Evaluation Manual for the Authorisation of biocides

NL transitional legislation part

Biocides

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ctgb

Board
for the authorisation
of plant protection products and biocides

NL Transitional Legislation part
Biocides

Changes made in the Evaluation Manual

Evaluation Manual Biocides NL Transitional Legislation part			
Version	**Date**	**Paragraph**	**Changes**
1.0	January 2013		There was no version 1.0 Original version is the BZT guidance
2.0	October 2016		First version written
2.1	June 2017	Paragraph and page number	Changes
		Appendix 1B Page 33	A description and reference is made to the document “Dermal absorption of PT21 active substances”
		Appendix 1B Page 34	A description and reference is made to the final guidance on Disinfection By-Products.
2.2	November 2017	2.2.2.1 and 2.2.2.2	Volume II Efficacy Part B/C: Efficacy Assessment and Evaluation is included (version 1.0, published February 2017). Since all transitional guidances are included in Vol II Efficacy Part B/C, information on these guidances is removed. Links to information sources on resistance development and resistance management have been added.

1. INTRODUCTION TRANSITIONAL LEGISLATION (TL) FRAMEWORK

The general introduction of 1) the EU-part of the BPR Evaluation Manual, 2) the NL-part of the BPR Evaluation Manual and 3) the Evaluation Manual for applications for authorisation of a biocidal product according to transitional legislation (TL) in the Netherlands concerns generic information about legislation, data requirements and scientific assessments.

As described in the general introduction applications for authorisation of a biocidal product based on an active substance in the European review programme that is not yet included on the Union list of Approved Active Substances or Annex I of the BPR (512/2012) must be submitted under transitional legislation to the Ctgb. This chapter describes the data requirements and the aspect specific assessments according to NL transitional legislation (TL) under Wgb 2007 (2011); art. 49 and Bgb and Rgb.

2. TL FRAMEWORK

In general for all aspects the same methods as already available in the EU-part, and in the NL part of the BPR Evaluation Manual are used (sometimes including a transitional period). Therefore, the new elements as substance of concern and in situ generated active substances described in the BPR not pertained to a specific aspect as physical chemical, efficacy, human toxicology and environment, described in the general introduction, are already used by the Ctgb under TL framework (see general introduction in the EU-part of the evaluation manual).

2.1. General data requirements

This paragraph deals with the requirements which have to be met by the dossier that must be submitted with the application. Furthermore, this paragraph contains an overview of the subjects which must be dealt with in the dossier when applying for an original authorisation.

The application for authorisation for a notified biocidal product consists of:

- A fully completed application form (Form B, see at regular authorisation under transitional legislation on the Ctgb Website).
- A complete dossier for both the biocidal product and the active substance(s).
- A complete set of appendices to the dossier on the Practical Use of Biocides and the composition. In addition, a List of Endpoints (LoEP) is completed for each active substance. Only an English template is available for this LoEP.

The different components of a complete application for the assessment for the different aspects (excluding the procedural components) are summarised in Table 2.1.1.

Table 2.1.1.: Overview of components which must be included in a complete application for authorisation

Component	Explanation	Check
Transitional legislation (TL) application form	To be completely filled in: this contains general information on the biocidal product. Can be downloaded from www.ctgb.nl Form B	
Description of the use of the biocidal product: • WG/GA as a draft label text • Appendix PGB-PUB	This is done with two instruments, which must both be included in the dossier: • Drafts of Legal Instructions for Use and Directions for Use (WG/GA) • Practical Use of Biocides (PGB) Format of these documents can be downloaded from http://www.ctgb.nl/en/biocidal-products/application-forms	
Complete composition of biocidal product: Appendix - Composition	This appendix can be downloaded from http://www.ctgb.nl/en/biocidal-products/application-forms	
Efficacy studies (in the form of an appendix to the TL application form)	Relevant studies, including an evaluation and analysis of the data and a conclusion which is valid for the field of use applied for. Next to the full study reports, a summary of the efficacy data should also be provided as part of the dossier.	
For each biocidal product and active substance: an LoEP Appendix	This list contains relevant endpoints in the following areas: • Physical and chemical properties; • Human toxicology (risks for humans); • Environmental toxicology (risks for the environment).	
Letters of Access	These must always be included if use is made of protected information from third parties.	
For the biocidal product, all active substances and co-formulants: MSDS	The safety information sheet or MSDS should not be older than 5 years and must be prepared in accordance with Article 31 and	

	Annex II II of the REACH regulation 1907/2006/EU .	
Substances of concern	The applicant has to provide information whether co-formulants have to be considered as substances of concern. Also provide the data necessary to evaluate the substance of concern.	
For the biocidal product , the requirements described in the (draft) BPC opinion	All relevant conditions (2.3), elements to be taken into account(2.5) and requirements for further information (2.5) laid down in the (draft) approval decision in the (draft) BPC opinion should be taken into account.	

The overview provided can be used to check all the information required. Some of these subjects are explained further.

2.1.1 Transitional legislation (TL) application form

The forms (Form B) that are needed for the application can be downloaded from the Ctgb website. On this website also further information on the legal framework, and some Frequently Asked Questions (FAQs) can be found.

2.1.2 Description of the use of the biocidal product

In order to be able to prepare an assessment, the Ctgb needs information about the characteristics of the biocidal product and the active substance(s). The description of the use of the biocidal product is an important part of this information. This information must be provided with the application. After all, it must be clear which applications the biocidal product will be used for and in what manner (application method, dose, etc.). Only then will it be possible to carry out an efficacy assessment and a risk assessment which covers all the risks involved in its use. It must also be clear to the user which application he may use the biocidal product for and how he can do so in a responsible and safe fashion.

For describing the use of the biocidal product, two instruments are available:

- The draft Legal Instructions for Use and Directions for Use (WG/GA)
- The Practical Use of Biocides (PGB-PUB)

These two instruments are described below.

Draft Legal Instructions for Use and Directions for Use (WG/GA)

In order to promote the proper use of authorised pesticides and facilitate the assessment of the risk by the Ctgb, a good description of the field of use (draft of the Legal Instructions for Use) and the directions for use of the biocidal product must be available. Drafts of these texts must be submitted with the application in which the following aspects (if relevant) are dealt with:

A. Legal Instructions for Use (WG):

- The purpose (product type) and function (e.g. preventive, curative, maintenance) for which the product may be exclusively used and/or those for which it may not be used;
- The fields of use and groups of appliers/users which can be identified who may or may not apply/use the product (e.g. hospitals and other institutions in the healthcare sector (with the exception of kitchens in hospitals), maritime vessels, industrial uses, professional users, non-professional users);
- Location where the product may be exclusively used and/or where it may not be used (e.g. indoor/outdoor use, contact/no contact with water/soil);
- The spectrum over which the product is biologically effective (target organisms and, when relevant, developmental stage) and the mechanism of operation of the product (e.g. toxic effect, repellent effect) and the possible duration of the delayed effect;

- The systems in which and the technical tools/equipment with which the product may be used (e.g. vacuum/pressure impregnation, squirting, spraying, brushing, injecting, aerosol, dosing installation, by hand, trapping containers, open/closed system);
- The safety intervals/periods to be complied with when using the product (where relevant).
- Please note that the WG should always include a legal sentence stating that 'The directions for use as mentioned under B need to be followed up'.

B. Directions for Use (GA):

- Description of the procedure to be followed for:
  - mixing and loading (e.g. for a mixing installation/manual use);
  - the application phase (e.g. vacuum/pressure impregnation, squirting, spraying, brushing, injecting, aerosol, dosing installation, by hand);
  - the waste stage of the product (e.g. waste remains of the product after application/use, processing material and/or target organisms treated with the product);
- The duration, frequency and place of the application of the product;
- The climatological and other conditions under which the product can be used (e.g. temperature, pH, indoor/outdoor use, pre-clean or not);
- If there is a risk that resistance or cross resistance will develop, then measures should be specified within the framework of resistance management
- The concentration of the product in the working solution used, the applicable dilutions (e.g. expressed in millilitres of product in 1 litre of solution, or % working solution (w/w, w/v),
- The dosage levels at which the working solution is to be used (e.g. expressed in grams or kilos per m^2 of surface treated or per m^3 of material treated);
- The concentration of the active substance in the product and in the working solution can, if desired, be included in the WG/GA, but it is at any rate required as background information for assessing the risk posed to the user, to public health and to the environment and should be included in the PGB-PUB;
- Description of the personal protective measures to be taken;
- Description of the measures to be taken to prevent release to the environment.

The above aspects must be presented in the WG/GA briefly, succinctly and clearly. This must be done in the Dutch language. The WG/GA may not contain any superfluous information or advertising/promotional texts (such as New! With floral scent!) and may not include any elements which are already regulated by law.

The information in this section should be viewed as a guideline for preparing a draft WG/GA. Each individual WG/GA will, in the end, be determined by the Ctgb separately per product upon authorisation of the product on the basis of specific user applications, the wishes of the applicant, and factors resulting from the assessment (limitations in use, protective measures for people and the environment etc.). To prepare the WG/GA, Appendix WG/GA is available with the application forms on the Ctgb website.

Examples of WG/GAs can be found in the pesticides database on the Ctgb website.

The Practical Use of Biocides (PGB-PUB)
In addition to the WG/GA, a systematic description of the use of the biocidal product must be provided. The Ctgb needs this description to prepare the risk assessment for the biocidal product. To prepare this description, Appendix PGB-PUB is available with the application forms on the Ctgb website.

The PGB-PUB plays a central role in the evaluation of the application for authorisation. Past experience has shown that the preparation of a WG/GA and the associated PGB-PUB presents a difficult challenge. This is due to the fact that, on the one hand, the applicant wishes to specify as broad a field of use as possible in the WG/GA whereas, on the other hand, the Ctgb, in preparing the risk assessment, wishes to specify the exact conditions of use whereby no undesirable effects occur. Make sure that the information given in the WG/GA and PGB/PUB does not contradict each other.

