty and indicate the reason in the 'Comments' cell if necessary. If some data are available but cannot be reported in the format requested by the questionnaire, the corresponding cell should be marked 'NA' and you should report the data in the 'Additional information' or 'Comments' cell.

Generally, each sheet contains dedicated cells for providing additional information or comments, where all the complementary information regarding the filled-in data can be presented. The length of a text comment is limited to 500 characters. Furthermore, if some supporting documents (e.g. diagrams, graphs) are provided with the questionnaire (e.g. as attachments), this should be mentioned in the corresponding 'Comments' cell, with the name of the document or file name. You are kindly asked to provide a list of all the files attached to, or returned with, the filled-in questionnaire in the Block 'Attachments' of the worksheet '2. Installation'.

How to report figures and numbers, decimal points and digit grouping

Please make sure that the proper punctuation is used with decimal numbers. This punctuation should follow the standard Excel format in your country (e.g. 5.3 in Spain/UK or 5,3 in Austria/Germany).

Do not use punctuation to indicate thousands, millions, etc. (e.g. insert the number twelve thousand as 12000, not 12.000 nor 12,000, to avoid misinterpretations).

Printing the questionnaire

The whole questionnaire can be printed, following the instructions below. These may change depending on the language and version of Excel.

To print one sheet: select the relevant sheet by clicking on the corresponding tab (name), and then go to Excel menu 'File' > 'Print', and in settings choose 'Active sheets'.

To print the whole questionnaire: go to Excel menu 'File' > 'Print', and in settings choose 'Entire workbook'. However, as some sheets are large, it is recommended to select the printing options accordingly (e.g. paper size A4/A3, orientation, scale), to obtain readable printouts. These may differ from sheet to sheet and depending on your printer configuration.

2.2 After filling in the questionnaire

Submitting the final data and verification process

The filled-in questionnaires should be provided in the same format as the one provided by the EIPPCB (e.g. Excel file '.xlsm'). Any file other than the original Excel workbook provided by the EIPPCB might present compatibility issues with our data extraction tool. Should this be the case, the information provided might not be taken into consideration for the data collection and the derivation of BAT and BAT-AE(P)Ls.

Please save the questionnaire using the auto-naming functionality of the questionnaire (see Section 3.2). The filled-in questionnaires should be returned to the relevant contact in your Member State (the person who sent you the questionnaire).

Confidential Business Information (CBI)

The exchange of information under the IED should not lead to the breaching of either EU or national competition laws or other laws designed to protect legitimate economic interests. The information submitted by filling in this questionnaire will be used solely for the purpose of the drawing up of the WGC BREF. This questionnaire has been designed to focus on emission data that, in principle, should not be confidential.

The TWG has decided that they will need to collect some contextual information on waste gas treatment techniques and specific processes/products. A small proportion of this information will be treated as CBI and will be reported in the red cells:

Worksheet number	Worksheet name	Type of information regarded as CBI
3.2	Waste gas treatment technique	Operational information on the consumables used, e.g. steam or cooling water. Operational information on the turnaround interval and the date of the last turnaround.
3.3	Process furnace/heater	Process temperature
3.3	Particular polymer production	Information on monomer concentration in the product expressed as specific loads. Information on emissions to air expressed as specific loads. (Note: The emissions to air expressed as concentrations will be reported in worksheet 3.1 and will not be CBI).

The operator will:

- send the full questionnaire (containing CBI) to the MS for checking;
- send the process flow diagram(s) showing the waste gas treatment systems and any other supporting documents to the MS. The process flow diagrams and other supporting documents should not contain any CBI.

The Member State (MS) representative will:

- check the quality, completeness and consistency of the information in the full questionnaire;
- create and save a 'non-CBI' version of the questionnaire, using the button provided. A macro is available that will automatically delete all of the CBI in the red cells and add the words 'non-CBI' to the file name.
To save the non-CBI version, go to the worksheet '1. Introductory notes' and click on the button 'Save non-confidential version of this questionnaire'.

Only to be used by MS competent authorities

Once the questionnaire has been checked by the MS competent authorities, this button may be used to automatically remove all confidential business information and save a non-CBI version of the questionnaire.

- post the 'non-CBI' version of the questionnaire, the process flow diagram(s) and any other supporting documents onto BATIS, so that they will be shared with the whole TWG;
- send the full version of the questionnaire (containing CBI) to the EIPPCB by email.

The EIPPCB will:

- anonymise the full questionnaires (containing CBI information) by allocating a CBI reference number to each installation; this reference will be used to identify the installation whenever CBI is used as part of the data assessment and analysis;
store the full questionnaires (containing CBI information) and the reference number information in access-restricted and password-protected electronic folders; the information will only be used by the EIPPCB for the purposes of producing the WGC BREF;
- send each MS a list of all the installation names and CBI reference numbers for the installations in that MS; this will allow the MS to check the performance of their installations whenever anonymised information is used by the EIPPCB.

