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1. Overview

The intention of Consultation Paper 5 is primarily to consult on information to be included in the delegated legislation. In addition to the delegated legislation, we will publish a Characterisation Guide, which will be the primary supporting document. This will be prescribed in the delegated legislation, which means an introducer must use the guide when characterising the exposure and hazard of their chemical introduction. The Characterisation Guide will include:

- the types of information that will be considered sufficient for the purposes of hazard characterisation (commensurate with the Exposure Band)
- the release factors that are to be used when calculating the release volume for the characterisation of environmental exposure.

This document contains a draft of some of the material to be included in the Characterisation Guide. While it is not all the information that will be contained in the Guide, we are providing it with Consultation Paper 5 to give a sense of how the framework will work. This is consistent with our approach in drafting previous Consultation Papers.

In some instances, we are advising of our proposed approach to develop material for the Guide (e.g. release factors for use when determining the Exposure Band for environment). You are welcome to provide feedback on the approach and to provide information to aid in its development.

In other instances (e.g. information requirements), we are advising of information we propose to include in the Characterisation Guide. This information is still under development and you are welcome to provide feedback at this early stage.

We will release the draft Characterisation Guide, as well as guidance material on the categorisation process, for consultation once it is developed (including after considering any feedback received on this document).

Have your say on Consultation Paper 5

Stakeholders can make a formal submission on Consultation Paper 5, attend a public workshop in Sydney or Melbourne, or consult with NICNAS Reforms staff for further information.

Submissions close: 12 July 2017.

Please visit www.nicnas.gov.au/reforms for all details.
Email: NICNAS.Reforms@nicnas.gov.au
Call the Reforms Team: +612 8577 8837
2. Process for developing release factors for use when determining the Exposure Band for environment

General overview

Chemical introductions that must be categorised have 6 possible Exposure Bands for environment. In contrast to the criteria for human exposure (largely related to introduction volume), the criteria for the environment exposure are largely related to the release volume.

The release volume is estimated as a percentage of the maximum introduction volume expected to be released. It relies on the use of release factors.

The percentage used to calculate the release volume is called the release factor. The release factor indicates how much chemical is expected to be released across all parts of the environment. Release into the sewer is likely to be the major consideration for many introduced chemicals.

We propose to develop default release factors for a range of common release scenarios to help introducers determine release volumes. We will publish the default release factors and they must be used by introducers to determine the right Exposure Band for Environment.

We will establish a process to update the default release factors, including adding new scenarios and associated factors, as required.

For chemicals with multiple end uses, introducers can establish the release factors for each use scenario and their different introduction volumes. However, if the introduction volume for each use scenario is uncertain, introducers should apply the most conservative release factor.

For single use scenarios (or where the introduction volumes for each use scenario are uncertain)

\[
\text{Release volume} = \text{introduction volume} \times \text{release factor}
\]

or

\[
RV = IV \times RF
\]

For multiple use scenarios (1, 2, ..., n), where the introduction volume that will be allocated to each use scenario is known:

\[
RV = (IV \times RF)_1 + (IV \times RF)_2 + \ldots + (IV \times RF)_n
\]
Feedback from Consultation Papers 1-3, plus internal considerations, has resulted in the following proposal to develop default release factors for use when determining release volume.

Proposed process for developing release factors

The development of default release factors will need:

- examination of existing information sources, including:
  - those related to current NICNAS assessment processes (e.g. Risk assessment manual for industrial chemicals)
  - OECD emission scenario documents
  - European Chemicals Agency (ECHA) Guidance on Information Requirements and Chemical Safety Assessment: Use description (Chapter R.12) and Environmental exposure assessment (Chapter R.16)
  - additional emission scenario documents of OECD member countries (and generic scenarios developed by the US EPA)
  - literature and industry provided information
  - existing tools, e.g. Chesar (Chemical safety assessment and reporting tool).

- consideration of Australian specific conditions

- further consultation with stakeholders.

The default release factors would define a conservative estimate of the emissions from chemical life cycle stages, assuming no onsite risk management is in place. This is in line with the EU approach of initially estimating release using default release values.

Default release factors as shown in Figure 1 will be defined for scenarios that, where possible, take into account:

- life cycle stage, i.e. the main stages of a chemical’s life cycle, where there are potential releases to the environment (excluding accidental spillages, e.g. through transport and storage), such as:
  - manufacture (where relevant; usually site specific)
  - processing/formulation (usually site specific)
  - end use (point or diffuse release)
  - end-of-life.

- use pattern/industrial sector, i.e. proposed end uses of the chemical (e.g. solvent, dyestuff, adhesive, plasticiser or detergent), and the industry in which the chemical is to be used (e.g. cosmetics industry, coatings industry, mining industry or textiles industry)

- release compartments, i.e. destination of releases, including:
  - air (e.g. through smoke stack emissions, car exhaust fumes or aerosols)
  - water (e.g. release to sewage treatment facilities), and
  - soil (e.g. through over-spray of paints or deposition).
When determining the factors, we will take into account information:
- already provided
- provided in response to Consultation Paper 5.

We have already received information on cosmetic chemicals from industry in response to previous consultation papers and we welcome any further feedback.

Consultation on the proposed factors will take place later in 2017.

Figure 1 - Contributing elements to environment release factor

While the default release factors for categorising an unlisted chemical will be conservative estimates, the more information industry is able to provide during this consultation about release, the more refined our estimates will be.

Have your say:
Is there any information that you can provide to aid in the development of default release factors?
3. Categorising a chemical introduction - information requirements

Identifying hazards in the highest hazard bands (human health Hazard Band D or environment Hazard Band E)

Chemicals with the following characteristics/hazards will most often be categorised as Assessed.

- carcinogenicity
- mutagenicity
- reproductive and developmental toxicity
- chemicals with adverse effects known to be mediated by an endocrine disruption mode of action
- Persistent, Bioaccumulative and Toxic (PBT)
- ozone depleting chemicals.

For many chemicals, the data to allow the characterisation of hazards in the highest hazard bands for human health or environment may not be available. It may also be expensive and time-consuming to generate. Depending on the hazard characteristic and the Exposure Band for human health or the environment (as discussed in Consultation Paper 5 - Part 4), requiring data to characterise for these hazards would not be a proportionate regulatory requirement (especially for chemicals introduced at low volumes).