2.1.3 Reliable endpoints

Reliable endpoints must be provided for the following aspects: physical and chemical properties, and risk for humans and for the environment. In addition, this paragraph explains what reliable endpoints are and which endpoints must be provided and describes which sources can be used for the derivation of reliable endpoints. Some endpoints may not have to be provided, but in that case a sound scientific basis must be provided for this.
Information on physical and chemical properties, human toxicological properties, and environmental characteristics of the active substance(s) must be provided in the form of “reliable endpoints.”

Reliable endpoints must be submitted in the List of Endpoints (LoEP) appendix together with the application. For each endpoint provided, the source must be specified from which the endpoint has been taken or deduced, including the date. If this information is missing, the Ctgb will not be able to determine whether the endpoint provided is “reliable” and the application will be considered incomplete and will be rejected.

With the help of reliable endpoints, the Ctgb will be able to prepare an evaluation once the application has been accepted.

Endpoints are scientifically based values, index numbers or characterisations which express a property of a substance or product. Such endpoints make it possible to evaluate the substance or product. Reliable endpoints are endpoints whose scientific quality is such (deduced by whom, how and when) that the Ctgb has confidence in the values concerned and is prepared to use them in the evaluation.
In order to save time and money the applicant is requested to summarise the studies from which these endpoints are derived in case these studies are not already included in the CAR.

Categories of reliable endpoints:

1. Endpoints derived from the applicant's own research;
2. Endpoints obtained on the basis of a “Letter of Access” (this applies to the CAR and Ctgb dossier);
3. Endpoints from reliable sources;
4. Endpoints derived from research contained in the publicly available literature.

Some examples of endpoints are presented in Table 2.1.2.

Table 2.1.2.: Examples of how to submit reliable endpoints.

No.	Subject	Description or value + unit	Source*	Endpoint determined by**
6.1.1	Rat LD_{50} oral	Male rat 2000 mg/kg body weight Female rat 1200 mg/kg body weight	1	A
7.5.5.1	Bioconcentration factor (BCF)	Whole fish: 250 L/kg	2	B

*Sources:
1) CA report of active X for PT18; May 2009
2) Firm Y, Determination of BCF for active X, GLP study 2007
**Endpoints by:
A) Spain as Reporting Member State of active X for PT18
B) RIVM 2008

Note that submitted ecotoxicity studies will be evaluated by the Ctgb conform CRED, an updated method on reporting and evaluating ecotoxicity data. The generic principles of this evaluation system are, however, broader and can be applicable for all types of studies:

http://www.ncbi.nlm.nih.gov/pubmed/26399705?dopt=Abstractplus&otool=inlrivmlib&myncbishare=rivm

Sources for reliable endpoints

Reliable endpoints can be obtained in various ways:

1. Endpoints derived from the applicant's own research;
2. Endpoints obtained on the basis of a “Letter of Access” (this applies to the CAR and Ctgb dossier);
3. Endpoints from reliable sources;
4. Endpoints derived from research contained in the publicly available literature.

1 Endpoints obtained from the applicant's own research

A reliable endpoint can be derived from the applicant's own research. However, this research must be of good quality (preferably carried out in accordance with GLP and a harmonised protocol and with the proper substance or product) and summarised and evaluated by an independent party. The quality of the evaluation by the independent party must be assured by a certified quality system (ISO 9001 or 9002) or a demonstrably equivalent system. This information about the execution of the research and the summary and evaluation must be provided together with the application for each endpoint derived from the applicant's own research.

2 Endpoints based on a “Letter of Access”

There are already substance dossiers available at the European level. The most important source of reliable endpoints is the Assessment Report or Competent Authority Report (CAR) or summary dossier associated with the inclusion of an active substance in the Union list of approved substances of EU Regulation 528/2012.
All active substances in notified biocidal products are also evaluated within the framework of the inclusion of these substances in the Union list of approved substances of EU Regulation 528/2012.
An Assessment Report or CAR is or will therefore be available for all such substances. The Assessment Report or the CAR includes a List of Endpoints, containing reliable endpoints, for all relevant substance information which must be provided with the application.
Based on a complete summary dossier the reliable end points can be derived by the Ctgb.

Generally, the Assessment Report (and therefore also the CAR and summary dossier) consists partly of protected studies. In that case, in order to use such an Assessment Report or CAR, permission is needed from the owner of the relevant dossier. Such permission is regulated in a “Letter of Access”.

A list is available on the website of the ECHA with the owner specified per dossier: https://echa.europa.eu/information-on-chemicals/active-substance-suppliers

If a reference to the CAR or the Assessment Report for the active substance(s) is not possible, reference can also be made to a substance dossier which is already present at the Ctgb. To do so, a “Letter of Access” is also often required. Reference can be made to a substance dossier at the Ctgb only if the substance dossier was used for an evaluation of a biocidal product with a field of use which is similar to that of the notified biocidal product and if that evaluation took place after 15 May 1998. If reference is made to a substance dossier at the Ctgb, information must also be provided specifying which authorisation that substance dossier was used for and in which year the evaluation was carried out (this information must be included in the “Letter of Access”).

In the pesticides database on the Ctgb website, one can determine which active substances have been authorised for use in biocidal products in the Netherlands. Products based on these substances have been evaluated by the Ctgb. The decisions authorising these products, which can be found in the same pesticides database, also contain the authorisation evaluation. If this evaluation was carried out in 1999 or later, the assumption is that the evaluation is based on a dossier which can be used for applying for authorisation. Via the owner of the authorisation for the authorised product concerned, it is possible to determine who the owner is of the relevant information in order to obtain a “Letter of Access.” The final decision on whether a reference to such a substance dossier is sufficient is taken by the Ctgb.

3 Endpoints from reliable sources
If there is no Assessment Report or CAR and also no Ctgb dossier available for the active substance, it is still possible to use reliable public sources to complete the dossier. The sources listed below can be used to do so. These are the most logical sources for reliable endpoints, but the list presented is not exhaustive.

The sources are listed in order of reliability.

1. Endpoints derived or taken from EU evaluations/substance evaluations and evaluation processes within the framework of regulations in the area of plant protection, drugs (including animal medicines), foodstuffs or additives, existing regulations pertaining to substances, REACH etc.
   Examples: Plant protection (91/414): Technical Review Reports (monographs)
   Existing substance Regulations (793/93): Risk Assessment Reviews (choose tab card ORATS, full list).
2. Endpoints derived or taken from substance evaluation by Dutch government bodies such as: ministries, RIVM (National Institute for Public Health and the Environment), Health Council

Examples: reports by the RIVM or the Health Council

3. Endpoints derived or taken from substance evaluations by international government bodies such as WHO, FAO, OECD
   Examples: the OECD eChemportal provides a good overall access point.
4. Endpoints derived or taken from substance evaluations by government bodies from the other EU/OECD countries
   Examples: US-EPA REDs, UK PSD evaluations

5. Endpoints derived or taken from substance evaluations by authoritative national or international institutes, entities or bodies of a scientific nature
   Example: ECETOC reports, BG Chemie Toxikologische Bewertungen
6. Endpoints derived with the help of information from databases which are maintained by, and whose scientific quality is monitored by, authoritative national or international bodies
   Examples: US-EPA Ecotox database
7. Endpoints derived or taken from authoritative scientific reviews, monographs or reference works
   Examples: Verschueren Handbook of environmental data

An overview of several reliable sources can also be found in the RIVM publication: Handreiking voor de afleiding van indicatieve milieurisicogrenzen p.51-56 (Assistance for the derivation of indicative environmental risk limits)

4 Endpoints derived from research contained in the public literature
Endpoints derived from research contained in the public literature can also be used. When doing so, the applicant should realise that exact information must also be provided on which sources (databases) were used in searching for the information and how the relevant endpoint was derived from the information found. If insufficient information is provided in this regard, the Ctgb will not accept the endpoint. This means that the application will be considered incomplete and will be rejected.
General information and instructions with regard to sources and working methods can also be found in the following REACH documents:

- Information gathering
- Evaluation of available data
- Endpoint specific guidance

Waiving

Together with the application, all the information must be provided which is needed for the Ctgb to be able to prepare a risk assessment. This also means that information which is not needed for the assessment does not need to be provided. If an applicant does not provide information on the basis of scientific arguments, it is referred to as “waiving.” The scientific argument demonstrating that information does not need to be provided is also referred to as a “waiver.” If certain endpoints are not included in the dossier, then “waivers” must be provided in the dossier in support of their absence.

An applicant may deviate from the minimum requirements if arguments, for example on technical or scientific grounds, are provided demonstrating that:

- it is technically/ethically not possible to carry out the study;
- other available information can replace the information requested.

Some examples of arguments for “waiving”:

Physical and chemical properties
Explosive properties of biocides do not need to be submitted in case the biocide contains no substances classified as explosive.

Analytical methods
De analytical method for soil can be waived when there is no emission to soil using the biocide according to the instructions for use.

Human Toxicology
In the case of a gaseous biocidal product, the endpoints for dermal acute studies can be waived. The argument is that gases are absorbed poorly via the skin, and that in this case the lungs are the most important route of exposure.

If the active substance is a strong acid or base, then the endpoints for eye and skin irritation tests can be waived. The argument is that it is already clear that the substance is irritating on the basis of the pH value alone. It is then not ethical and unnecessary to also carry out tests for that purpose.

Environment
An endpoint for emission to water cannot be provided, as the substance is not stable upon contact with water. The substance can then not be measured, which makes a study in water impossible. In such a case, tests must be carried out with the relevant conversion products in water.

Chemicals exempt from substance data submission
For those chemicals that are included in the Board decision of 21 April 2005, regarding the amendment of the list with 'bulk chemicals', no substance data needs to be provided.

For the following substances, publically available datasets are accepted:

- Ethanol
- Propan-2-ol
- Salicylic acid
- Sodium dichloroisocyanurate
- Sodium dichloroisocyanurate dehydrate
- Cyanuric acid
- Sodium hypochlorite
- Calcium hypochlorite
- Peracetic acid
- Hydrogen peroxide

2.2. Aspect specific data requirements

In this paragraph the information per aspect is described.

2.2.1 Physical and chemical properties

This paragraph describes which information should be included in the dossier with regard to the identity, physical and chemical properties and analytical methods of the product. A distinction is made between the requirements for the active substance and for the product (formulation).