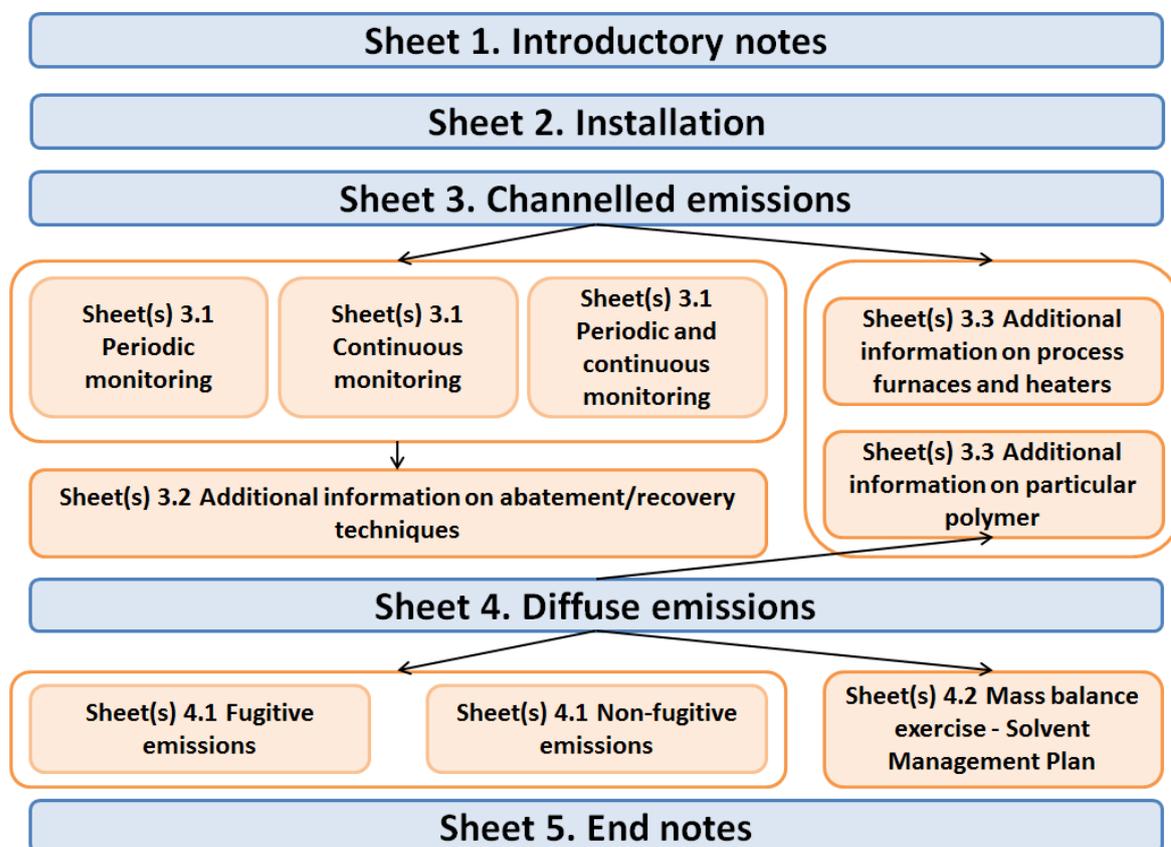
The MS will:

- inform each installation of their CBI reference number; this will allow each installation to identify their data whenever anonymised information is used by the EIPPCB.

Information on data processing and protection can be found in the BREF Guidance ([Commission Implementing Decision 2012/119/EU](#)) and in the [privacy statement published on the EIPPCB website](#).

3 STRUCTURE AND CONTENT OF THE QUESTIONNAIRE

The questionnaire opens with a cover page (not numbered) and is organised according to the following structure:



At first, only those worksheets corresponding to the **blue** rectangles will be visible. As they are filled in, the relevant sheets corresponding to the **orange** rectangles will then appear. Each sheet is focused on a different aspect of the WGC installation and the related emissions to air, as explained in the table below.

Number	Name of the worksheet	Description
1	Introductory notes	General information and contact information of the people who filled in or checked the questionnaire.
2	Installation	Identification and description of the chemical installation, according to the IED permit.
3	Channelled emissions	Identification of the channelled point(s) of emissions to air from the installation and contextual information for each emission point. Filling in this worksheet will create corresponding worksheet(s) 3.1 and 3.3.
3.1*	Periodic measurements**	Monitored substances, description and information on the waste gas treatment systems, monitoring information and results of the measurement of channelled emissions to air. Filling in these worksheet(s) creates corresponding worksheet(s) 3.2.
	Continuous measurements**	
	Periodic and continuous measurements**	
3.2*	Absorption	Additional information on the waste gas treatment techniques or information on the waste gas properties when no treatment technique is applied: information on removed substances, the type of equipment, consumables and operational information.
	Adsorption	
	Bioprocess	
	Cold oxidation	
	Condensation	
	Dust scrubbing	
	Filtration	
	Membrane separation**	
	Gravitational separation**	
	Electrostatic precipitation**	
	Reduction	
	Thermal oxidation**	
Waste gas information**		
3.3*	Polyolefins	Additional information on some particular polymer processes: data on the type of product, type of process, the use of recovery techniques, the concentration of volatile organic compounds or vinyl chloride monomer at the transition point between the closed/open system and emissions to air as specific loads.
	PVC	
	Solution-polymerised rubbers**	
	Viscose	
	Process furnaces/heaters**	
4	Diffuse emissions	Information on diffuse emissions to air and on the monitoring of diffuse emissions. Monitoring includes fugitive and non-fugitive emissions and information from solvent management plans.
4.1*	Fugitive emissions	
	Non-fugitive emissions	
4.2*	Mass balance exercise - Solvent management plan (SMP)**	Filling in worksheet 4 creates corresponding worksheet(s) 4.1 and 4.2.
5	Endnotes	Guidance and detailed instructions to fill in the requested information.
*These worksheets are not initially visible and will be activated or created by filling in the other worksheets.		
** These worksheet names were shortened due to Excel worksheet name restrictions.		

3.1 Introductory notes

Please read the information on this sheet carefully as it contains general warnings for completing the questionnaire and clarifications on the scope of the data collection (for the scope, see also Section 4). This sheet also contains general information on the IED, the 'Sevilla process' and the type of information requested.

On this sheet, basic information is requested about the persons who filled in or checked the questionnaire, so that they can be contacted if questions arise when the EIPPCB analyses the data. These persons may be:

- the person who filled in the questionnaire on behalf of the installation/site/operator;
- the person (if any) who gave assistance (e.g. from an industry association or an NGO);
- the person from the Member State's competent authority who carried out the quality check.

3.2 Installation identification and description

In this sheet, general information about the installation is requested: location, operator name, and installation name. A flow diagram and information on the year when production first started and the year of the latest retrofits are also requested.