To avoid a situation where a known high concern chemical could be categorised as low risk (Reported) or very low risk (Exempted), the characterisation for these hazards would be based on known information. In screening for these hazards, an introducer would need to consider any:

- existing data for these hazards (such as existing hazard classifications in HCIS or animal test studies)
- relevant structural considerations (if relevant), and
- specified international lists of chemicals with hazards or structural features in the highest of the human health or environment hazard bands, deemed acceptable for categorisation purposes

A chemical will be characterised in the highest hazard bands and we will assess the chemical if it (or the chemical of which it is an ester or salt):

- has existing data showing any of these hazards
- is listed on Safe Work Australia’s Hazardous Chemical Information System (HCIS) or is listed on any of the specified international lists showing it has these hazards, or
- has relevant structural features.

The specified international lists must be scientifically robust in nature, so if a chemical (or chemical of which it is an ester or salt)
salt) is on any of the lists, it is assumed to have the relevant hazard (without the need for new data).

To ensure the robustness of the lists for this purpose, the specified international lists must meet the following criteria:

- Chemicals are included on the list on the basis of evidence showing the relevant human health and/or environmental hazards.
- The evidence must have been critically evaluated by reputable international regulatory agencies or a working group of experts.
- The reasons for inclusion on the list are clear.
- The list is regularly updated as new evaluations by the international body become available.
- The list is readily available to the public.

The following international lists are considered to meet these criteria:

- **European Chemicals Agency (ECHA) Harmonised Classification and Labelling of Hazardous Substances (Annex VI to the CLP Regulation)** (list of substances classified for CMR and PBT).
- **European Union Substances of Very High Concern (EU SVHC)** (list of carcinogenic, mutagenic, reproductive toxic substances, substances with endocrine disrupting potential, PBT and vPvB substances).
- **United States National Toxicology Program (US NTP) Report on Carcinogens** (list of carcinogenic substances).
- **International Agency for Research on Cancer (IARC) Monographs** (list of carcinogenic).
- **European Commission Endocrine Disruptors Strategy** (list of Category 1 substances with evidence of endocrine disrupting activity).
- **Stockholm Convention on Persistent Organic Pollutants List of POPs**—Annexes A, B and C (Persistent Organic Pollutants (POPs) with known health and/or environmental concerns).
- **the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade**—Annex III (pesticides and industrial chemicals with known health and/or environmental concerns).
- **the Montreal Protocol on Substances that Deplete the Ozone Layer Handbook**—Annexes A, B, C, E and F (chemicals linked to the depletion of the ozone layer).
- **the Kyoto Protocol—Synthetic Greenhouse Gases under Annex A** (organic chemicals that contribute to the greenhouse effect).
• the Minamata Convention on Mercury (mercury and its compounds, those having known health and/or environmental concerns)

• the International Convention on the Control of Harmful Anti-fouling Systems on Ships—Annex 1 (organotins, those being hazardous to marine life)

• the European Chemicals Agency (ECHA) List of substances included in Annex XIV of REACH and the Candidate List of substances of very high concern for Authorisation (inorganic and organic chemicals with known health and/or environmental concerns)

• the Environment and Climate Change Canada Toxic Substances List—Schedule 1 (inorganic and organic chemicals with known health and/or environmental concerns)

• CSCL Class I and II Specified Chemical Substances and CSCL Monitoring Chemical Substances as identified under the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. (CSCL—Chemical Substances Control Law of Japan) [chemical names are provided in English] (organic chemicals with known health and/or environmental concerns).

Other lists may be added over time if they meet the criteria for inclusion.

To facilitate the compliance with this requirement, we will investigate the feasibility of compiling and maintaining a consolidated resource that introducers would be able to access and search through our website.

### Information requirements to determine the human health introduction category

The information requirements to address the possible hazard characteristics of chemicals and low molecular weight polymers for human health are detailed in the following tables. These requirements describe the minimum information that you can use to categorise a chemical or low molecular weight polymer, as well as the information that you could use to characterise the chemical or low molecular weight polymer as not hazardous.

In all cases you will have to consider all information available to you regarding the hazards of your chemical, and characterise the hazards appropriately, weighing up all the available evidence.

See Part 5 of Consultation Paper 5 for discussion of general concepts related to the information requirements, including sources considered in determining the requirements. The information in the below tables is summarised by Exposure Band and includes examples of possible specified information waivers. The lists are not exhaustive; the examples of acceptable
information sources and information waivers are still under development.

The information requirements do not necessarily address all Hazard Band criteria as in some cases the chemical would only be in the Hazard Band:

(i) based on structural considerations and uncertainties associated with the hazard characteristics, or

(ii) the chemical was already known to have that hazard (e.g. from an existing HCIS classification), or

(iii) if the hazard characteristic was noted while addressing other specified requirements (e.g. specific target organ toxicity (single exposure) effects evident when addressing the requirements for acute toxicity).

Introducers should be careful to check information available to them to ensure correct categorisation of chemicals. Guidance documents on the above will expand and provide examples of information sources for such ‘only if known’ characteristics (some of these hazard characteristics are mentioned in the tables below).
**Mutagenicity and genotoxicity**

**Table 1 - General information on characterising chemicals for mutagenicity and genotoxicity endpoints per Exposure Band**

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To categorise (i.e. minimum needed) AND To characterise as not hazardous (optional)</td>
<td>Consult the relevant specified lists.</td>
<td>Information is not required as the chemical can be assumed to be genotoxic or mutagenic if:</td>
</tr>
<tr>
<td>1</td>
<td>No information required to categorise.</td>
<td>N/A</td>
<td>- Human data or epidemiological evidence indicates the chemical or suitable analogue(s) is known to induce heritable mutations in germ cells of humans.¹</td>
</tr>
<tr>
<td>2</td>
<td>To categorise <strong>and</strong> to characterise the chemical as not hazardous, you will need to: • check specified lists • consider all existing data and GHS classifications. These are required to determine if the chemical is known to be genotoxic or mutagenic.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ This could be derived from studies of genotoxic effects in humans exposed by accident, occupation or participation in clinical studies (e.g. from case reports or epidemiological studies).
**Hazard endpoint:** Mutagenicity and genotoxicity

3 To categorise the chemical, you will need to:
   - check specified lists, and
   - consider all existing data and GHS classifications.

To characterise the chemical as not hazardous you will need one of the following options:

**OPTION:**
- *in silico* screening (on the chemical only) that predicts the chemical is not genotoxic or mutagenic, AND
  - at least one *in vitro* assay (OECD TG 471, 473, 476, 487 or equivalent) test result performed on the chemical or suitable analogue(s) that predicts the chemical is not genotoxic or mutagenic.

**OPTION:**
- *in silico* screening (on the chemical only) that predicts the chemical is not genotoxic or mutagenic, AND
  - *in vitro* test result:
    - test report (on chemical or suitable analogue)
    - existing published information for the chemical or suitable analogue(s).