On the ECHA website, guidance is available on the physical and chemical properties:
https://echa.europa.eu/guidance-documents/guidance-on-biocides-legislation

If the dossier complies with these requirements, which are intended for BPR applications, the dossier is automatically acceptable for Dutch transitional legislation as well. However, it should be noted that the requirements under transitional legislation have less strict demands with regard to the data required (see below).

In general, the active substance data is addressed by submission of a List of Endpoints or a Letter of Access to the dossier of one of the notifiers for the EU review programme, as described in paragraph 2.1.

In situ substances
For substances generated *in situ*, which are formed during use of the products, the so called precursors require a List of Endpoints. For example, if chlorine dioxide is formed from sodium chlorite and hydrochloric acid, a List of Endpoints is required on all three substances.

Identity of the product
The identity of the biocidal product determines the classification, labelling and the risk assessment. The “Appendix composition” should be used for the specification of the product and should be fully filled out.

Of products that consist of two or more components, which are to be combined during use, the composition of each of these components should be described in detail.

If the final composition of a product (after completion of internal reactions) is quite different than the composition based on the formulation recipe (e.g. in the case of peracetic formed from hydrogen peroxide and acetic acid), both the recipe and the final composition should be provided.

In addition to specifying the composition, a safety data sheet (MSDS) must be provided for every co-formulant and active substance (or precursor), with the exception of, for example, water, honey and wheat flour. The trade name used in the composition statement must correspond to the name on the MSDS.

The minimum information needed for the active substance is:
1. The concentration of the active substance;
2. The ‘claimed’ concentration of the pure active substance excluding impurities and solvents (pure active substance);
3. Concentrations must always be specified in mass percentages but, in addition, may also be specified in grams per litre;
4. The minimum purity of the active substance, the specification, must be specified (minimum purity in %w/w);
5. If available, the IUPAC or CA name of the active substance must be specified. If this information is not available or if the active substance is too complex, an explanation or description is required;
6. The manufacturer of the active substance must be specified. This refers to the specific facility where production takes place and not just the supplier.

The following requirements apply to co-formulants:
1. In the first column (trade name), the trade name of the co-formulant must be specified. This name must correspond to the name on the MSDS of the manufacturer of the co-formulant;
2. If available, the co-formulant must be described in accordance with IUPAC or CA nomenclature. If this information is not available or is confidential, this information may be sent directly by the manufacturer to the Ctgb.
3. The function of the co-formulant must be specified (e.g. anti-foam, emulsifier, buffer, preservative);
4. The concentration of the co-formulant must be specified in mass percentages and, if possible, in grams per litre;
5. If the co-formulant contributes to the toxicological profile of the formulation on the basis of classification, the co-formulant should be regarded as a “substance of concern.” An explanation of what is meant by a “substance of concern” is included in the form for specifying the composition.

Finally, the manufacturer (exact location of the production facility) of the biocidal product must be specified.

Physical and chemical properties of the product
The physical and chemical properties of the product which should be specified are explained in Table 2.2.1. The shelf life of the product is very important, as an expiry date must be printed on the packaging of the biocidal product.

Table 2.2.1.: Explanation of the information requested regarding the physical and chemical properties of the product

Application form reference	Required information	Explanation
3.1	Appearance, odour and colour	The odour must be specified only if determination of the odour does not pose a risk to the analyst.
3.2, 3.3	Explosive and oxidising characteristics	If none of the components in the product are classified as explosive or oxidising, it is sufficient to provide a (waiver) statement. A test is only required if the product contains components classified as oxidising or explosive.
3.4	Flashpoint, flammability and spontaneous combustion	Flashpoint, flammability and spontaneous combustion must be determined with the help of published methods (respectively EC A9, EC A10, EC A15/16). If, based on the structure of the active substance and the properties of the components of the biocidal product, one may assume that flammability is not an issue, a statement may be submitted with arguments to that effect.
3.5	pH of a water-based biocidal product and acidity/alkalinity	The pH of a formulation can affect the classification. Alkalinity and acidity are not necessary, as they are not used for the risk assessment. The preferred method for determining the pH is CIPAC MT75. Corrosiveness to metals If no data is available on corrosiveness to metals, H290 is assigned if the pH is < 4 or > 10 and the product contains H290 classified components. At pH <2 and >11.5, H290 will automatically be assigned if no data on corrosiveness to metals is available.
3.6	Relative density	The relative density is applicable to liquids only. For solids, the bulk density can be determined. Various OECD and CIPAC methods are available for the determination of density.
3.7	Shelf-life	The shelf-life study is the most important study of the physical and chemical properties. This study should contain information about: – use of packaging material (tested material should be specified, e.g. HDPE); – the concentration of the active substance should be monitored over time; – the relevant technical properties of the product should be monitored over time (see also 3.8). A shelf-life claim is required for biocidal products. Extrapolation on the basis of accelerated studies (CIPAC MT46) is not always possible, as these have not been specifically developed for biocidal products. Accelerated studies are suitable for determining the chemical stability but not for determining the physical stability. Technical characteristics are described under 3.8. The FAO/WHO manual on pesticide specification and/or guidance on information requirements on the ECHA website contain all necessary information on what parameters should be investigated in a shelf-life study.. Other general requirements: – a study should always report which test methods were used – the study should be signed by the study director / analyst The shelf-life study is the only study that does not need to be

Application form reference	Required information	Explanation
		available upon product authorization. However, it should be confirmed the study is ongoing and when the study will be available. The study should then be submitted when available. If the above situation applies, it is required to have an accelerated storage stability data in the proposed commercial packaging (or comparable) to gain a provisional authorization.
3.8	Technical characteristics	Depending on the type of formulation, information is required about the behaviour of the biocidal product upon application. For granules, the particle size and dust content is required. The foam formation characteristics must be determined for products which are diluted with water before use. The requirements per type of formulation are described in the FAO manual, which is available on the FAO website. However, this document is intended for plant protection products. If arguments can be provided demonstrating that certain characteristics do not apply to the biocidal product, a waiver can be submitted. The ECHA guidance on information requirements is also a very useful source of information on which parameters are to be investigated per formulation type. A direct link to the FAO manual: http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/PestSpecsManual.pdf Examples: SL (soluble concentrates) formulations require foam persistence and dilution stability to be investigated. SC (suspension concentrates) formulations require suspensibility, spontaneity of dispersion, wet sieve residue, pourability and foam persistence.
3.9	Physical and chemical compatibility	If a biocidal product is to be mixed with other products or components, it must be demonstrated that the components to be mixed together are physically and chemically compatible. This can be addressed by discussing whether any (unwanted) chemical reactions may take place and whether mixing the products may cause destabilisation of the mixture causing precipitation or similar effects.
3.10	Viscosity and surface tension	These tests must be carried out on the undiluted product at 25^{o}C (surface tension) or 40^{o}C (viscosity). It is also acceptable to follow the ECHA guidance on information requirements.
3.11	Particle size distribution	For all solid preparations, the particle size should be indicated. To support the toxicological risk assessment, it is necessary to specify the fraction of particles < 50µm.

Packaging information

The packaging intended for the Dutch market must be described in great detail. This generally means that the following information must be included:

- size of the packaging (dimensions);
- capacity (volume, contents);
- material (e.g. HDPE, PP, co-extruded HDPE/polyamide, epoxy-coated metal);
- type of opening and size of opening;
- UN/ADR classification and tests for normal transport.

Packaging information can be submitted on the application form under item 9. If the packaging consists of several components, each component must be described separately.

Analytical methods
For every product a validated analytical method is required to determine the active substance and/or precursor content. Generally, methods should be validated to SANCO/3030/99 rev 4, meaning, specificity, linearity, accuracy and system precision should be addressed.

In the case of multiple active substances or precursors, methods should always be able to determine the content of the individual active substance, in the presence of each other, and the method should be specific for the individual substances.

Example: if two quaternary ammonium compounds are used together in one formulation, a titration method to determine the total quaternary ammonium compound content is not acceptable. A specific method, e.g. by LC-MS(/MS) would be required.

	Requirements
Linearity	Calibration line, based on at least 5 concentrations with single injections or at least 3 concentrations with duplicate injections. Report should include: 1. Correlation coefficient ($r > 0.99$) 2. Slope and intercept of the calibration line 3. Concentration range and number of samples
Specificity	For chromatograph methods (GC / HPLC), chromatograms showing there is no significant interference at the peak of the active substance or precursor. Report should include chromatograms of: 1. A blank formulation (without active substance) 2. The reference standard 3. The (fortified blank) formulation For titration methods, for which chromatograms cannot be provided, or other non-specific methods, it should be discussed whether any of the co-formulants could possibly cause interference.
Accuracy	Two recovery determinations at a relevant concentration (at the specification) should be performed. Standard addition is also acceptable, but preferably, a blank formulation is spiked with a known content of analyte.
Precision	System precision is addressed by injection of at least 5 samples. The standard deviation should then comply with the Horwitz criterion.

Deviation from the above is possible, if justified. This includes the use of published methods. Published methods may not always be adequately validated at a relevant concentration. Published CIPAC methods are usually considered to not require additional validation. In some cases, pharmacopoeia methods may also be acceptable. There may be more sources, but generally, these should be ring validated to ensure reproducibility.

Analytical methods for post-registration monitoring
Methods for food/feed, soil, water, air and body fluids and tissues are usually covered by the substance dossier. If not, it may be required to provide monitoring methods, depending on the exposure route(s) of the product.

2.2.2 Efficacy

When applying for the authorisation of a notified biocidal product, complete studies must be provided regarding the efficacy of the biocidal product. Efficacy is defined as the ability of a product to fulfil the label claims for it on the proposed product label: Is the product actually sufficiently effective against the claimed organisms under the conditions specified? The applicant must provide sufficient information (in the WG/GA and the PGB-PUB) to clearly specify the field of use of the product. In addition, studies must be provided which demonstrate that the product, when used in accordance with the WG/GA, is sufficiently effective.

For efficacy, only product information is required and not information about the active substance itself. The TL application form asks for various data to be able to assess the efficacy.