This information will be used to create a unique filename for the questionnaire. You can save the questionnaire by clicking on the button 'Save the questionnaire': you will be asked to select a destination folder and the file will be named and saved automatically, using the format 'CountryCode_NameOfTheCompany_NameOfTheInstallation.xlsm'. The file name will use the first 10 letters of the name of the operator and installation. Please use an installation name which ensures that your questionnaire will have a unique filename.

Note: The file's automatic naming and saving functionality will only work when the three cells 'Name of installation', 'Name of the company' and 'Country' are correctly filled in.

1 **Identification of the installation**

Name of the installation:

Name of the company:

Country:

City:

Start of operation (year):

Reference of the IED permit:

Comments:

Substantial changes in the installation having a significant effect on emissions to air

Year	Equipment/Process operation	Aim of the changes (e.g. implementation of new techniques, retrofit of equipment)

Save the questionnaire (auto-naming)

If the installation is located outside the EU, select the option 'Non-EU country'. A white cell will appear next to the choice 'Non-EU country' in order to specify the name of the country.

Information on the flow diagram and any other supporting documents may be indicated in the table at the bottom of the worksheet.

3.3 Channelled emissions to air

On this sheet, information is requested on each of the **monitored channelled emission points** to air, depending on the type of monitoring. This worksheet consists of the following blocks:

- Block 1: Emission sources where only periodic measurement is used;
- Block 2: Emission sources where only continuous measurement is used;
- Block 3: Emission sources where both periodic and continuous measurements are used;
- Block 4: Other cases, the external treatment of channelled emissions.

Clicking on one of the buttons 'Add emission point' will generate a line in the corresponding block where contextual information about the IED activities (product, type of process, process operating time, plant capacity) can be reported.

Information is also required about any associated specific polymer processes (i.e. production of polyolefins, PVC, solution-polymerised rubbers or viscose) or process furnace(s)/heater(s).

Further information on each emission point and corresponding monitoring data should be reported through the 'Measurements' sheet(s) (see Section 3.3.1).

3 Channelled emissions to air				
1 Emissions points where <u>only periodic</u> measurement is used				
Channelled emission sources to air where only periodic measurement is used <input type="button" value="Add emission point"/> <input type="button" value="Delete emission point"/>				
Emission point identification	Production processes	Main chemical activity	Other chemical activity	Other (non-chemical) acti
2 Emissions points where <u>only continuous</u> measurement is used				
Channelled emission sources to air where only continuous measurement is used <input type="button" value="Add emission point"/> <input type="button" value="Delete emission point"/>				
Emission point identification	Production processes	Main chemical activity	Other chemical activity	Other (non-chemical) acti
3 Emissions points where <u>both periodic and continuous</u> measurements are used				
Channelled emission sources to air where both periodic and continuous measurements are used <input type="button" value="Add emission point"/> <input type="button" value="Delete emission point"/>				
Emission point identification	Production processes	Main chemical activity	Other chemical activity	Other (non-chemical) acti

Please note that the plants listed below do not need to complete the worksheet '3. Channelled emissions', except in the case of channelled emissions of NO_x from thermal oxidisers. These are plants producing organic chemicals in continuous processes where the total production capacity of those chemicals exceeds 20 kt/yr, which were covered by the LVOC BREF:

- Lower olefins via the steam cracking process;
- Formaldehyde;
- Ethylene oxide and ethylene glycols;
- Phenol from cumene oxidation;
- Dinitrotoluene (DNT) from toluene, toluene diamine (TDA) from DNT, TDI from TDA, methylene diphenyl diamine (MDA) from aniline, MDI from MDA;
- Ethylene dichloride (EDC) and vinyl chloride monomer (VCM);
- Hydrogen peroxide.

NB: Diffuse emissions from the aforementioned plants are included in the scope of this data collection.

Example: If channelled emissions are monitored using periodic monitoring only

1. Add the appropriate number of emission points where only periodic monitoring is used in Block 1 of the sheet using the button 'Add emission point'. The corresponding lines P1, P2... are displayed and the associated worksheet for reporting monitoring information and measurement results is created (see Section 3.3.1). In this example, the worksheet '3.1 Measurement (P1)' is created.

1 Emissions points where only periodic measurement is used

[Channelled emission sources to air where only periodic measurement is used](#)

Emission point identification	Production processes	Main chemical activity	Other chemical activity	Other (non-chemical) activity
P1	IED activity ▼ Product ▼ Type of process ▼ Process operating time ▼ Plant capacity (t/yr) ▼			

issions | **3.1. Measurement (P1)** | 3.1

2. Complete the requested information on the IED activity, the product, the type of process, the process operating time and the plant capacity using the drop-down menus.

NB: For chemical activities, the drop-down menu 'Product' will only be available after selecting an 'IED activity'. In the case of 'Other (non-chemical) activity', the drop-down menu is replaced by free text.