**In silico prediction:**
- OECD QSAR Toolbox
- Derek Nexus
- TOPKAT
- TIMES
- ToxTree
- MultiCASE
- VEGA
- CAESAR
- Hazard Expert

**As above.**

**In vitro test result:**
- test report (on chemical or suitable analogue)

**In vivo test result:**
- test report (on chemical or suitable analogue)
**Hazard endpoint**: Mutagenicity and genotoxicity

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• <em>in vivo</em> study (OECD TG 474, 475, 488 or 489 or equivalent) test result that shows the chemical or suitable analogue(s) is not genotoxic or mutagenic.</td>
<td>• existing published information for the chemical or suitable analogue(s).</td>
<td></td>
</tr>
</tbody>
</table>

4 When categorising the chemical and characterising the chemical as not hazardous you will need one of the following options:

**OPTION:**

*Two* *in vitro* assays (OECD TG 471, 473, 476, 487 or equivalent) performed on the chemical or suitable analogue(s).  
**Both** test results must predict that the chemical is not genotoxic or mutagenic, if chemical is to be characterised as not hazardous.

These test results need to address **both**:

- point mutations in microbial systems (OECD TG 471 or 476, or equivalent), AND
- chromosome damage in mammalian cells (OECD TG 473 or 487 or equivalent).

As above.  
As above.
**Hazard endpoint:** Mutagenicity and genotoxicity

<table>
<thead>
<tr>
<th>OPTION:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• <em>in silico</em> screening (on the chemical only) that predicts the chemical is not genotoxic or mutagenic, AND</td>
<td></td>
</tr>
<tr>
<td>• <em>in vivo</em> study (OECD TG 474, 475, 488 or 489 or equivalent) test result (and that shows the chemical or suitable analogue(s) is not genotoxic or mutagenic, if the chemical is to be characterised as not hazardous).</td>
<td></td>
</tr>
</tbody>
</table>

**OPTION:**

A combination of one *in vitro* assay (OECD TG 471, 473, 476, 487 or equivalent) **and** one *in vivo* test (OECD TG 474, 475, 488 or 489 or equivalent) performed on the chemical or suitable analogue(s).

*Both* test results must predict that the chemical is not genotoxic or mutagenic, if chemical is to be characterised as not hazardous.

The test results need to address *both*:

- point mutations in microbial systems (OECD TG 471 or, 476,
### Hazard endpoint: Mutagenicity and genotoxicity

<table>
<thead>
<tr>
<th>488, 489 or equivalent), AND</th>
</tr>
</thead>
<tbody>
<tr>
<td>• chromosome damage in mammalian cells (OECD TG 473, 474, 475, 487 or equivalent).</td>
</tr>
</tbody>
</table>

5. When categorising the chemical **and** characterising the chemical as not hazardous you will need one of the following options:

**OPTION:**

At least **two in vitro** assays test results performed on the chemical or suitable analogue (where **all** test results predict that the chemical is not genotoxic or mutagenic, if the chemical is to be characterised as not hazardous).

These test results need to address **both**:

- point mutations in microbial systems (OECD TG 471, 476, 488, 489 or equivalent), AND
- chromosome damage in mammalian cells (OECD TG 473, 474, 475 or 487 or equivalent).

**OPTION:**

As above.

As above.
### Hazard endpoint: Mutagenicity and genotoxicity

- *in silico* screening (on the chemical only) that predicts the chemical is not genotoxic or mutagenic, AND
- *in vivo* study (OECD TG 474, 475, 488 or 489 or equivalent) test result (that shows the chemical or suitable analogue is not genotoxic or mutagenic, if the chemical is to be characterised as not hazardous).

**OPTION:**  
A combination of one *in vitro* assay (OECD TG 471, 473, 476, 487 or equivalent) and one *in vivo* test (OECD TG 474, 475, 488 or 489 or equivalent) performed on the chemical or suitable analogue(s).  
**Both** test results must predict that the chemical is not genotoxic or mutagenic, if chemical is to be characterised as not hazardous.  
The test prediction and result need to address **both:**  
- point mutations in microbial systems (OECD TG 471 or, 476, or equivalent), AND
### Hazard endpoint: Mutagenicity and genotoxicity

- chromosome damage in mammalian cells (OECD TG 473 or 487 or equivalent).

### Guidance notes for required information

#### For *in silico* predictions:
- They are only acceptable if performed on the chemical to be introduced.
- They should include a screening of the chemical for all of the relevant mutagenicity and genotoxicity profiles.  
  - If one or more profiles produce a positive prediction, the chemical should be considered positive for these endpoints.
- They can only be used if the chemical is within the applicability domain of the *in silico* model.  
  - If the *in silico* information is found to be ‘out of domain’ (no prediction produced), the mutagenicity or genotoxicity potential of the chemical cannot be ruled out.
- They are only acceptable if they are used for consideration with at least one specified *in vitro* assay prediction or *in vivo* test result.

#### For *in vitro* assays:
- One *in vitro* test cannot address both point mutation (mutagenicity) and chromosome aberration mechanisms (genotoxicity).  
  - Therefore, the mutagenicity and/or genotoxicity potential of the chemical cannot be fully determined with one *in vitro* test alone.
- Where results from *in vitro* assays are required for consideration, if one or more assays produce a positive prediction, the chemical should be considered positive for these endpoints.
- Where an *in vitro* assay produces a positive prediction, further mutagenicity or genotoxicity studies (a different *in vitro* assay or *in vivo* study) may be necessary for further hazard characterisation of the mechanism.
• If the *in vitro* assay method cannot be conducted on the chemical or suitable analogue, or the assay prediction is inconclusive, the mutagenicity and/or genotoxicity potential of the chemical cannot be ruled out (and further hazard characterisation with respect to a different assay or test may be considered necessary).

For *in vivo* tests:

• A positive result from an *in vivo* test reasonably establishes genotoxicity potential for the purposes of categorisation.
• A negative result from an *in vivo* test reasonably rules out genotoxicity potential for the purposes of categorisation.
• If a test result is inconclusive, the genotoxicity potential cannot be ruled out and the chemical should be placed in Hazard Band D.
• A single *in vivo* test result (with a positive or negative result) reasonably negates an *in silico* or *in vitro* prediction for the same mechanism (either point mutation or chromosome damage).
Acute toxicity and specific target organ toxicity (STOT) after single exposure

The treatment of both of these hazard endpoints is relevant to hazard criteria spanning two separate hazard bands (Hazard Bands B and C). The following will help clarify the distinction between the hazard descriptions:

For acute toxicity:

- In Hazard Band C, acute toxicity is determined through characterisation of the chemical as fatal or toxic (by any exposure route). This characterisation aligns with GHS Categories 1, 2 or 3.
- In Hazard Band B, acute toxicity is determined through characterisation of the chemical as harmful (by any exposure route). This characterisation aligns with GHS Category 4.