Item 5.8 on the application form (appendix B) asks for information about the mode of action of the product. This information should be submitted in a separate document (titled 'mode of action'). In some cases, the answer can be very brief, e.g.: *"The product is an oxidant."* In other cases, the mechanism of operation needs to be described in detail, e.g.: *"The active substance binds via electrostatic linkages to charged locations on the bacterial cell wall, thereby weakening the cell wall and allowing the active substance to penetrate the cell wall and damage DNA, RNA and enzymes inside."* It is possible that a mechanism of operation is not yet fully understood, in which case the applicant must describe the mechanism of operation as fully as possible in accordance with the information currently available.

2.2.2.1 Efficacy tests

Item 5.10.2 on the application form asks for efficacy studies. The applicant must submit studies which clearly demonstrate the efficacy of the product. Note: the quality of the studies is important here and not the number of studies!

The requirements for the efficacy studies under the Transitional Legislation are identical to those under the BPR. The guidance for efficacy evaluation is described in the EU part of the Evaluation Manual.

To accommodate the evaluation by the CA and speed up the process a **summary of the efficacy data** should be provided as part of the dossier.

2.2.2.2 Restrictions

Item 5.11 on the application form asks for information on limitations and restrictions to the use of the product. This information should be submitted in a separate document (titled 'restrictions including resistance').This can be divided into the following:

- use-related restrictions;
- restrictions to use in combination with other products;
- development of resistance and cross-resistance, and resistance management strategies.

"Use-related restrictions" refers to the information which must be included in the WG/GA to ensure adequate efficacy of the product (e.g. proper maintenance of equipment, do not use in the rain etc.) and to prevent any undesired side effects from the use of the product. Examples include the effect of wood preservative products on fastenings and fittings or disinfecting products which can cause damage to instruments or equipment. Other unacceptable effects may occur if the product is used in combination with other products. If the product tested causes any of the above-mentioned side effects, it may lead to restrictive clauses in the WG/GA (e.g. do not use on stainless steel, may not be used in combination with…).

Although the development of resistance is an important topic, for most PTs not much is known about this topic in practice. For disinfectants, the Dutch Health Council has published an advisory report 'Resistance due to use of disinfectants'. For rodenticides and insecticides information can be found on the websites of RRAC, RRAG, IRAC and the IRAC database. Some guidance has been provided, please see the EU part of the Evaluation Manual.
It is sometimes possible to deduce the possible development of resistance from the lifecycle and/or behaviour of some organisms. In other cases, it is possible to deduce whether resistance can easily develop or not from the mode of action. If a product works on the basis of a single enzyme, resistance can develop quickly when the organism can easily bypass that enzyme. A mode of action which is broader (e.g. oxidation) or which targets a very critical process is often more difficult to bypass, which means that resistance will not be expected to develop too quickly. Also, if a product has been in use for 10 years and the development of resistance has never been reported, it can also be taken as an indication.
The applicant is requested to provide as much relevant information as possible about the possible or actual development of resistance to the product. If resistance is expected to develop, the applicant must propose a resistance management protocol and include this in the WG/GA.
For some insecticides, resistance management protocols have been set down, e.g.: "*May be used against flies a maximum of 5 times per year with a minimum of 28 days between treatments, and the use of the product must be alternated with the use of other products with a different mode of action.*"
Resistance development and resistance management has the full attention of the Ctgb. Please follow the postings on the our website.

2.2.3 Human health

In order to be eligible for acceptance (authorisation), reliable endpoints must be submitted (see paragraph 2.1) for each active substance as well as for the product itself. The information to be supplied is divided into "minimum information" - i.e. endpoints which apply to every product group (common core data) - and "additional information" - i.e. endpoints which must be provided in certain situations (depending upon various factors including the specific use, the expected exposure etc.).

Required information on toxicity of the active substance
Depending upon the PGB-PUB, the dossier must include reliable endpoints with regard to the following aspects:

- Metabolism in mammals: absorption, distribution in the body and excretion;
- Acute toxicity
    - Oral (oral exposure)
    - Dermal (dermal exposure)
    - Inhalation (inhalation exposure)
    - Irritation of skin and/or eyes
    - Hypersensitivity of the skin (allergic reactions)
- Subchronic oral toxicity (if inhalation/dermal toxicity is more relevant in view of the exposure, then subchronic inhalation/dermal toxicity should be provided as an endpoint);
- Genotoxicity (effects on genetic material);
- Reprotoxicity (effects on offspring);
- Neurotoxicity (effects on the nervous system);
- Carcinogenicity (potential to cause cancer).

For more information, see appendix 1A.

For a few product groups, specific information is required, which is generally related to the exposure to possible reaction products (e.g. exposure to chlorine when swimming) and the

consumption of residues probably present in food/drinking water. If additional detailed information is needed, the Ctgb will request applicants to provide additional information. For more information, see appendix 1A.

Required information on product toxicity
The dossier must include reliable endpoints with regard to the product for the following aspects:
Acute toxicity:
- Oral (oral exposure);
- Dermal (dermal exposure);
- Inhalation (inhalation exposure);
- irritation of skin and/or eyes;
- Hypersensitivity of the skin (allergic reactions).

For more information, see appendix 1B.

2.2.4 Environment
In the table in appendix 2A, a symbol indicates which questions on the application form must be answered with endpoints for the environmental aspect. Standard endpoints (Basic data requirements ●) must always be submitted. Additional data requirements (◊) apply to endpoints which do not have to be submitted as a matter of standard procedure but depend upon the application, as explained in a note. The minimum dossier requirements are categorised in the table per emission path or per group of organisms exposed. The explanatory notes for the table are divided into “fate and behaviour” and “effects on organisms.” if a product contains more than one active substance, the minimum dossier requirements must be submitted for all the active substances. This can sometimes be complied with by providing endpoints which come from studies on the product itself (instead of the active substance(s)).

In order to ensure that the evaluation process proceeds as quickly and effectively as possible, it is very important for the applicant, before submitting an application for authorisation, to make an assessment of whether the intended use results in emission to an environmental compartment and a potential risk for the environment. In the latter case, it may be possible, by providing extra information which allows a more detailed risk assessment to be made, to already decide in the first stage of the evaluation that the risk is acceptable. The possible extra information is described in the table in appendix 2B.

Emission Scenarios are used to determine the size of emissions into the environment of the active substances and their degradation products. The most important aspect of emission scenarios are the input parameters. In many cases, it is sufficient to provide information on the quantity of product used and the concentration of the active substance in the product. In addition, information on the frequency of use and the period of use is often entered into the emission scenario.

For some types of products (PT 1, 2, 4, 7 and 9), information is needed on the total use (tonnage) of the product in the Netherlands, divided into total use and specific use as a biocidal product. In this regard, it is also relevant to provide background information on tonnage figures, for example the variation in use over time in recent years. For some uses and scenarios, the product requirements are described in a separate document: “Information required for ESD calculation.” This document can be found together with the TL application form at www.ctgb.nl.

An estimate must also be made of the leaching rate for the following product groups:
- PT07 (Film preservatives);
- PT08 (Wood preservatives);

- PT09 (Fibre, leather, rubber and polymerised materials preservatives);
- PT10 (Masonry preservatives);
- PT21 (Antifouling products);
- and, where relevant, for PT14 (Rodenticides), PT18 (Insecticides), PT19 (attractants).

In some cases, leaching rates can be estimated on the basis of the quantity of active substance in the product and a realistic "worst-case assumption" for the emission.

The Ctgb accepts only those applications which are administratively as well as scientifically complete. An application is administratively complete if the application form has been completely filled in and is accompanied by all the required appendices. An application is scientifically complete if the application and the accompanying information are of sufficient quality to allow the risk assessment to be carried out.

The Ctgb first evaluates the application and the dossier via an intake process. If the application is judged to be complete, then the dossier moves into the stage of risk assessment, and the Ctgb takes a decision on authorising the product. The applicant is notified only after the decision has been taken.

If the application is not complete, the Ctgb will contact the applicant and will request for additional information / studies. The applicant has the opportunity to provide this information which will be evaluated by the Ctgb to finalise the evaluation. If an application will be rejected the application will not be eligible for authorisation. As a result, the biocidal product may not be marketed or used in the Netherlands. The Ctgb will inform the applicant accordingly.

The Ctgb evaluates whether the product should be authorised for the Dutch market. On the basis of the risk assessment, the Ctgb answers the following important questions:

Is the identity of the product and the active substances clear? The information provided with regard to identity of the product and the active substances must be sufficient and clear.

Is the product sufficiently effective? The information provided with regard to efficacy must demonstrate that the product is effective against the organisms specified under the conditions specified.

Does the use of the product result in unacceptable risks for humans, animals and the environment? In paragraph 2.3, an explanation is given of how the risk assessment is carried out. First the risk assessment for humans is explained and then the risk assessment for the environment.

2.3. Risk assessment

2.3.1 Human health risk assessment

The goal of the risk assessment for humans is to determine whether the use of a biocidal product has any adverse effects for the persons working with it (professional or non-professional) or for the general population. To do so, the limit values, derived from endpoints as described in paragraph 2.1, are compared with the expected exposure.

The limit values derived from the information provided will be used for the risk assessment. The limit values are derived from the most critical toxicological endpoints (lowest NOAEL[1]), with the inclusion of safety factors. The limit values, such as AEL/C (Acceptable Exposure Level/concentration), are compared to the expected exposure.

[1] NOAEL stands for No Observed Adverse Effect Level.

The exposure of the worker is preferably evaluated on the basis of exposure studies. The first approach taken if such studies are not available is to prepare an initial estimate of exposure with the help of validated models on the basis of the exposure scenarios associated with the application for authorisation.

The assessment of the risk takes place via a step-by-step approach using methods described in paragraph 4.4 of the EU-part of the BPR evaluation manual. The first step is based on a "worst-case situation" with respect to the estimate of exposure. If the exposure is lower than the limit value, then a product can be authorised under the proposed conditions.

If the criteria in the first step are not complied with (i.e. exposure is higher than the limit value), then a product cannot be authorised under the proposed conditions. A more detailed risk assessment can then be carried out, in which modified safety factors and risk mitigation measures such as personal protective equipment are taken into account.
If the criteria are also not complied with in this situation, then the decision must be taken not to authorise the product. After all, it is not possible to guarantee the safe use of the product.