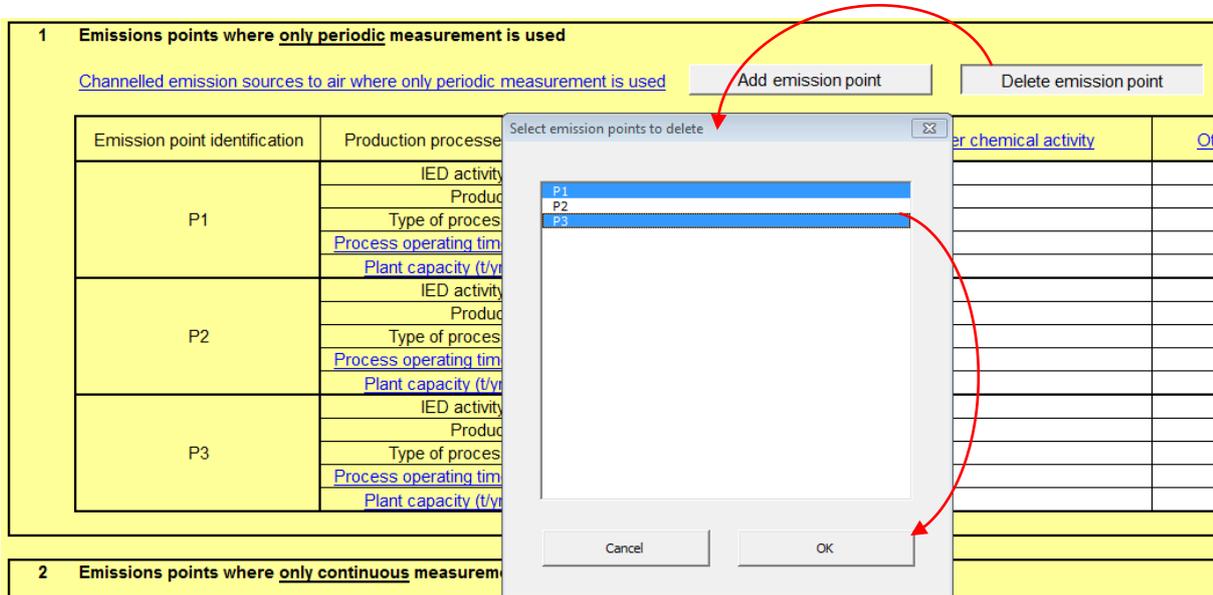
3. Selecting a 'particular polymer production' via the drop-down menu or entering a 'number of process furnaces/heaters' will create the corresponding complementary worksheets (see Section 3.3.4).

Other chemical activity	Other (non-chemical) activity	Particular polymer production ▼	Number of process furnaces heaters
		Polyolefins Polyvinylchloride (PVC) Solution polymerised rubber Viscose None	

The worksheets related to the same emission point (for channelled emissions) or unit (for diffuse emissions) are automatically ordered and the worksheet tabs will appear in the same colour.

To delete one or several emission point(s), click on the button 'Delete emission point'. A list containing all the created emissions points will pop up from the corresponding block. Select the emission point(s) to be deleted and click 'Ok' (you will be asked to confirm the deletion of the selected emission point(s)).

Example: Deleting emission points P1 and P3



NB: Deleting an emission point will irreversibly delete all information entered about this emission point, but also all information and associated worksheets (e.g. measurements, treatment techniques, specific worksheets on polymers or process furnaces/heaters).

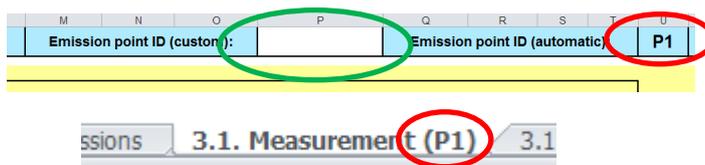
3.3.1 Monitoring information and measurement results

When emission points are created in sheet '3 Channelled emissions' (see Section 3.3), the corresponding worksheet(s) named '3.1 Measurement (P1, P2, .../C1, C2, .../CP1, CP2, ...)' are created. These worksheets will be used to report emission data and information on the waste gas treatment system. Each worksheet consists of the following blocks:

- Block 1: Information on the waste gas (the monitored substances);
- Block 2: Information on the waste gas treatment system;
- Block 3: Other information (emissions from batch processes, reference conditions);
- Block 4: Emissions to air after the final abatement/recovery technique (measurement results and monitoring information);
- Block 5: Emissions to air after the final abatement/recovery technique (measurement results and monitoring information). (This block is only created in the case of both periodic and continuous measurement).

Example: Reporting emissions for the previously created emission point

NB: The emission point identification number appears in the top right corner of the sheet, and on the tab name. It is possible to add a customised name or identifier for the emission point in the top line (green circle). This field is intended to facilitate the identification of the emission point by the operator and/or the competent authority.



1. In Block 1, indicate which substances are monitored in the waste gas for this emission point. The answer 'Yes' will add the corresponding line in Block 4. If the substance is present in the installation, but is not monitored, select 'No'. Otherwise leave the cell empty. Answering 'No' or leaving the cell empty will have no effect on Block 4.

Indicate which (groups of) substances are monitored		▼	4 Emissions to air after the final abatement/recovery technique					
C ₄ H ₆	1,3-Butadiene		Contextual monitoring information					
NH ₃	Ammonia							
C ₆ H ₆	Benzene		Unit	Reference year ▼	Standard monitoring method ▼	Measurement uncertainty (%)	Has the uncertainty already been subtracted? ▼	
CS ₂	Carbon disulphide, <i>only for viscose production</i>							
CO	Carbon monoxide		Chloromethane (CH ₃ Cl)	mg/Nm ³	2017			
CH ₃ Cl	Chloromethane	Yes			2016			
CH ₂ Cl ₂	Dichloromethane		Dust	mg/Nm ³	2017			
PCDD/F	Dioxins and furans				2016			
	Dust	Yes	Elementary chlorine (Cl ₂)	mg/Nm ³	2017			
	Dust - PM _{2.5}				2016			
	Dust - PM ₁₀		2015					
Cl ₂	Elementary chlorine	Yes						
C ₂ H ₄ Cl ₂	Ethylene dichloride (EDC)							
C ₂ H ₄ O	Ethylene oxide							
CH ₂ O	Formaldehyde							
HCl	Gaseous chlorides (expressed as HCl)							

NB: When both continuous and periodic measurements are used, the options of the 'Yes/No' drop-down menu are replaced by the options: 'Periodic', 'Continuous' or 'Not monitored'. If the substance is present in the installation, but is not monitored, select 'Not monitored'. Otherwise, leave the cell empty. The lines will then be displayed under the relevant format for reporting (periodic or continuous).

If both sets of data are available (e.g. periodic monitoring as requested by the competent authority and continuous monitoring as operator self-monitoring) please report the data set corresponding to the requirements of the IED permit.

- In Block 2, provide information on the different treatment techniques applied to the waste gas stream. It is possible to enter up to five techniques, whether these are operated in parallel or one after the other.

Once a technique is selected through the drop-down menu, a worksheet corresponding to the technique is created so that further information can be provided (see Section 3.3.2).