For specific target organ toxicity (STOT) after single exposure:

- In Hazard Band C, specific target organ toxicity is determined through characterisation of the chemical as one that causes damage to organs by any route following single exposure. This characterisation aligns with GHS Category 1.
- In Hazard Band B, specific target organ toxicity is determined through characterisation of the chemical as one that may cause damage to organs by any route following single exposure, or may cause respiratory irritation or drowsiness or dizziness. This characterisation aligns with GHS Category 2.
Table 2 - General information on characterising chemicals for acute toxicity and specific target organ toxicity (STOT) after single exposure per Exposure Band

| Exposure Band(s) | Information requirements:  
| To categorise (i.e. minimum needed) AND  
| To characterise as not hazardous (optional) | Examples of acceptable sources of the information | Information waivers when categorising introductions: |
|---|---|---|---|
| 1 and 2 | No information required to categorise. | N/A | N/A |
| 3 | No information required to categorise. To characterise the chemical as not hazardous you will need one of the following options:  
OPTION:  
• in silico modelling (on the chemical only) which predicts LD50 > 2,000 mg/kg bw, AND  
• in vitro screening assay according to OECD GD 129 (normal human keratinocyte (NHK) or BALB/c 3T3 neutral red uptake (NRU) assays) performed on the chemical or | In silico prediction:  
• OECD QSAR Toolbox  
• HazardExpert  
• Topkat  
• CASE Ultra  
• T.E.S.T.  
• Derek Nexus  
• ACD/Percepta  
In vitro test result:  
• test report (on chemical or suitable | • Information is not required as the chemical can be assumed to be acutely toxic if:  
- the chemical is corrosive or severely irritating to the skin (GHS Category 1) or likely to be corrosive to the skin (i.e. the test chemical is a strong acid (pH ≤2.0) or base (pH ≥11.5)), together with high buffering capacity (if relevant).  
• Information is not required as the chemical can be assumed to be not acutely toxic:  
Via the oral route if:  
- in an oral subacute toxicity study a NOAEL ≥1,000 mg/kg bw/day was shown  
Via the dermal route if: |
**Hazard Endpoint:** Acute toxicity and specific target organ toxicity (STOT) after single exposure

| suitable analogue(s), which predicts an LD50 > 2,000 mg/kg bw. | analogue)  
|---|---|---|
| **OPTION:** | • existing published information for the chemical or suitable analogue(s). | • in an acute oral study the LD50 value > 2,000 mg/kg bw; or  
| In vivo study on the chemical or suitable analogue(s) for which the LD50 > 2,000 mg/kg bw (or an equivalent result in an inhalation study). | In vivo test result: | • in an acute oral study the LD50 value is in the range 300-2,000 mg/kg bw with a low (10%) dermal absorption (measured value\(^2\)). |

<table>
<thead>
<tr>
<th>4 and 5</th>
<th>When categorising the chemical and characterising the chemical as not hazardous you will need:</th>
<th>In vivo test result:</th>
<th>As above.</th>
</tr>
</thead>
</table>
| **OPTION:** | • Oral: OECD TG 425/423/420 or deleted TG 401 if data is from pre- | • test report (on chemical or suitable analogue)  
| One in vivo test result\(^\wedge\) on the chemical or suitable analogue(s): | existing published information for the chemical or suitable analogue(s). | existing published information for the chemical or suitable analogue(s). |

---

\(^2\) Measured dermal absorption value: In vitro OECD TG 428 result or existing in vivo OECD TG 427 result (both can be on the chemical or suitable analogue(s)).
**Hazard Endpoint:** Acute toxicity and specific target organ toxicity (STOT) after single exposure

<table>
<thead>
<tr>
<th>Dec 2002 (or equivalent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dermal: OECD TG 402 or draft 434</td>
</tr>
<tr>
<td>• Inhalation: OECD TG 403/436 or draft 433 (or equivalent).</td>
</tr>
</tbody>
</table>

For the chemical to be characterised as not hazardous, LD50 >2,000 mg/kg bw (or an equivalent result in an inhalation study).

^The *in vivo* study from which the test result is derived may address the oral route or whichever other route is most relevant.

**Guidance notes for required information**

For *in silico* predictions:

- Only acceptable if performed on the chemical to be introduced.
- Can only be used if the chemical is within the applicability domain of the *in silico* model.
  - if the in silico information is found to be ‘out of domain’ (no prediction produced), the acute toxicity potential of the chemical cannot be ruled out.
- *In silico* tools that are capable of predicting oral LD50 and/or inhalation LC50 values in the range of either ≤2,000 mg/kg bw or >2,000 mg/kg bw are acceptable (derivation of a precise value is not necessary).
- Preference is for the oral LD50 prediction.
  - However, the inhalation prediction may be preferred if this is the most relevant route of exposure of the chemical during end use.
- There are no *in silico* tools to predict acute dermal toxicity.
  - The predicted oral LD50 value may be used.

For *in vitro* assays:
• LD50 value regression calculation is undertaken based upon the experimental IC50 value, according to the OECD GD.
• Estimated LD50 values in the range of either ≤2,000 mg/kg bw or >2,000 mg/kg bw, are acceptable (derivation of a precise value is not necessary).
• If the in vitro assay method cannot be conducted on the chemical or suitable analogue(s), the acute toxicity potential of the chemical cannot be ruled out.

For in vivo tests:
• An oral 48h LD50 test result is preferred.
  - A dermal or inhalation test result may be preferentially used if that is the most relevant route of exposure of the chemical during end use.
• Derivation of a precise LD50 or LC50 value is not essential.
• The in vitro screening assay (OECD GD 129) may be utilised to determine a starting dose for in vivo testing, potentially reducing the number of animals required.
• If the test result is inconclusive, the acute toxicity potential cannot be ruled out, and the chemical should be considered to be in Hazard Band C on the basis of acute or specific target organ toxicity after single exposure.
  - Assuming a higher Hazard Band (i.e. Hazard Band D in this case) is not relevant based on other hazard characteristics (i.e. the chemical is not found to hold any of the Hazard Band D hazard characteristics, such as being genotoxic or mutagenic).
• A single in vivo test result (derivation of a LD50 or LC50 value) reasonably negates an in silico or in vitro prediction (predicted LD50 or LC50 value).