2.3.2 Environmental risk assessment

The use determines the emission into the environment during the lifetime of a biocidal product. Three phases can be distinguished in this regard:

1) the application phase (applying the product);
2) the use phase (the phase during which the biocidal product "does its work"); this phase sometimes coincides with the application phase;
3) the waste phase (used product, used treated material and remains).

All these phases must be taken into account in the risk assessment. The starting point for an environmental risk assessment is therefore a good description of the field of use and the manner of use, together with information on the dosages used, concentrations, frequency of application and period of use.

The PGB-PUB and WG/GA determine which uses and emission routes will be considered in the evaluation and for which cases a determination must be made on whether safe use is possible. The information provided with regard to the use and the environmental characteristics of the active substance(s) must be sufficient to:

- be able to predict the distribution, fate and behaviour of the biocidal product in the environment, with an estimate of the concentration in the relevant compartments (soil and groundwater, wastewater treatment plants (STP), surface water, air).
- be able to predict the effect on relevant non-target organisms (aquatic organisms, soil organisms, birds/mammals and non-target invertebrates); endpoints from studies with these organisms are used to formulate environmental standards for the relevant compartments.
- be able to predict what the risk is for non-target organisms by comparing the concentrations in the relevant compartments (soil, wastewater treatment plants, surface water and air) with the standards;
- identify which measures are needed to limit emissions to the environment and thereby prevent contamination of the environment and effects on non-target species.

On the basis of the use, the emission scenarios and the characteristics of the active substance, the Predicted Environmental Concentration (PEC) is calculated for the primary compartments: wastewater treatment plants, water/sediment, soil and air. Then the PEC is compared to the standard, the Predicted No Effect Concentration (PNEC). If the PEC is less than the PNEC, then the risk is acceptable and use of the product is assumed to be safe.

The minimum information may be sufficient to demonstrate a safe use, in particular for small-scale applications without a direct emission to surface water and/or soil. If, on the basis of the information provided, the PEC is higher than the PNEC, then a risk is identified, and a following step is required. In that case, the Ctgb will request the applicant to limit the use of the product. This may mean that authorisation is not possible.

3. APPROVAL

The risk assessment may lead to the conclusion that the biocidal product, within the framework of the intended field of use, results in unacceptable effects on humans and the environment. The conclusion in that case is that the biocidal product concerned cannot be authorised. However, in many cases, measures are conceivable which will limit the identified risks to an acceptable level. For example, the intended field of use may be limited or the use of personal protective equipment may be required. Via these limitations on use, the product can then still be used safely. The Ctgb is authorised to impose limitations on use on the basis of the risk assessment. The Ctgb communicates with the applicant in this regard.

The actual decision whether a biocide can be authorised follows from the aspect specific assessments according to NL transitional legislation (TL) under Wgb 2007 (2011); art. 49 and Bgb and Rgb .

After completing the risk assessment, the Ctgb takes a decision on whether to authorise the biocidal product. The decision is based on the scientific evaluation of the biocidal product. In a very few cases, policy arguments also play a role in the decision on authorising a biocidal product. Economic motives never play a role.

The Ctgb can take various decisions with regard to authorisation:

- A decision to authorise the biocidal product;
- A decision to reject the application;
- A decision to request additional information (this is not a formal decision).

Decision to authorise

Decisions to authorise a product are published in the *Staatscourant* (Dutch Government Gazette). Authorised biocidal products are entered into the Pesticides Database which can be found on the Ctgb website.

The decision to authorise a biocidal product determines the following: the name of the biocidal product which has been authorised, the authorisation number, the concentrations of the active substances in the biocidal product, the Legal Use Instructions and the Directions for Use (WG/GA), the hazard indications, warning statements and safety recommendations, and the shelf-life in the original packaging. In addition, an expiry date is determined for the authorisation of the biocidal product. To extend the authorisation after the expiry date, an application for extension of the authorisation must be submitted to the Ctgb in a timely fashion. The Ctgb will inform the authorisation holder accordingly in a timely fashion.

Decision to reject

A decision to reject the application is not published. However, if such a decision is taken, the applicant receives a detailed motivation with the reasons why the application was rejected.

Decision to request additional information

A decision to request additional information is not published. The applicant receives a detailed motivation of the decision and is given a certain period of time within which the additional information must be provided.
After this information has been provided, a new risk assessment is prepared and a definitive decision is taken regarding the application.

Opinions procedure

For decisions on the authorisation of biocidal products based on substances which have not previously been authorised in biocidal products in the Netherlands, a special open “opinions

procedure" is organised. The decision will be available for inspection at the Ctgb for a period of two weeks. This will also be made known in the *Staatscourant*. During this period, interested parties can indicate in writing that they wish to submit an opinion. The decision is published as quickly as possible in the *Staatscourant*. If an opinion is submitted in a timely fashion, the Ctgb will decide on the application within a reasonable period of time, taking the opinion submitted into account. The applicant of the biocidal product that has been evaluated will be informed in writing of the period of time needed by the Ctgb to reach a decision.

The Wgb (Plant protection products and biocides Act) 2007 stipulates in Art. 49 (1) (b3 and b4): "a biocide may only be authorised where this has no unacceptable effect on men and animal, directly or via residues".

The evaluation of products on the basis of existing active substances already included in Annex I or new substances has been laid down in the Plant Protection Products and Biocides Regulations (Rgb) where it is elaborated that these products are evaluated according to the national specific criteria.

Another provision is that a biocide will only be authorised or registered where the following is adequately taken into account:

a. all conditions under which the biocide is normally used,
b. the manner in which the biocide-treated material can be used, and
c. the consequences of the use and removal of the biocide.

4. DEVELOPMENTS TL FRAMEWORK

Biocides dossiers are currently being evaluated in EU framework and product authorisations are currently assed in the EU and NL. This process will also result in new or amendments of the already existing guidances, agreements, recommendations, test guidelines etc.

Developments within the EU/NL framework will also affect the data requirements and testing framework with criteria and trigger values (e.g. derivation endpoints and limit values and Substance of concern approach) in TL framework because the largest possible harmonisation of data requirements and testing framework for criteria and trigger values is aimed for.

After agreement by the Ctgb new or amended EU-developed methods will be implemented and used for aspect specific assessments in the TL framework taking into account national specific elements.

5. APPENDICES

Appendix 1A: Required information on toxicity of active substances

Acute Toxicity

For acute oral, dermal and inhalation studies, substances other than gases shall be administered via at least two routes, one of which should be the oral route. The choice of the second route will depend upon the nature of the substance and the likely route of human exposure. Gases and volatile liquids should be administered by the inhalation route.
The acute toxicity tests provide an indication of the possible adverse effects of the active substance. Administration via different routes makes an overall assessment possible of relatively acute hazards of exposure in different exposure routes. Furthermore, acute toxicity testing serves as an initial step in planning dosage levels for subsequent testing.
Acute toxicity testing may provide valuable information for accidental situations.

Oral

For substances with low acute oral toxicity, a limit test using 2000 mg/kg body weight may be sufficient. However, a need to testing higher doses could be determined on a case-by-case basis. When planning new tests, the EC methods B.1.bis, B.1.tris (or the corresponding OECD guidelines 420 and 423) and OECD guideline 425 are recommended.
EC method B.1 (or the corresponding OECD guideline 401) should not be used.
Existing results based on EC method B.1 (or OECD method 401) are acceptable.

Dermal

Dermal toxicity must be reported in an active substance except for gases.
For substances with low acute dermal toxicity, a limit test using 2000 mg/kg body weight may be sufficient. Use EC method B.3 or the corresponding OECD guideline 402.

Inhalation

Inhalation toxicity must be reported where the active substance is:

- a volatile substance (vapour pressure > 1 x 10-2 Pa at 20°C),
- a powder containing a significant proportion (e.g. >1% on a weight basis) of particles with particle size MMAD <50 micrometres or to be included in preparations which are powders or are to be applied in a manner which generates aerosols, particles or droplets in the inhalable size range (MMAD < 50 micrometres).

Substances classified as corrosive on skin must not be studied.
The full study using three dose levels may not be necessary if a substance at an exposure concentration to the limit concentrations of the test guideline (limit test) or at the maximum attainable concentration produces no compound-related mortalities.
Use EC method B.2. or the corresponding OECD guideline 403.

Skin and eye irritation

The tests will provide information on the degree and nature of skin, eye and associated mucous membrane irritation, especially with regard to the reversibility of responses.
These tests need not be carried out if the active substance is a strong acid or base (pH below 2 or above 11.5) and where the active substance has shown to have potential corrosive properties, or is a severe skin irritant, eye irritation test shall not be necessary.
It may be possible to accept positive findings from *in vitro* test methods which are close to validation by recognised organisations EC methods B.4 (skin irritation) and B.5 (eye irritation) or the corresponding OECD guidelines 404 and 405.

Skin sensitisation

The test will provide sufficient information to assess the potential of the active substance to cause skin sensitisation reactions.

While the guinea-pig Maximisation test is considered to be the preferred adjuvant technique in certain cases, there may be good reasons for choosing the Buehler test or the Local Lymph Node Assay (LLNA). However, scientific justification may be given when either of the two latter mentioned is used. The test is not needed if the active substance is classified as a sensitiser according to Directive 67/548/EEC or is otherwise known to be a sensitiser (e.g. see human data in paragraph A6.12.6). Use EC method B.6 or the corresponding OECD guideline 406.

Metabolism studies in mammals
The test(s) should provide basic data about the rate and extent of absorption, the tissue distribution and the relevant metabolic pathway including the degree of metabolism, the routes and rate of excretion and the relevant metabolites.
Usually a single application test with two different doses (low and high doses) and a repeated dose toxicokinetic study in one appropriate species, usually rats, by the oral route is required.

Subchronic oral toxicity test
Usually rats are the preferred rodent species and dogs are the preferred non-rodent species. If there is evidence from the 90-day studies that dogs are significantly more sensitive and where such data is likely to be useful in extrapolating results to humans, in addition to the 90-day study a 12-month toxicity study in dogs may need to be conducted and reported. It is possible to replace a 90-day study in dogs with a one-year study in dogs. An expert judgement is required to determine whether the one-year test is needed (see Chapter 1.2, point 4). Use EC methods B.26 (90-day repeated oral dose study using rodent species) and B.27 (90-day repeated oral dose study using non-rodent species) or the corresponding OECD guidelines 408 or 409.