Information on waste gas treatment system		Waste gas treatment technique ▼
1	Final abatement or recovery technique	
2	Other abatement or recovery technique applied before final abatement/recovery	No waste gas treatment technique (please explain) Absorption Adsorption Bioprocess Cold oxidation Condensation Dust scrubbing Electrostatic precipitation (ESP)
3	Other abatement or recovery technique applied before final abatement/recovery	
4	Other abatement or recovery technique	

- In Block 3, provide complementary information on the process (emissions from batch processes, reference conditions).
- In Block 4 (and 5), report monitoring information and data available on the substances selected in Block 1.

The measurement values have to be reported in concentrations (mg/Nm³) except for dioxins and furans.

NB: For dioxins and furans, the unit can be selected via a drop-down menu: ng WHO-TEQ/Nm³ or ng I-TEQ/Nm³.

Dioxins and furans (PCDD/F)	ng WHO-TEQ/Nm ³	2017
	ng I-TEQ/Nm ³	2016
		2015

If relevant, please provide information on batch processes, to better understand the levels of emissions to air reported, e.g. presence or absence of monitored substances, the emission profile for each measurement point.

The most recent measurements should be reported for reference years to be selected in the drop-down menu, preferably the last three years (2018 if available or 2017, 2016, 2015). If emission data are not available for these years (e.g. if monitoring does not take place every year or if the data do not appropriately represent the typical operating conditions, e.g. due to major equipment breakdown or malfunction), data from other recent years may be reported. Other reference years can be selected by the drop-down menu from 2008 to 2018.

Benzene (C ₆ H ₆)	mg/Nm ³	2017
		2016
		2015
Carbon disulphide (CS ₂)	mg	2015
		2014
		2013
		2012
		2011
		2010
		2009
		2008

3.3.2 Additional information on abatement or recovery techniques

When a worksheet is created to provide additional information on a technique (see Section 3.3.1), the emission point identification number appears in Block 1 of the sheet, and in the tab name. The tab name also mentions the number of the technique as shown on sheet '3.1 Measurement'.

1 Identification	
Technique associated with point of emission:	P1

Information on waste gas treatment system	
	Waste gas treatment technique ▼
1	Final abatement or recovery technique
	Absorption

(Information entered on sheet '3.1 Measurement (P1)')

The TWG decided to collect contextual information on the waste gas treatment techniques. They have been grouped by working principles:

- No waste gas treatment technique (to be explained)
- Absorption
- Adsorption
- Bioprocess
- Cold oxidation
- Condensation
- Dust scrubbing
- Electrostatic precipitation (ESP)
- Filtration
- Gravitational separation
- Membrane separation
- Reduction
- Thermal oxidation

Please note that these worksheets will be generated automatically, according to the input from sheets '3.1 Measurement'.

Each worksheet follows the same structure and consists of the following blocks:

- Block 1: Identification of the associated emission point;
- Block 2: Removed substances;
- Block 3: Information on the equipment;
- Block 4: Waste gas properties after treatment;
- Block 5: Operational data – consumables;
- Block 6: Other operational information.

If relevant, substances other than KEI substances may be indicated in Block 2 by selecting the option 'Other' in the drop-down menu and specifying the name of the substance(s) in the comments below.

2 Removed substances			
	Substance	Removal purpose ▼	Removal efficiency (%)
Removed substance 1 ▼	Other (Specify in comments)		
Removed substance 2 ▼			
Removed substance 3 ▼			
Removed substance 4 ▼			
Removed substance 5 ▼			

Waste gas properties may significantly vary under normal operating conditions. This may be indicated in Block 4 by the answer 'Yes'. Then, up to 12 values for each parameter can be reported corresponding to the measurement points reported on sheet '3.1 Measurement' (see Section 3.3.1).

4 Waste gas properties after the absorption equipment												
Do the waste gas properties vary significantly under normal operating conditions? ▼		Yes ▼										
Measurement point number	1	2	3	4	5	6	7	8	9	10	11	12
Flow (Nm ³ /h)												
Humidity (%)												
Temperature (°C)												

In Block 5, 'operational data – consumables' should be calculated as long-term averages such as yearly averages. The data may be calculated based on measurements of the consumption of the applied waste gas treatment technique (e.g. electricity and water) and the information on waste gas flow over a given operating time.

Please provide contextual information on the waste gas treatment technique in Block 6 'Other operational information', such as:

- characteristics of a specific waste gas treatment technique;
- maintenance activities.

All operational data should refer to normal operating conditions. Information can be reported as a range (minimum value, maximum value, typical or average value).

3.3.3 Information on waste gas properties when no treatment technique is applied

When no treatment technique is applied, further information on the waste gas properties is requested through the worksheet '3.2 Waste gas info'. This worksheet is related to the emission point and asks for waste gas properties flow, humidity and temperature.

3.2 Information on waste gas when no treatment technique is applied

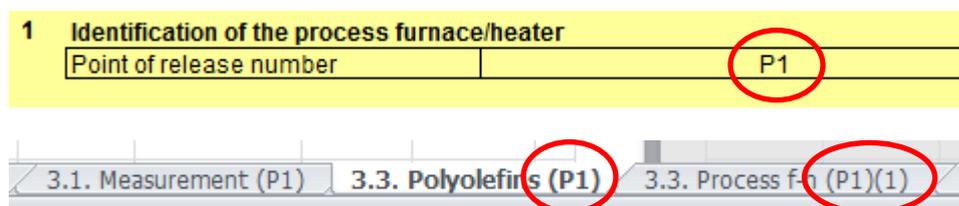
1 Identification	
Information associated with point of emission:	automatic
2 Waste gas properties	
Do the waste gas properties vary significantly under normal operating conditions? ▼	
Flow (Nm³/h)	
Humidity (%)	
Temperature (°C)	
Comments	

Similarly to the other worksheets on abatement or recovery techniques, for periodic measurements in the case of significant variation in the waste gas properties under normal operating conditions, different values for each parameter can be reported corresponding to the measurement points reported on sheet '3.1 Measurement' (see Section 3.3.1) by selecting the answer 'Yes'.