Specific target organ toxicity: narcotic effects
• Narcotic effects involve non-lethal depression of the central nervous system. In humans and animals, these effects are seen as symptoms such as drowsiness or dizziness.
• If available information shows that the chemical may have narcotic effects (i.e. may cause drowsiness or dizziness), the chemical is considered to have specific organ toxicity after a single exposure and cannot be characterised as not hazardous.
• Chemicals recognised as systemically acting volatile substances (e.g. some organic solvents) are generally found to have the potential for non-lethal narcotic effects.
Any existing and available data that provide evidence of the narcosis potential of the chemical should be taken into account. If there is existing information that characterises the chemical as having narcosis potential, consideration of this is needed to characterise the chemical as not hazardous.

There is no validated OECD TG specifically for narcotic effects and testing for narcotic effects is not required.

Indications of the chemical’s narcosis potential can be seen in human data (e.g. epidemiological evidence) or in vivo tests (e.g. acute toxicity) on the chemical or suitable analogue(s). Evidence may also be derived from OECD TG 424 on neurotoxicity, where any observed narcotic and sub-narcotic effects are to be considered.

Some physico-chemical parameters (e.g. high lipophilicity and vapour pressure) have been proposed as possible predictors of acute toxicity for systemically acting volatile compounds causing narcosis. In silico QSAR methodologies may generate relevant information. If there are indications that a substance may have a neurotoxic mechanism of action, QSAR modelling may be applied to find if structurally related chemicals are neurotoxic. This indication could be based on structural similarity with a known neurotoxicant (supported by adequate read-across justification) or on mechanistic in vivo or in vitro studies.

**Specific target organ toxicity: respiratory irritation**

If available information indicates that the chemical causes respiratory irritation, the chemical is considered to have specific organ toxicity after a single exposure and cannot be characterised as not hazardous.

Chemicals such as chloramines, aldehydes, unsaturated carbonic esters and reactive inorganic compounds are generally found to be respiratory tract irritants. Certain esters, after enzymatic cleavage to carbonic acids and alcohols in the nasal region, can also cause respiratory irritation.

Any existing and available data that provide evidence of the respiratory irritation potential of the chemical should be taken into account. If there is existing information that characterises the chemical as a potential respiratory irritant, consideration of this is required in order to characterise the chemical as not hazardous.

There is no validated OECD TG specifically for respiratory tract irritation, and testing for respiratory tract irritation is not a requirement.

Indications of the chemical’s potential to cause respiratory irritation can be seen in data derived from human or in vivo tests (e.g. OECD TG 403, 436, draft 433 or equivalent), via the inhalation route, on the chemical or suitable analogue(s).

While generally classification for this endpoint is derived from observations after single exposure, certain substances may cause irritant effects only after repeated exposure—for example, organic solvents. Information may also be obtained from observations in in vivo test OECD TG 412 or equivalent on the chemical or suitable analogue(s).
• Human data that show the chemical or suitable analogue(s) cause respiratory irritation could include non-standardised tests (inhalation chamber exposure test or pulmonary function test) or epidemiological evidence.
• Histopathological evaluation of the respiratory tract and/or examinations of nasal or bronchioalveolar lavage, as well as repeated inhalation studies, may provide important information for classification.
• Evidence may also be derived from some supporting tests developed by the American Society for Testing and Materials with focus on irritancy effects via the inhalation route (Alarie test, RD50 test or the “Standard Test Method for Estimating Sensory Irritancy of Airborne Chemicals”) on the chemical or suitable analogue(s).
• For volatile chemicals, the Inhalation Hazard Test (Annex to OECD TG 403) might give information on the potential for respiratory tract irritation.

Respiratory corrosion

• Consistent with the Guidance on the Classification of Hazardous Chemicals under the WHS Regulations, the non-GHS hazard statement (AUH071) for corrosive to the respiratory tract should be applied where relevant.
• If available information shows the chemical is corrosive to the respiratory tract, the chemical cannot be characterised as not hazardous.
• There is no validated OECD TG specifically for respiratory tract corrosion and testing for respiratory tract corrosion is not a requirement.
• Indications of the chemical’s potential to be corrosive to the respiratory tract can be seen in human or in vivo data (OECD TG 403, 436, draft 433, 412 or equivalent) on the chemical or suitable analogue(s). Human data that show the chemical or suitable analogue(s) cause respiratory corrosion could include non-standardised tests (inhalation chamber exposure test or pulmonary function test) or epidemiological evidence.
Specific target organ toxicity (repeated exposure)

Table 3 - General information on characterising chemicals for specific target organ toxicity (repeated exposure) endpoint per Exposure Band

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hazard Endpoint: Specific Target organ toxicity (repeated exposure)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                  | To characterise (i.e. minimum needed) AND To characterise as not hazardous (optional) | In vivo test result:  
- test report (on chemical or suitable analogue)  
- existing published information for the chemical or suitable analogue(s). | Information is not required as the chemical can be assumed to be toxic after repeated exposure if:  
- the chemical is corrosive or severely irritating to the skin (GHS Category 1) or likely to be corrosive to the skin (i.e. the test chemical is a strong acid (pH ≤2.0) or base (pH ≥11.5)), together with high buffering capacity (if relevant). |
| 1 and 2          | No information required to categorise. | N/A                                              | N/A                                              |
| 3                | No information required to categorise. | **In vivo test result:**  
- test report (on chemical or suitable analogue)  
- existing published information for the chemical or suitable analogue(s). | Information is not required as the chemical can be assumed to be toxic after repeated exposure if:  
- the chemical is corrosive or severely irritating to the skin (GHS Category 1) or likely to be corrosive to the skin (i.e. the test chemical is a strong acid (pH ≤2.0) or base (pH ≥11.5)), together with high buffering capacity (if relevant). |
| 4                | No information required to categorise. | **In vivo test result:**  
- test report (on chemical or suitable analogue) | As above. |

## Hazard Endpoint: Specific Target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Hazardous you will need:</th>
<th>28 day (or longer) <em>in vivo</em> study on the chemical or suitable analogue for which the result is sufficient to determine the chemical is not classified under the GHS for this endpoint.</th>
<th>Chemical or suitable analogue.</th>
</tr>
</thead>
</table>

5 When categorising the chemical **and** characterising the chemical as not hazardous you will need:

28 day (or longer) *in vivo* study*#* on the chemical or suitable analogue.

- **Oral:** OECD TG 407 (or equivalent)
- **Dermal:** OECD TG 410 (or equivalent)
- **Inhalation:** OECD TG 412 (or equivalent)

To characterise the chemical as not hazardous, the result should be sufficient to determine the chemical is not classified under the GHS for this endpoint.

- As above.

As above.