A percutaneous study may be necessary where it is justified that dermal route is more appropriate or specific effects of concern are different from the effects seen in the studies in other routes. Use EC method B.28 or the corresponding OECD guideline 411.

For volatile substances (vapour pressure >1x 10-2 Pa) or in cases where the potential inhalation exposure is significant, an inhalation study is required instead of an oral study. In some cases (e.g. aerosols and dusts/particulate matter), studies by the inhalation route should be required in addition to studies by the oral route. Use EC method B.29 or the corresponding OECD guideline 413.

A combined long-term carcinogenic toxicity study in rats in cases of non-reversibility or a carcinogenic potential is demonstrated in the 90-day study.

Genotoxicity studies
The testing of genotoxicity is a screening programme to identify substances which might cause permanent transmissible changes in the amount or structure of a single gene or gene segments, a block of genes or chromosomes. Genotoxicity studies may provide pre-screening information on the genotoxic carcinogenic potential of a substance.
At least one *in vitro* test for gene mutations, one test for clastogenicity in mammalian cells and one test for gene mutation in mammalian cells are required.

Additional tests, which may become necessary upon positive results of the initial screening tests or for other reasons should be selected on a case-by-case basis taking into consideration genetic endpoints, mechanistic aspects, cell-specific aspects, physico-chemical, toxicokinetic and toxicodynamic properties and relevant information on the chemical analogues of the substance. An expert judgement is required to decide on additional studies (see Chapter 1.2, point 4). Use EC methods B.10-B25 or the corresponding on OECD guidelines 471-485.

I. In vitro gene mutation study in bacteria
E.g. EC method B.14 (Salmonella typhimurium-reverse mutation assay) or the corresponding OECD guideline 471.

II. In vitro cytogenicity study in mammalian cells
E.g. EC method B.10 (*In vitro* mammalian cytogenetic test) or the corresponding OECD guideline 473.

III. In vitro gene mutation assay in mammalian cells
E.g. EC method B.17 (*In vitro* mammalian cell gene mutation test) or the corresponding OECD guideline 476.

IV. In vivo genotoxicity study
If *in vitro* genotoxicity studies are positive, then an *in vivo* genotoxicity study will be required (bone marrow assay for chromosomal damage or a micronucleus test). EC methods B.11 (*In vivo* mammalian bone-marrow cytogenetic test, chromosomal analysis), B.12 (Micronucleus test) or the corresponding OECD guidelines 474, 475 are the preferred testing methods. Tests performed accordingly EC methods B.24 (Mouse spot test) or the corresponding OECD guideline 484, B.39 (*in vivo* UDS assay) or the corresponding OECD guideline 486 and other tests may give supplementary information on genotoxicity.

V. If in vivo studies are negative but some of the in vitro tests are positive then undertake a second *in vivo* study to examine whether mutagenicity or evidence of DNA damage can be demonstrated in tissue other than bone marrow.

If in vivo studies are positive then a test to assess possible germ cell effects may be required. EC method B 22 (Rodent dominant lethal test) and B23 (*In vivo* mammalian germ cell cytogenetics) or the corresponding OECD guidelines 478 and 483.

<u>Reproductive toxicity</u>
These tests provide information on adverse effects on male and female fertility and embryonic and foetal development including possible adverse effects on the offspring during lactation and on the maternal animals. The tests will give additional information on any enhancement of general toxic effects on pregnant animals.
If, in exceptional circumstances, it is claimed that such testing is unnecessary, this claim must be fully justified.

I. Teratogenicity test
The tests should normally be performed in rabbits and one rodent species.
In the event that one study is performed, the preferred species is rabbit.
For substances with low toxicity, a limit test with 1000 mg/kg body weight may be sufficient.
While the standard reference point for treatment responses are concurrent control data, historical control data may be helpful in the interpretation of the particular teratogenicity studies.

The historical control data provided must include the same principles as reported. A computerised database as reference for these data may be useful. A glossary or detailed description of terminology and diagnostic principles for malformations and variations must be given in the report. Use EC method B.31 or the corresponding OECD guideline 414.

II. Two-generations reproduction study
This should be conducted using two generations, in one species (rats). The investigation should be performed carefully both with male and female animals. Use EC method B.35 or the corresponding OECD guideline 416.

Neurotoxicity study
This data may be relevant on the basis of the toxicological properties of a substance. Neurotoxicity studies detect functional changes and/or structural and biochemical changes in the central and peripheral nervous systems. These changes can be morphological, physiological (e.g. electroencephalographic changes), or behavioural in their nature, or can be changes in biochemical parameters (e.g. neurotransmitter levels). If there are any indications that the active substance may have neurotoxic properties then specific neurotoxicity studies are required. Indications of neurotoxicity can be acquired from the standard systemic toxicity studies. Further investigation is possible using standard repeated dose toxicity tests with incorporation of specific neurotoxicity measures, like sensory activity, grip strength, and motor activity assessment (e.g. EC method B7 or the corresponding OECD guideline 407) and/or acute neurotoxicity testing using the OECD method 424. Expert judgement is required to decide whether a repeated dose neurotoxicity study is needed (see Chapter 1.2, point 4). These studies have to be performed for substances of similar or related structures to those capable of inducing delayed neurotoxicity. If anticholinesterase activity is detected, a test for response to reactivating agent may be required.
Use EC methods number B.37 (Delayed neurotoxicity of organophosphorus substances following acute exposure) and B.38 (Delayed neurotoxicity of organophosphorus substances, 28 repeated dose study) or the corresponding OECD guidelines 418 and 419.

Additional data active substance
In situations as mentioned below, additional data might be necessary:

- Toxicity of degradation products, by-products and reaction products related to human exposure. Information is required on the toxic effects of substances generated from an active substance, other than mammalian metabolites, in the normal use of a biocidal product. Where human exposure is significant, toxicity testing may be needed. This data may be relevant for many product types. As examples, product types 1 and 2 (reaction products with water when the substance is used for human hygiene purposes). The decision as to the need for this data should be made on a case-by-case basis by expert judgement.
- If residues of the biocidal product remain on feedingstuffs for a significant period of time, then feeding and metabolism studies in livestock will be required to permit evaluation of residues in food of animal origin. The decision as to the need for this data should be made on a case-by-case basis by expert judgement.

Appendix 1B: Required information on toxicity of product

In general, testing on the product/mixture does not need to be conducted if: there are valid data available on each of the components in the mixture to allow classification of the mixture

according to the rules laid down in Regulation (EC) No 1272/2008 (CLP), and synergistic effects between any of the components are not expected

Acute toxicity
Biocidal products other than gases shall be administered via at least two routes, one of which should be the oral route. The choice of the second route will depend upon the nature of the product and the likely route of human exposure. Gases and volatile liquids should be administered by the inhalation route.
In some cases it may be necessary to study acute toxicity in all three routes.
The acute toxicity tests are to provide an indication of possible adverse effects of the toxicity of the biocidal product. Administration via different routes makes an overall assessment possible of the relative hazard of different exposure pathways. Acute toxicity testing may provide valuable information for accidental situations.

Oral
For preparations with low acute oral toxicity, a limit test at 2000 mg/kg body weight may be sufficient.
When planning new tests, the EC methods B.1.bis, B.1.tris (or the corresponding OECD TGs 420 and 423) and the OECD TG 425 are recommended). EC method B.1 (or OECD TG 401) should not be used. Existing results based on EC method B.1 (or OECD TG 401) are acceptable.

Dermal
Dermal toxicity must be reported except for gases.
For preparations with low acute dermal toxicity, a limit test at 2000 mg/kg body weight may be sufficient. Preparations which are classified as corrosive must not be studied.
Use EC method B.3 or the corresponding OECD guideline 402.

Inhalation
Inhalation toxicity must be reported, if the preparation is

- volatile (vapour pressure > 1 x 10-2 Pa at 20°C), or
- a powder containing a significant portion (e.g. > 1% on a weight basis) of particles with particle size MMAD < 50 micrometres, or
- to be applied in a manner which generates aerosols, particles, or droplets in an inhalable size range (MMAD < 50 micrometres).

Preparations classified as corrosive must not be studied.
A full study using three dose levels may not be necessary if a preparation at an exposure concentration to the limit concentrations of the test guideline (limit test) or at the maximum attainable concentration produces no compound-related mortalities.
Use EC method B.2 or the corresponding OECD guideline 403.

Skin and eye irritation
The tests will provide information on degree and nature of skin, eye and associated mucous membrane irritation, especially with regard to reversibility of responses.
If the active substance is a strong acid or base (pH value below 2 or above 11.5), the test does not need to be carried out.
It may be possible to accept positive findings from *in vitro* test methods which are close to validation by recognised organisations.
If the materials have been shown to have potential corrosive or severe irritant properties, the test should not be carried out.
If the formulation of the product gives reasons to believe and accept that the product should be classified and labelled as an irritant, then the tests not may be carried out.
Use EC methods B.4 (dermal irritation) and B.5 (eye irritation) or the corresponding OECD guidelines 404 and 405.

Skin sensitisation
The test will provide information to assess the potential of the product to cause a skin sensitisation reaction.
This is not needed where the preparation contains a substance or substances which is/are classified as a sensitiser(s) according to Directive 67/548/EC or is/are otherwise known be a sensitiser/sensitisers, e.g. on the basis of epidemiological data.
While the guinea pig Maximisation test is considered to be the preferred adjuvant technique in certain cases there may be good reasons for choosing the Buehler test or the Local Lymph Node Assay (LLNA). However, scientific justification may be given if either of the two latter mentioned is used.
Use EC method B.6 or the corresponding OECD guideline 406, for example.