3.3.4 Complementary worksheets

The TWG decided to collect contextual information in the case of the production of the following polymers: polyolefins, PVC, solution-polymerised rubbers and viscose or when using process furnace(s)/heater(s) for production.

When a worksheet is created to provide further contextual information (see Section 3.3), the emission point identification number appears in Block 1 of the sheet, and in the tab name. For process furnace(s)/heater(s), as there can be several, the number is also mentioned in the tab name.



3.3.4.1 Process furnace(s)/heater(s)

The structure of the worksheet consists of the following blocks:

- Block 1: Identification of the associated emission point;
- Block 2: Type of product;
- Block 3: Type of process furnace/heater;
- Block 4: Operational information.

3.3.4.2 Polymer production of polyolefins, PVC, solution-polymerised rubbers and viscose

The structure of the worksheets consists of the following blocks:

- Block 1: Identification of the associated emission point;
- Block 2: Information on production;
- Block 3: Emissions to air (channelled and diffuse) as specific loads.

Please note that for the production of these four polymers additional emission data are requested expressed as specific loads for an averaging period of the corresponding year).

The emission data expressed as concentrations are to be reported using sheet '3.1 Measurement' (see Section 3.3.1).

NB: Polymer worksheets can be created using either:

- Sheet '3. Channelled emissions' (see Section 3.3) in association with an emission point: this is typically the case when the emissions coming from the polymer production are channelled;
- Sheet '4. Diffuse emissions' in association with a unit: this is typically the case when the emissions coming from the polymer production are not channelled and are considered diffuse emissions.

If the emissions from the polymer production are shared over several emission points, please only create and fill in one polymer worksheet, and describe this specific configuration using the comments.

3.4 Diffuse emissions to air

On this sheet, general information on diffuse emissions to air is requested. First, enter the number of units where diffuse emissions are monitored, as described in the IED permit. If the permit requirements for diffuse emissions do not apply to any unit in particular but to the whole plant, then enter '1'.

1 Monitoring of diffuse emissions (including calculation/estimation)

Number of units where diffuse emissions are monitored:

Example:

1 [Monitoring of diffuse emissions \(measurement and calculation/estimation\)](#)

Number of units where diffuse emissions are monitored:

Unit identification	Unit description	Main chemical activity	Purpose of monitoring ▼	Number of solvent management plan(s) (mass balance exercise)	Particular polymer production ▼
U1	IED activity ▼				
	Product ▼				
	Type of process ▼				
	Process operating time ▼				
	Production capacity (t/yr) ▼				
	Are fugitive emissions monitored? ▼				
	Are non-fugitive emissions monitored? ▼				

If fugitive or non-fugitive emissions are monitored and if mass balance exercises (as solvent management plan(s)) are available, corresponding worksheets for each waste gas treatment technique will be created when the answer 'Yes' is selected for fugitive/non-fugitive emissions (see Section 3.4.1) or the number of SMPs (see Section 3.4.2) is entered.

1 [Monitoring of diffuse emissions \(measurement and calculation/estimation\)](#)

Number of units where diffuse emissions are monitored:

Unit identification	Unit description	Main chemical activity	Purpose of monitoring ▼	Number of solvent management plan(s) (mass balance exercise)
U1	IED activity ▼			
	Product ▼			
	Type of process ▼			
	Process operating time ▼			
	Production capacity (t/yr) ▼			
	Are fugitive emissions monitored? ▼	Yes		
	Are non-fugitive emissions monitored? ▼	Yes		

1

4. Diffuse emissions | 4.1. Fug. emissions (U1) | 4.1. Non-fug. emissions (U1) | 4.2. SMP (U1)(1)

3.4.1 Fugitive/non-fugitive emissions to air

3.4.1.1 Fugitive emissions to air

Please note that this worksheet is generated automatically, according to the input (see Section 3.4). As for the worksheets on channelled emissions (see Section 3.3), the sheets for diffuse emissions are given an automatic identifier. To facilitate the identification of the unit (when relevant) by the operator and/or the competent authority, a customised identifier can be added (green circle).

F	G	H	I
Unit ID (custom):		Unit ID (automatic):	U1

The structure of the worksheet consists of the following blocks:

- Block 1: Inventory of fugitive emission sources;
- Block 2: Prevention of fugitive emissions;
- Block 3: Measurement methods;
- Block 4: Calculation methods;
- Block 5: Leak detection and repair programme (LDAR);
- Block 6: Quantification of fugitive emissions.

Blocks 1 to 5 initially each show a single question and a comments box. If the answer 'Yes' is selected via a drop-down menu, then the box will be expanded to show additional questions.

1 Inventory of fugitive emission sources	Is there an inventory of fugitive emission sources? <input type="button" value="▼"/>	Comments	
2 Prevention of fugitive emissions	Are there measures to prevent fugitive emissions? <input type="button" value="▼"/>	Comments	
3 Measurement methods	Are fugitive emissions monitored at source? (using e.g. sniffing or optical gas imaging) <input type="button" value="▼"/>	Comments	
4 Calculation methods	Are fugitive emissions calculated or estimated? <input type="button" value="▼"/>	Comments	
5 Leak detection and repair programme (LDAR)	Does the unit apply a leak detection and repair program? <input type="button" value="▼"/>	Comments	

3.4.1.2 Non-fugitive emissions to air

Please note that this worksheet is generated automatically, according to the input (see Section 3.4). The structure of the worksheet consists of the following blocks:

- Block 1: Inventory of non-fugitive emission sources;
- Block 2: Actions to reduce non-fugitive emissions;
- Block 3: Monitoring of non-fugitive emissions;
- Block 4: Quantification of non-fugitive emissions.

3.4.2 Mass balance exercise - Solvent management plan (SMP)

Please note that this worksheet is generated automatically for each unit, according to the input (see Section 3.4).