---

*#The *in vivo* study from which the test result is derived may address the oral route or whichever other route is most relevant.*

### Guidance notes for required information

For *in vivo* tests:

---

• Preference should be given to the most relevant route of administration, considering the likely routes of human exposure. However, due to limited availability of data for dermal and inhalational routes, oral data alone may be acceptable for this endpoint.
## Serious eye damage

### Table 4 - General information on characterising chemicals for serious eye damage endpoint per Exposure Band

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Hazard Endpoint:</strong> Serious eye damage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 2</td>
<td>No information required to categorise</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>No information required to categorise.</td>
<td><strong>In silico prediction:</strong></td>
<td>Information is not required as the chemical can be assumed to be seriously damaging to the eye if:</td>
</tr>
<tr>
<td></td>
<td>To characterise the chemical as not hazardous you will need one of the following options:</td>
<td>• OECD QSAR Toolbox</td>
<td>- The chemical is corrosive or severely irritating to skin (GHS Category 1).</td>
</tr>
<tr>
<td></td>
<td>1. to meet the information requirements for both serious eye damage and eye irritation:</td>
<td>• ToxTree</td>
<td>- The chemical has a pH ≤2 or a pH ≥11.5, the substance being a strong acid (pH ≤2.0) or base (pH ≥11.5), especially when associated with significant acid/alkaline reserve (buffering capacity).</td>
</tr>
<tr>
<td></td>
<td><strong>OPTION:</strong> In vitro assay (OECD TG 437, 438, 491 or equivalent) test result performed on the chemical or suitable analogue(s) that predicts the chemical is not seriously</td>
<td>• Derek Nexus</td>
<td>- The chemical is spontaneously flammable in air at room temperature.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MultiCASE</td>
<td>- The chemical has been classified as a Category 1 or 2 acute dermal hazard under the GHS (i.e., dermal toxicity ≤200 mg/kg)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• TOPKAT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Molcode QSAR Model</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ACD/Labs Percepta</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• PaDEL-DDPredictor</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• BfR Decision</td>
<td></td>
</tr>
</tbody>
</table>
**Hazard Endpoint:** Serious eye damage

<table>
<thead>
<tr>
<th><strong>OPTION:</strong></th>
<th><strong>In vitro test result:</strong></th>
<th><strong>In vivo test result:</strong></th>
</tr>
</thead>
</table>
| **In vivo study (OECD TG 405 or equivalent) test result on the chemical or suitable analogue which predicts that the chemical is not seriously damaging to the eye.** | • test report (on chemical or suitable analogue)  
• existing published information for the chemical or suitable analogue(s). | • test report (on chemical or suitable analogue)  
• existing published information for the chemical or suitable analogue(s). |
| **OR** | | bw). |
| **OPTION:** | | |
| **In vitro assay (OECD TG 460 or equivalent) test result performed on the chemical or suitable analogue(s) that predicts the chemical is not seriously damaging to the eye.** | | |
| **OPTION:** | | |
| **In silico screening (on the chemical only) that predicts the chemical is not seriously damaging to the eye.** | | |

4 and 5 When categorising the chemical **and** As above. As above.
### Hazard Endpoint: Serious eye damage

Characterising the chemical as not hazardous you will need one of the following options:

1. **to meet the information requirements for both serious eye damage and eye irritation:**

   **OPTION:**

   *In vitro* assay (OECD TG 437, 438, 491 or equivalent) test result performed on the chemical or suitable analogue (that predicts the chemical is not seriously damaging to the eye (or irritating), if the chemical is to be characterised as not hazardous).

   **OPTION:**

   *In vivo* study (OECD TG 405 or equivalent) test result on the chemical or suitable analogue (that predicts the chemical is not seriously damaging (or irritating) to the eye, if the chemical is to be characterised as not hazardous).

   **OR**

2. **to meet the requirements for serious eye damage (i.e. the below do not also allow determination**

|   |   |   |
**Hazard Endpoint:** Serious eye damage

<table>
<thead>
<tr>
<th><strong>OPTION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>In vitro</em> assay (OECD TG 460, or equivalent) test result performed on the chemical or suitable analogue (that predicts the chemical is not seriously damaging (or irritating) to the eye, if the chemical is to be characterised as not hazardous).</td>
</tr>
</tbody>
</table>

**Guidance notes for required information**

For *In silico* predictions:

- They are only acceptable if performed on the chemical to be introduced.
- They can only be used if the chemical is within the applicability domain of the *in silico* model.
  - If the in silico information is found to be ‘out of domain’ (no prediction produced), the potential of the chemical for serious eye damage cannot be ruled out.
  - A positive result reasonably establishes serious eye damage potential.

For *in vitro* assays:

- A positive result from an *in vitro* test reasonably establishes serious eye damage potential.
- A negative result from an *in vitro* test reasonably rules out serious eye damage potential.
- If the in vitro assay method cannot be conducted on the chemical or suitable analogue(s), the serious eye damage potential of the chemical cannot be ruled out.
- Supplement test results having a stepwise testing strategy for the determination of the eye irritation potential may be acceptable for this endpoint.
For *in vivo* tests:

- A positive result from an *in vivo* test reasonably establishes eye damage potential.
- A negative result from an *in vivo* test reasonably rules out serious eye damage potential.
- If the test result is inconclusive, the serious eye damage potential cannot be ruled out.
- An *in vivo* test result (either positive or negative) reasonably negates an *in silico* or *in vitro* prediction.
## Eye irritation

### Table 5 - General information on characterising chemicals for eye irritation endpoint per Exposure Band

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 and 2</td>
<td>No information required to categorise</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| 3                | No information required to categorise. To characterise the chemical as not hazardous you will need one of the following options:  
1. to meet the information requirements for both serious eye damage and eye irritation. | **In silico prediction:**  
- OECD QSAR Toolbox  
- ToxTree  
- Derek Nexus  
- MultiCASE  
- TOPKAT  
- Molcode QSAR Model  
- ACD/Labs Percepta  
- PaDEL-DDPredictor | • Information is not required as the chemical can be assumed to be irritating to the eye if:  
- The chemical is corrosive or severely irritating to skin (GHS Category 1).  
- The chemical has a pH ≤2 or a pH ≥11.5, the substance being a strong acid (pH ≤2.0) or base (pH ≥11.5), especially when associated with significant acid/alkaline reserve (buffering capacity).  
- The chemical is spontaneously flammable in air at room temperature.  
- The chemical has been classified as a Category 1 or 2 acute dermal hazard under the GHS (i.e., dermal toxicity ≤200 mg/kg bw). |
<table>
<thead>
<tr>
<th>Hazard Endpoint: Eye irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option:</strong></td>
</tr>
<tr>
<td><em>In vivo</em> study (OECD TG 405 or equivalent) test result on the chemical or suitable analogue, which predicts that the chemical is not irritating to the eye.</td>
</tr>
<tr>
<td><strong>OR</strong></td>
</tr>
<tr>
<td>2. To meet the requirements for eye irritation:</td>
</tr>
<tr>
<td><em>In silico</em> screening (on the chemical only) which predicts that the chemical is not irritating to the eye.</td>
</tr>
<tr>
<td><strong>4</strong></td>
</tr>
<tr>
<td>No information required to categorise.</td>
</tr>
</tbody>
</table>

To characterise the chemical as not hazardous you will need one of the following options (note that all options meet the information requirements for both serious eye damage and eye irritation):

- BfR Decision

*In vitro test result:*
- test report (on chemical or suitable analogue)
- existing published information for the chemical or suitable analogue(s).