Additional data
In a situation as mentioned below, additional data may be necessary:

Dermal absorption
For determining the dermal absorption, the “EU guidance document on dermal absorption” (EFSA Journal 2012;10(4):2665) should be used as a guideline. A default value for dermal absorption of 75% is used as a starting point unless a default value of 10% is more appropriate based on physical and chemical properties. In special cases (when dermal exposure is the main route of exposure and a risk as a result of dermal exposure is identified) endpoints based on *in vitro* and/or *in vivo* dermal absorption studies can be used to refine the risk assessment. These dermal absorption studies should be carried out in accordance with OECD guidelines 427 and 428 and the “EU guidance document on dermal absorption”. The concentrations of the test substance should be of the order of magnitude of the estimated human exposure. If for dermal absorption the value as included in the CAR (based on study information) is used, information needs to be submitted which shows that the product is comparable to the tested product in the CAR. For this the “EU guidance document on dermal absorption” can be used.

The working group on Human Health (BPC WG HH) adopted the document “Dermal absorption of PT21 active substances” in November 2016. The publication date on the ECHA website was 9-12-2016 and Ctgb implemented the document from 9-12-2016.
The document on dermal absorption PT21 describes the practical ways forward in performing and interpreting dermal absorption studies on antifouling products.
At the moment the protocols as given in OECD guidelines 427 (*in vivo*) and 428 (*in vitro*), supported by OECD Guidance Document No. 28 for the conduct of skin absorption studies, are considered appropriate. Furthermore, the general principles as indicated in e.g. ECHA Guidance Vol III Part A: Information requirements and EFSA Guidance on dermal absorption (2012) are followed. However, some of the recommended procedures or general principles are difficult to apply to film-forming antifouling paints. In this document the practical ways forward in performing and interpreting dermal absorption studies on antifouling products, not supported by the protocols and the general principles as indicated are recommended.

Disinfection by-products
DBPs at present will not be part of the product authorisation of DBP forming active substances (e.g. reactive chlorinated/brominated substances, peroxides etc.).

In January 2017 the final guidance on Disinfection By-Products was made available on the ECHA website. This document summarises background information and provides a strategy for the human health risk assessment of DBPs. This document provides a scientific and pragmatic strategy for the risk assessment of disinfection by-products (DBPs) in the context of authorisation of halogenated biocidal products in swimming-pool water under European legislation.

The risk assessment is based on a set of known marker DBPs, using consensus health-based limit values and published, modelled or measured DBP concentrations under described conditions.
Measurements of concentrations of DBPs after biocide use in swimming-pools are needed to perform the risk assessment. Relevant concentration data may be gathered from available literature. Where needed actual measurements should be performed. Simulation studies or modelling can be used to derive realistic worst case formation levels.

It is recommended that industry parties coordinate activities to refine the risk assessment.

The present guidance focuses on PT2 in swimming-pool water for which human exposure was considered most relevant while discussing the exposures to DBPs (PT2 swimming water, PT11/12). Other PTs for which a DBP-assessment may be needed are PT1, PT4 and PT5, followed by PT3, PT11 and PT12. It is recommended to further investigate the applicability of the present guidance to these PTs.

The guidance should be used by EU member states (CAs and applicants) from January 2019.

Ctgb will inform the applicant that in case there are no concentration data gathered from available literature available actual measurements or simulation data or modelling approaches should be made available by the applicant to be used in the assessments for product authorisations over 2 years. From January 2019 the data for PT2 (swimming water) and the risk assessment based on these data are compulsory. Moreover, the applicants are asked to further investigate the applicability of the present guidance to other human exposure scenarios in PT2 and other PTs and submit data.

Appendix 2A: Endpoints for environmental section

Minimal file requirements[1,2] depending on the type of application

Test code	Data requirements	Environmental compartment or group of organisms exposed					
		Sewage treatment plant	Surface water*	Salt water*	Soil **	Air	Birds and mammals
	Fate and behaviour						
7.1.1.1.1	*Hydrolysis as a function of pH and identification of breakdown products*	●	●	●	●		
7.1.1.1.2	*Phototransformation in water including identity of the products of transformation*	●	●	●	●		
7.1.1.2.1 7.1.1.2.2	*Ready biodegradability* *Inherent biodegradability, where appropriate*	● ◊(2)	● ◊ (2)	● ◊(2)	● ◊(2)		
7.1.1.2.3	*Biodegradation in seawater*			◊ (3)			
7.1.2.1.2	*Anaerobic biodegradation*				◊ (4)		
7.1.3	*Adsorption/desorption screening test*	●	●	●	●	●	
7.2.3.1	*Adsorption and desorption in accordance with the new test guideline EC C18 or the corresponding OECD 106 and, where relevant, adsorption and desorption of metabolites and degradation products*				◊(5)		
7.3.1	*Phototransformation in air (estimation method), including identification of breakdown products*					◊(6)	
	Effects on organisms						
7.4.1.1	*Acute toxicity to fish*	●	●	● ◊(7)	●		
7.4.1.2	*Acute toxicity to invertebrates*	●	●	● ◊(7)	●		
7.4.1.3	*Growth inhibition test on algae*	●	●	● ◊(7)	●		
7.4.1.4	*Inhibition to microbiological activity **(STP)***	●	◊(8)	◊(8)	◊(8)		
7.4.2	*Bioconcentration****	●	●	●	●		●
7.4.3.2	*Effects on reproduction and growth rate on an appropriate species of fish*	◊(9)	◊(9)	◊(7)			
7.4.3.3.1	*Bioaccumulation in an appropriate species of fish*	◊(10)	◊(10)	◊(10)			
7.4.3.3.2	*Bioaccumulation in an appropriate invertebrate species*			◊(10a)			
7.4.3.4	*Effects on reproduction and growth rate with an appropriate invertebrate species*	◊(9)	◊(9)	◊(7)			
7.4.3.5.1	*Effects on sediment dwelling organisms*	◊(11)	◊(11)	◊(7)			
7.4.3.5.2	*Aquatic plant toxicity*			◊(7)			

Test code	Data requirements	Environmental compartment or group of organisms exposed					
		Sewage treatment plant	Surface water*	Salt water*	Soil **	Air	Birds and mammals
7.5.1.1	*Inhibition to microbiological activity **(terrestrial)***				◊(12)		
7.5.1.2	*Acute toxicity test to earthworms or other soil non-target organisms*				◊(12)		
7.5.1.3	*Acute toxicity to plants*				◊(12)		
7.5.3.1.1	*Acute oral toxicity **to birds***						◊(13)
7.5.3.1.2	*Short-term toxicity **to birds***						◊(13)
7.5.3.1.3	*Effects on reproduction **of birds***						◊(13)
7.5.4.1	*Acute toxicity to honeybees and other beneficial arthropods, for example predators*				◊(14)		

* including sediment
** including groundwater; additionally bees and non-target arthropods are assessed if exposure is expected (see note 14)
*** calculation according to TGD on the basis of log Kow (see data requirements for the physico-chemical aspect.)

[1] It is recommended that the most recent fate and ecotox OECD guidelines are used for the tests.

[2] Submitted studies will be evaluated conform CRED , an updated method on reporting and evaluating ecotoxicity data.

- • Basic data requirement
- ◊ ( ) Additional data requirement, requested depending on the intended use pattern (or product type). More information is presented in the note and appendix for specified use patterns (product type).
- (1) In the event that the active ingredient is leached out of a matrix, leaching rates may be required. More information is presented based on the type of application (product type).
- (2) At least one test on ready OR inherent biodegradability is required. A test on ready biodegradability is recommended.
- (3) If the substance is to be used in an application with direct or substantial release to saltwater, a saltwater biodegradation test is required.
- (4) Anaerobic degradation studies may be relevant, for example for insecticides and disinfectants applied in stables that are released to soil via manure. If no data on anaerobic degradation is available, in the risk assessment exposure calculations will be used neglecting anaerobic degradation.
- (5) If the substance is to be used in an application with direct or substantial release to soil, it is necessary to perform an adsorption / desorption test (according to the new EC method C.18 or the corresponding OECD guideline 106).
- (6) The air compartment will be assessed where the depletion of the ozone layer is concerned. To this end, an AOPWIN calculation with standardised input parameters will suffice (concentration of OH-radicals in atmosphere 5.105 [molec.cm-3], 24 [h]; http://www.epa.gov/oppt/exposure/pubs/episuite.htm).
- (7) If the substance is to be used in an application with direct or substantial release to salt/brackish water, it is preferable that the aquatic toxicity tests are performed with marine/brackish species. However, this is not a strict requirement, because toxicity data from freshwater and saltwater species are normally interchangeable. However, for metals, chlorines and bromides, for example, this is not the case, and data with

species from the type of environment (saltwater/freshwater) in which the compound is emitted must be submitted. Tests are especially relevant for active substances in antifouling products (PT21)

(8) A test on Inhibition to microbiological activity (STP) is required to determine the PNEC (norm) for the STP. This study is required if in the use or waste stage the biocidal product is removed to the sewer/STP resulting in an indirect release to surface water or saltwater.

(9) This is necessary unless the release is intermittent or the intended use is limited to closed spaces with insignificant aquatic release.

(10) Substances with a BCF or Kp <100 are not expected to bioaccumulate. A study on bioaccumulation in fish is required if the initial data indicates that the substance has the potential to bioaccumulate and if the initial risk assessment indicates that there is a risk for birds and mammals. This may result in a request for further testing.

(10a) A bioaccumulation test with an invertebrate species may be required especially if a direct release to marine/brackish water occurs. A test with oysters or mussels could be performed.

(11) A study with sediment dwelling organisms is required if the initial risk assessment indicates a risk for sediment dwelling organisms and the substance is expected to adsorb to the sediment (log Kow >3 or log Koc >3). In general, sediment tests are not required for substances with a Koc <500 to 1000 which are not likely to be sorbed to sediment. A test with sediment dwelling organisms is considered a product specific requirement for anti-fouling products.

(12) As a rule of thumb, tests with terrestrial organisms are required when the substance is to be used in an application with direct or substantial release to soil.
In other cases of the total or partial absence of toxicity data for soil organisms, in the first tier the equilibrium partitioning method is applied to aquatic data to estimate the norm (PNEC) for soil organisms, for an initial risk assessment. If the risk assessment indicates a risk for soil organisms, then further data is requested: e.g. acute or even chronic tests on the basis of the “terrestrial toxicity testing strategy”. Acute toxicity tests will derive $L(E)C_{50}$ values. Long-term studies will be used to derive a NOEC. In principle, the terrestrial micro-organism test will be used for both EC_{50} and NOEC.