The KEI substance(s) to which the solvent management plan (SMP) applies, the reason for realising a mass balance exercise, the criteria for realising it, as well as the year of reference, have to be specified. The structure of the worksheet corresponds to IED, Annex VII, Part 7 'Solvent management plan'. The use of an SMP may be part of the IED permit requirements, or it may simply be used as a tool to perform the mass balance exercise.

3.5 Endnotes

On every worksheet, some cells are hyperlinked to the endnotes for further clarification, description or guidance on how to complete the questionnaire. Hyperlinked text is blue and is underlined. To return to the initial worksheet, click on the button 'Back to worksheet'.

[Back to worksheet](#)

4 ANNEX: SCOPE OF THE DATA COLLECTION

This annex is meant to facilitate the understanding of the scope of the data collection. The exhaustive decisions and descriptions concerning the scope can be found in the Kick-off Meeting Report of the drawing up of the WGC BREF¹.

The scope of this data collection covers **channelled and diffuse emissions to air from chemical installations**. In particular, this data collection includes emission data of the following substances:

(Groups of) Substances included in the scope	Comments
1,3-Butadiene	
Ammonia (NH ₃)	
Benzene	
Carbon disulphide (CS ₂)	only for viscose production
Carbon monoxide	
Chloromethane	
Dichloromethane	
Dust	including PM ₁₀ and PM _{2.5} data*
Elementary chlorine (Cl ₂)	
Ethylene dichloride (EDC)	
Ethylene oxide	
Formaldehyde	
Gaseous chlorides (expressed as HCl)	including HCl data*
Gaseous fluorides (expressed as HF)	
Hydrogen cyanide (HCN)	
Hydrogen sulphide (H ₂ S)	only for viscose production
Lead and its compounds (as Pb)	
Nickel and its compounds (as Ni)	
Nitrogen oxides (NO _x), expressed as NO ₂	
Nitrous oxide (N ₂ O)	
PCDD/Fs (dioxins + furans)	as I-TEQ and WHO-TEQ*
Propylene oxide	
Sulphur oxides (SO _x), expressed as SO ₂	
Tetrachloromethane (CCl ₄)	
Toluene	
Trichloromethane	
TVOC (Total volatile organic compounds)	if TVOC data are not available then report data as non-methane VOC (NMVOC)
Vinyl chloride monomer (VCM)	
*When such data are available.	

¹ <http://eippcb.jrc.ec.europa.eu/reference/>

The scope of this data collection also covers **channelled and diffuse emissions to air from:**

- chemical plants which carry out the physical purification and reconcentration of spent sulphuric acid and do not use sulphur dioxide as a feedstock, if they are co-located/integrated/associated with a process that is included in the scope of the WGC BREF;
- reformers, if they are co-located/integrated/associated with a process that is included in the scope of the WGC BREF, and standalone reformers;
- emissions of NO_x from thermal oxidisers;
- the storage, transfer and handling of materials only where these are directly associated with the chemical production process. This includes the combined treatment of waste gases in those cases where a share of the pollutant load originates from the storage, transfer and handling of materials.

The following emissions are excluded from the scope of this data collection:

1) **Channelled and diffuse emissions** from plants producing chlorine, hydrogen, and sodium/potassium hydroxide by the electrolysis of brine (see CAK BREF).

2) **Channelled emissions** from plants producing the following organic chemicals in continuous processes where the total production capacity of those chemicals exceeds 20 kt/yr (see LVOC BREF):

- Lower olefins via the steam cracking process;
- Formaldehyde;
- Ethylene oxide and ethylene glycols;
- Phenol from cumene oxidation;
- Dinitrotoluene (DNT) from toluene, toluene diamine (TDA) from DNT, TDI from TDA, methylene diphenyl diamine (MDA) from aniline, MDI from MDA;
- Ethylene dichloride (EDC) and vinyl chloride monomer (VCM);
- Hydrogen peroxide.

NB: Emissions of NO_x from thermal oxidisers are included in the scope of this data collection.

3) **Channelled and diffuse emissions** from plants producing the following inorganic chemicals (see LVIC-AAF and LVIC-S BREFs):

- Ammonia;
- Calcium carbide;
- Carbon black;
- Hydrofluoric acid, phosphoric acid, nitric acid, sulphuric acid, oleum;
- Inorganic phosphates;
- Phosphorus-, nitrogen- or potassium-based fertilisers (simple or compound fertilisers);
- Soda ash, calcium chloride and precipitated calcium carbonate;
- Sodium chlorate;
- Sodium silicate;
- Synthetic amorphous silica (SAS);
- Titanium dioxide, ferrous chloride and ferrous sulphate (copperas).

4) **Channelled and diffuse emissions** from:

- combustion plants (see LCP BREF and MCP Directive), except for process furnaces/heaters used in the chemical industry with a total rated thermal input equal to or greater than 1 MW, which are included in this data collection;
- process furnaces/heaters with a total rated thermal input below 1 MW;
- process furnaces/heaters used in lower olefin and ethylene dichloride crackers.

5) **Channelled and diffuse emissions** from waste incineration plants (see WI BREF).

6) **Channelled and diffuse emissions** from indirect cooling systems (see ICS BREF).

5 GLOSSARY

NB: This glossary is meant to facilitate the understanding of the information contained in the questionnaire. The definitions of terms in this glossary are not legal definitions (although some of them may coincide with the definitions given in European legislation); they are meant to help the reader understand some key terms in the context of their use in the questionnaire.

More detailed information about technique descriptions and the associated parameters (consumables, operational data, etc.) can be found in the CWW BREF.

Absorption	Absorption (or wet scrubbing) is a mass transfer between a soluble gas and a solvent – such as water (acid, alkaline or neutral) – in contact with each other.
Adsorption	Adsorption is a heterogeneous reaction in which gas molecules are retained on a solid or liquid surface such as active coal or zeolites and thus removed from effluent streams.
Bioprocess	In the case of biological cleaning, the incoming gas stream is led through a column or filter bed consisting of microorganisms on a carrier material. The microorganisms break down the pollutants. This includes techniques such as biofiltration, biotrickling or bioscrubbing.
CBI	Confidential Business Information
Channelled emissions	Emissions of pollutants into the environment through any kind of duct, pipe, stack, etc. This also includes emissions from open-top biofilters.
CMR	Carcinogenic, mutagenic and reprotoxic substances or mixtures according to the EU legislation regarding the classification, labelling and packaging of substances (Regulation 1272/2008).
Cold oxidation	In the case of cold oxidation, no rise in temperature occurs. Charged particles cause the breakdown and partial oxidation of any pollutants present. This includes techniques such as ionisation and photo-oxidation.
Condensation	Condensation is a technique that eliminates solvent vapours from a waste gas stream by reducing its temperature below its dew point. This includes techniques such as condensation and cryogenic condensation.
Continuous measurement	Measurement with an automated measuring system (AMS) permanently installed on site for continuous monitoring of emissions, according to EN 14181:2004.
Cross-media effect	Possible shift of environmental pressure from one environmental medium to another.
Diffuse emissions	Non-channelled emissions to the environment. Emissions usually concern volatile or dusty substances. Diffuse emission sources can be point, linear, surface or volume sources. Examples include the open-air storage of solid materials or the operation of storage facilities during loading and unloading. Multiple emissions inside a building are normally considered diffuse emissions.
Dust scrubbing	Dust scrubbing is a technique where dusts are separated from air using water. This includes the venturi scrubber and the spraying tower.
EIPPCB	European IPPC Bureau within Directorate B of the European Commission's Joint Research Centre.
Electrostatic precipitation	An electrostatic precipitator (ESP) is a particulate control device that uses electrical forces to move particles within a waste gas stream onto collector plates. This includes techniques using dry wire plate/pipe and wet wire plate/pipe.

Emission	Direct or indirect release of substances from individual or diffuse sources in the installation into air (Article 2(4) of the IED).
Emission limit value	The mass, expressed in terms of certain specific parameters, concentration and/or level of an emission which may not be exceeded during one or more periods of time.
Emission point	Emission point of channelled emissions to air (e.g. stack).
Filtration	Filters work based on a filter medium that filters the dust from the incoming polluted gas. The dust remains on the filter. This includes techniques such as fabric or ceramic filters.
Fugitive emissions	Emissions resulting from looseness of equipment and piping systems that are designed to be tight. The most common emission points are valve stems, flanges, pump shafts and open ends. Internal leaks of safety valves discharging to atmosphere are included in fugitive emissions and can lead to significant emissions if undetected.
Gravitational separation	Techniques that are based on the principle of separation by gravitation such as the settling chamber and the cyclone.
Installation	Stationary technical unit within which one or more of the activities listed in Annex I to Directive 2010/75/EU are carried out and any other directly associated activities on the same site which have a technical connection with the activities listed in Annex I and which could have an effect on emissions and pollution.
Non-accessible equipment/source	Equipment/source requiring special measures to be monitored such as scaffolding, removal of equipment's insulation.
Non-fugitive emissions	Diffuse emissions other than fugitive emissions (storage tanks, loading/unloading of mobile containers, sewers, sampling points, etc.).
Normal operating conditions	The conditions during which an installation is operating and releasing emissions into the air, excluding other than normal operating conditions. Please note that normal operating conditions may include operation with higher load factors (i.e. closer to nominal load factor), as well as lower load factors (i.e. closer to minimal load), depending on the installation demand or design.
Other than normal operating conditions (OTNOC)	Article 14(f) of the IED refers to other than normal operating conditions as start-up and shutdown operations, leaks, malfunctions, momentary stoppages and definitive cessation of operations.
Periodic measurement	Determination of a measure (particular quantity subject to measurement) at specified time intervals using manual or automated methods. For periodic measurements, the result of a measurement is an average over the sampling period, preferably as agreed by the TWG, i.e. 30 minutes for measurements of emissions to air.
Pretreatment technique	Technique to abate pollutants before the final waste water treatment. Pretreatment can be carried out at the source or in combined streams (before or after mixing the waste water streams).

Process furnaces or heaters	<p>Process furnaces or heaters are:</p> <ul style="list-style-type: none"> • combustion units whose flue-gases are used for the thermal 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. <p>It should be noted that, 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 considered to be an integral design feature of the process furnace/heater that cannot be considered in isolation.</p>
Recovery	Any operation, the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.
Reduction	Selective reduction of NO _x by injecting a reducing reagent. This includes techniques such as selective non-catalytic reduction (SNCR), selective catalytic reduction (SCR) and non-selective catalytic reduction (NSCR).
Solvent management plan	Reporting on compliance may include a solvent management plan prepared in accordance with Part 7 of Annex 7 (Article 62 of the IED). Annex 7 includes activities using organic solvents, with regard to the WGC BREF the manufacturing of pharmaceutical products and rubber conversion.
Specific load	Mass of pollutant released per mass of product manufactured or mass of raw material used.
Substance	Chemical element and its compounds, with the exception of radioactive substances, genetically modified microorganisms and genetically modified organisms as defined in Article 3(1) of the IED.
Substantial change	Change in the nature or functioning, or an extension, of an installation which may have significant negative effects on human health or the environment (Article 3(9) of the IED).
Thermal oxidation	Thermal oxidation implies the combustion of incoming gas streams at high temperatures. This includes techniques such as catalytic oxidation.
Total rated thermal input	Permitted total rated thermal input of all process furnaces/heaters connected to the stack where emissions occur.
TWG	Technical working group: in this case, the group formed of Member States' representatives, industry groups, an environmental non-governmental organisation and the European Commission in charge of drawing up the WGC BREF.
VOC	Volatile organic compound: any organic compound, as well as the fraction of creosote, having at 293.15 K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.
Waste gas	Any gas leaving a process which is not a product (includes exhaust gas, off-gas and flue-gas).