(13) Distinctions are made between acute (1 dose applied orally), short term (5 days exposure via food) and long-term food exposure (at least 2 generations including chicks). This is necessary if the substance is used as rodenticide (PT14), insecticide (PT18), repellent (PT19) or to control vertebrates (PT23) in an application used outside buildings in the form of baits, granulates or powder OR as a veterinary hygiene biocidal product (PT03) for use in poultry farms, where wild birds are attracted. If long-term data is available, acute and short term data can be omitted.

(14) This is necessary when the substance is to be used as insecticide (PT18) or insect repellent (PT19) in an application, with risk of exposure of honeybees and/or non-target arthropods.

Explanation for Basic data requirements (●)
For emissions to soil, STP, water, birds and mammals and non-target invertebrates, specific data is needed. Some of this data is described here:

- When ”ready biodegradability” (OEC 301) and “Inherent biodegradability” (OECD 302) are asked for, in most cases it is sufficient to submit the ready biodegradability test. Organic substances can be classified as inherently biodegradable based on laboratory tests with long-lasting exposure of the substance to micro-organisms, a suitable substance/biomass ratio, or another condition that promotes biodegradability. However, due to the favourable conditions in the test, a rapid degradation in the environment cannot be taken for granted. When a substance is found to be non-readily biodegradable and a study on inherent biodegradability is lacking, the

calculation of the Predictable Environmental Concentrations (PECs) will be based on the assumption that the substance is non-biodegradable.

- The air compartment will be assessed as far as adverse effects to the ozone layer are concerned. An AOPWIN calculation can be used with default input parameters (concentration of OH-radicals in atmosphere 5.10^5 [molec.cm^{-3}], 24 [h]; http://www.epa.gov/oppt/exposure/pubs/episuite.htm).
- The basic data requirements for eco-toxicity consist of three acute toxicity tests for fish, daphnia and algae.
- The basic data requirement for inhibition of microbiological activity is a sludge test. If an EC50 is available from efficacy testing, those figures will suffice.

Appendix 2B: Any additional endpoints for the environment

Supplementary data for an improved risk assessment

Test code	Data requirements	Environmental compartment or group of organisms exposed					
		Sewage treatment plant	Surface water*	Salt water*	Soil **	Air	Birds and mammals
	Fate and behaviour						
7.1.2.2.1	*Aerobic aquatic degradation study*		□(1)				
7.1.2.2.2	*Water/sediment degradation study*		□(1)				
7.2.1	*Aerobic degradation in soil, initial study*				□(2)		
7.2.2	*Aerobic degradation in soil, further studies*				□(2)		
7.2.2.1	*The rate and route of degradation including identification of the processes involved and identification of any metabolites and degradation products in at least three soil types under appropriate conditions*				□(2)		
	Effects on organisms						
7.5.1.1	*Inhibition to microbiological activity **(terrestrial)***				□ (3)		
7.5.2.1	*Reproduction study with earthworms or other soil non-target macro organism*				□ (4)		
7.5.2.2	*Long-term test with terrestrial plants*				□ (4)		

□( ) Additional studies recommended as refinement for the risk assessment

1 Degradation studies in water and water/sediment systems are recommended for substances that show a low degradation rate in ready biodegradability and/or inherent biodegradation tests. Studies in water/sediment systems are preferred, considering the higher level of realism, especially for substances with high sorption characteristics

2 Soil degradation studies are recommended for substances in biocidal products with direct emission to soil, especially for substances that show a low degradation rate in ready biodegradability and/or inherent biodegradation tests. It is preferred that this degradation is investigated in 3 different types of soil, including an anaerobic soil.

3 Study 7.5.1.1 is a minimum data requirement for substances used in products with direct emission to soil. Often these studies can only be used for derivation of an LC50 value. As refinement it is recommended to prepare a study in which a NOEC can be obtained.

4 Long term tests with earthworms and terrestrial plants are recommended, especially considering that these studies can be used to lower the assessment factors for derivation of the PNEC. For insecticides, tests with Collembola or other beneficial insects (e.g. Poecilus) are required as refinement.

Appendix 2C: Glossary for environmental section

Acute toxicity tests	Short-term tests (e.g. 48 to 96 hours' duration) from which an acute endpoint (LC50 or EC50) can be derived (50% Lethal concentration or 50% effect on growth concentration, for example).
Adsorption / desorption	Adsorption to desorption from solid surfaces is the main partitioning process that drives distribution in soil, surface waters, and sediments. The adsorption / desorption of a substance to/from soil, sediment, suspended matter and sludge can be obtained or estimated from: • direct measurement; • simulation testing; • Koc measured by adsorption studies (OECD106) or HPLC-method (OECD 21); • adsorption control within an inherent biodegradability test; • if no Koc is available, it may be estimated from Kow; • desorption is the reverse process.
Bioaccumulation	Refers to the accumulation of substances, such as pesticides, or other organic chemicals in an organism. Bioaccumulation occurs when an organism absorbs a substance at a rate greater than that at which the substance is lost. Bioaccumulation occurs within a trophic level, and is the increase in concentration of a substance in certain tissues of organisms' bodies due to absorption from food and the environment. Critical values for requesting bioaccumulation studies are: BCF > 100 and not readily biodegradable; BCF > 1000 and readily biodegradable; BCF > 2000 and PT substance: PBT substance BCF > 5000 and very persistent: vPvB substance
Bioconcentration	Is defined as occurring when uptake from the water is greater than excretion. This is often related to log Kow
Chronic toxicity tests	Long-term tests in which at least two sensitive life stages (e.g. eggs – larvae – infants – adults) of a species are tested. Full generation tests are preferred. These tests can be used to derive a NOEC (No Observed Effect Concentration). Effect parameters are often reproduction and growth
Direct release – emission - exposure	Direct release to a compartment occurs when immediately after or during use of the biocidal product, the biocidal product enters the compartment. Examples include: direct release to surface water NOT via a sewer and STP; or for example the outdoor disinfection of surfaces during the treatment, resulting in a release to soil; leaching from a paint coating to soil or water of materials in direct contact with soil or water. Direct release to soil necessitates ecotoxicity studies with soil organisms.

Effects on organisms	This concerns the toxic effects on organisms due to the mode of action of the chemical, causing for example increased mortality, reduced reproduction or reduced growth. Ecotoxicity tests can be performed with water organisms (e.g. fish, water fleas and algae), sediment dwelling organisms, soil organisms (e.g. earthworms, springtails, plants and soil micro-organisms), Micro-organisms in an STP, birds (e.g. quails) or mammals (e.g. rats or mice) or non-target invertebrates (e.g. bees or other beneficial insects/crustaceans). Accepted tests are carried out in line with standard test protocols, preferably OECD guidelines. The principle of these tests is that in several test systems a number of organisms of one species (e.g. salmon) are tested against the active substance at a number of concentrations, and a dose response relationship is determined. Two types of tests can be distinguished: short-term (acute) and long-term (chronic) tests
Emission Scenario Documents (ESD):	Description of uses and expected emissions to the environment worked in so-called Emission Scenario Documents (ESDs) specifically developed per product type within the framework of the biocidal directive. ESDs can be found at the ECHA website
Fate and behaviour characteristics	Aspects influencing the concentration in a compartment include removal processes such as Hydrolysis, Phototransformation in water or air, Ready or Inherent biodegradability, Biodegradation in seawater, Anaerobic biodegradation, Adsorption/desorption. Information on degradation rates, adsorption characteristics of the active substance or degradation products can be derived from standard OECD tests guidelines, for example. Some of these tests are core tests, others are additional information and required under specific conditions; see table.
Invertebrates and arthropods	An invertebrate is an animal without a skeletal structure. This group includes 95% of all animal species — all animals except those that are vertebrates (fish, reptiles, amphibians, birds, and mammals). Examples of invertebrates are arthropods (insects, arachnids and crustaceans), molluscs (shelfish), worms and sponges.
L(E)C50	Defined as concentration at which 50% of the animals die during the test or show an adverse effect (e.g. growth)
NOEC	Defined as “the highest concentration tested at which the measured parameter shows no significant adverse effect” (no observed effect concentration)
PBT or vPvB substances	Substances that fulfil criteria on (P) persistence, (B) bioaccumulation and (T) toxicity, or the criteria on (vP) very persistent, and vB very bioaccumulative. Criteria on PBT can be found In information requirements r11 paragraph r.11.2.2: Substances that fulfil these criteria will not be authorised unless emission to the environment is effectively prevented.
PEC	Predicted Environmental Concentration: Calculated concentration in a specific compartment e.g. water or soil. This concentration is calculated on the basis of the information in the PUB (document that describes the Practical Use of the Biocide), chemical fate and behaviour characteristics of chemical and emission scenarios.

PNEC:	The concentration below which unacceptable effects on organisms will most likely not occur (predicted no effect concentration).
Protection goals - Environmental compartments	Ecosystems in the aquatic, terrestrial and air compartment are to be protected. At present, the environmental risk assessment methodology has been developed for the following compartments: For inland risk assessment: • aquatic ecosystem (including sediment); • terrestrial ecosystem (including groundwater, bees and non-target arthropods); • predators (fish-eating and worm-eating vertebrates); • microorganisms in sewage treatment systems; • atmosphere. For marine risk assessment: • saltwater ecosystem (including sediment); • predators (mammals or birds eating fish or shellfish).
Risk assessment	Quantitative PEC/PNEC estimation a substance comparing compartmental concentrations (PEC) with the concentration below which unacceptable effects on organisms will most likely not occur (predicted no effect concentration (PNEC)). This includes also an assessment of food chain accumulation and secondary poisoning; Also effects on the microbiological activity of sewage treatment systems are considered. The latter is evaluated because proper functioning of sewage treatment plants (STPs) is important for the protection of the aquatic environment.
STP	Sewage Treatment Plant. If after use of the biocidal product waste water with the product is released to the sewer, then a risk assessment is performed on the basis of principles described in the Technical Guidance document (TGD)