*In vivo test result:*
- test report (on chemical or suitable analogue)
- existing published information for the chemical or suitable analogue(s).
**Hazard Endpoint**: Eye irritation

| OPTION: | In vitro assay (OECD TG 437, 438, 491, 492 or equivalent) test result performed on the chemical or suitable analogue(s), which predicts that the chemical is not irritating to the eye. | | |
| OPTION: | In vivo study (OECD TG 405 or equivalent) test result on the chemical or suitable analogue, which predicts that the chemical is not irritating to the eye. | | |

5 When categorising the chemical and characterising the chemical as not hazardous you will need one of the following options (note that all options meet the information requirements for both serious eye damage and eye irritation):

<p>| OPTION: | In vitro assay (OECD TG 437, 438, 491, 492 or equivalent) test result performed on the chemical or suitable analogue (which predicts that the chemical is not irritating to the eye, if the chemical is to | | |
| As above. | As above. | | |</p>
<table>
<thead>
<tr>
<th><strong>Hazard Endpoint:</strong> Eye irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>be characterised as not hazardous).</strong></td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td><em>In vivo</em> study (OECD TG 405 or equivalent) test result on the chemical or suitable analogue (which predicts that the chemical is not irritating to the eye, if the chemical is to be characterised as not hazardous).</td>
</tr>
</tbody>
</table>

**Guidance notes for required information**

**For *in silico* predictions:**
- They are only acceptable if performed on the chemical to be introduced.
- They can only be used if the chemical is within the applicability domain of the *in silico* model.
  - If the *in silico* information is found to be ‘out of domain’ (no prediction produced), the eye irritation potential of the chemical cannot be ruled out.
- A positive result reasonably establishes eye irritation potential.

**For *in vitro* assays:**
- A positive result from an *in vitro* test reasonably establishes eye irritation potential.
- A negative result from an *in vitro* test reasonably rules out eye irritation potential.
- If the *in vitro* assay method cannot be conducted on the chemical or suitable analogue(s), the eye irritation potential of the chemical cannot be ruled out.
- Supplement test results having a stepwise testing strategy to show eye irritation potential may be acceptable for this endpoint.

**For *in vivo* tests:**
- A positive result from an *in vivo* test reasonably establishes eye irritation potential.
• A negative result from an *in vivo* test reasonably rules out eye irritation potential.
• If the test result is inconclusive, the eye irritation potential cannot be ruled out.
• An *in vivo* test result (either positive or negative) reasonably negates an *in silico* or *in vitro* prediction.

**Toxicity by eye contact**

• Consistent with the Guidance on the Classification of Hazardous Chemicals under the WHS Regulations, the non-GHS hazard statement (AUH070) for systemic toxicity after eye contact should be applied where relevant.
• Indications of the chemical’s potential to cause systemic toxicity after eye contact can be seen in human or *in vivo* data (OECD TG 405, or equivalent) on the chemical or suitable analogue(s).
• Observations would include overt signs of systemic toxicity or mortality among the animals tested, which is likely to be attributed to absorption of the substance or mixture through the mucous membranes of the eye.
• If available information shows that the chemical causes systemic toxicity after eye contact, the chemical cannot be characterised as not hazardous, and will fall in Hazard Band C (assuming a higher Hazard Band is not relevant based on other hazard characteristics).
# Skin corrosion

## Table 6 - General information on characterising chemicals for skin corrosion endpoint per Exposure Band

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To categorise (i.e. minimum needed) AND To characterise as not hazardous (optional)</td>
<td></td>
<td>Information is not required as the chemical can be assumed to be corrosive to the skin if:</td>
</tr>
<tr>
<td>1 and 2</td>
<td>No information required to categorise. N/A N/A</td>
<td>1. The chemical has a pH ≤2 or a pH ≥11.5, the substance being a strong acid (pH ≤2.0) or base (pH ≥11.5), especially when associated with significant acid/alkaline reserve (buffering capacity).</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>No information required to categorise. To characterise the chemical as not hazardous you will need one of the following options:</td>
<td>In vitro test result:</td>
<td>- The chemical is spontaneously flammable in air at room temperature.</td>
</tr>
<tr>
<td></td>
<td>1. to meet the information requirements for corrosion only:</td>
<td></td>
<td>- The chemical has been classified as a Category 1 or 2 acute dermal hazard under the GHS (i.e., dermal toxicity ≤200 mg/kg bw).</td>
</tr>
<tr>
<td></td>
<td>OPTION:</td>
<td>In silico prediction:</td>
<td>- Human data (e.g. human patch testing or non-standardised data on local skin</td>
</tr>
<tr>
<td></td>
<td>In vitro assay (OECD TG 430, 431, 435 or equivalent) test result performed on the chemical or suitable analogue(s), which predicts that the chemical is not corrosive.</td>
<td>• OECD QSAR Toolbox</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ToxTree</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Derek Nexus</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OASIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• TOPKAT</td>
<td></td>
</tr>
</tbody>
</table>

|                  | | • test report (on chemical or suitable analogue) |
|                  | | • existing published |

*Note: The information provided is for illustrative purposes only and may not reflect the current status of regulatory requirements.*
**Hazard Endpoint:** Skin corrosion

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>In silico screening (on the chemical only), which predicts that the chemical is not corrosive.</th>
<th>information for the chemical or suitable analogue(s).</th>
<th>effects) or epidemiological evidence shows that the chemical or suitable analogue(s) is corrosive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR</td>
<td>2. to meet the information requirements for both corrosion and irritation:</td>
<td>In vivo test result:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OPTION:</td>
<td>• test report (on chemical or suitable analogue)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In vivo study (OECD TG 404 or equivalent) test result that shows the chemical or suitable analogue(s) is not corrosive or irritating.</td>
<td>• existing published information for the chemical or suitable analogue(s).</td>
<td></td>
</tr>
</tbody>
</table>

When categorising the chemical and characterising the chemical as not hazardous you will need one of the following options:

<table>
<thead>
<tr>
<th>1. to meet the information requirements for corrosion only:</th>
<th>As above.</th>
</tr>
</thead>
</table>

**OPTION:**

In vitro assay (OECD TG 430, 431, 435 or equivalent) test result performed on the chemical or suitable analogue (which predicts that the chemical is not corrosive).
**Hazard Endpoint**: Skin corrosion

<table>
<thead>
<tr>
<th>corrosive, if the chemical is to be characterised as not hazardous)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OR</strong></td>
</tr>
<tr>
<td>3. <strong>to meet the information requirements for both corrosion and irritation:</strong></td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td><em>In vivo</em> study (OECD TG 404 or equivalent) test result (that shows the chemical or suitable analogue is not corrosive or irritating, if the chemical is to be characterised as not hazardous).</td>
</tr>
</tbody>
</table>

**Guidance notes for required information**

**For in silico predictions:**

- They are only acceptable if performed on the chemical to be introduced.
- They should include a screening of the chemical for all relevant profiles for skin corrosion.
  - If one or more profiles produce a positive prediction, the chemical should be considered positive for this endpoint.
- They can only be used if the chemical is within the applicability domain of the *in silico* model.
  - If the in silico information is found to be ‘out of domain’ (no prediction produced), the skin corrosion potential of the chemical cannot be ruled out.
- A positive result reasonably establishes skin corrosion potential.

**For in vitro assays:**

- A positive result from an *in vitro* test reasonably establishes skin corrosion potential.
• A negative result from an *in vitro* test reasonably rules out skin corrosion potential.
• If the *in vitro* assay method cannot be conducted on the chemical or suitable analogue(s), the skin corrosion potential of the chemical cannot be ruled out.
• A test result from the in vitro assay OECD TG 428 (or equivalent) that shows the chemical or suitable analogue(s) is corrosive may be used as evidence for the purposes of categorisation.
  - It cannot be used to characterise the chemical as not hazardous with respect to skin corrosion.

For *in vivo* tests:
• A positive result from an *in vivo* test reasonably establishes skin corrosion potential.
• A negative result from an *in vivo* test reasonably rules out skin corrosion potential.
• If the test result is inconclusive, the skin corrosion potential cannot be ruled out.
• An *in vivo* test result (either positive or negative) reasonably negates an *in silico* or *in vitro* prediction.
• A test result from any of the following *in vivo* assays with focus on effects via the dermal route that shows the chemical or suitable analogue(s) is corrosive, may be used as evidence for the purposes of categorisation.
  - OECD TG 402, 406, 410, 411, 427, 429, 442A, 442B or equivalent.
  - These results cannot be used to characterise the chemical as not hazardous with respect to skin corrosion.
Skin irritation

Table 7 – General information on characterising chemicals for skin irritation endpoint per Exposure Band.

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To categorise (i.e. minimum needed) AND To characterise as not hazardous (optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 2</td>
<td>No information required to categorise.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>3</td>
<td>No information required to categorise.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To characterise the chemical as not hazardous you will need one of the following options:

1. **to meet the information requirements for irritation only:**

   **OPTION:**

   *In vitro* assay (OECD TG 439 or equivalent) test result performed on the chemical or suitable analogue, which predicts that the chemical is not irritating.

   **In silico prediction:**

   - OECD QSAR Toolbox
   - ToxTree
   - Derek Nexus
   - OASIS
   - TOPKAT

   **In vitro test result:**

   - test report (on chemical or suitable analogue)
   - existing published data

   • Information is not required as the chemical can be assumed to be irritating to the skin if:

   - The chemical is corrosive or severely irritating to skin (GHS Category 1).
   - The chemical has a pH ≤2 or a pH ≥11.5, the substance being a strong acid (pH ≤2.0) or base (pH ≥11.5), especially when associated with significant acid/alkaline reserve (buffering capacity).
   - The chemical is spontaneously flammable in air at room temperature.
   - The chemical has been classified as a Category 1 or 2 acute dermal hazard under the GHS (i.e., dermal toxicity ≤200 mg/kg bw).
<table>
<thead>
<tr>
<th><strong>Hazard Endpoint:</strong> Skin irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION:</strong> In silico screening (on the chemical only) which predicts that the chemical is not irritating.</td>
</tr>
<tr>
<td><strong>OR</strong></td>
</tr>
<tr>
<td>2. to meet the information requirements for both corrosion and irritation:</td>
</tr>
<tr>
<td><strong>OPTION:</strong> In vivo study (OECD TG 404 or equivalent) test result that shows the chemical or suitable analogue(s) is not corrosive or irritating.</td>
</tr>
<tr>
<td>information for the chemical or suitable analogue(s).</td>
</tr>
<tr>
<td><strong>In vivo test result:</strong></td>
</tr>
<tr>
<td>• test report (on chemical or suitable analogue)</td>
</tr>
<tr>
<td>• existing published information for the chemical or suitable analogue(s).</td>
</tr>
<tr>
<td>- Human data (e.g. human patch testing or non-standardised data on local skin effects) or epidemiological evidence shows that the chemical or suitable analogue(s) is irritating.</td>
</tr>
<tr>
<td>• Information is not required as the chemical can be assumed not to be irritating to the skin if:</td>
</tr>
<tr>
<td>- An acute toxicity study by the dermal route does not indicate skin irritation up to the limit dose level (2,000 mg/kg body weight).</td>
</tr>
</tbody>
</table>

<p>| 4 | No information required to categorise. |
| As above. |
| As above. |</p>
<table>
<thead>
<tr>
<th>Hazard Endpoint: Skin irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>chemical or suitable analogue, which predicts that the chemical is not irritating.</td>
</tr>
<tr>
<td><strong>OR</strong></td>
</tr>
<tr>
<td>2. to meet the information requirements for both corrosion and irritation:</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td>In vivo study (OECD TG 404 or equivalent) test result that shows the chemical or suitable analogue(s) is not corrosive or irritating.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5</th>
<th>When categorising the chemical and characterising the chemical as not hazardous you will need one of the following options:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. to meet the information requirements for irritation only:</td>
<td></td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
<td></td>
</tr>
<tr>
<td>In vitro assay (OECD TG 439 or equivalent) test result performed on the chemical or suitable analogue, which predicts that the chemical is not irritating.</td>
<td></td>
</tr>
<tr>
<td>As above.</td>
<td>As above.</td>
</tr>
</tbody>
</table>
### Hazard Endpoint: Skin irritation

**OR**

2. to meet the information requirements for both corrosion and irritation:

**OPTION:**

*In vivo* study (OECD TG 404 or equivalent) test result that shows the chemical or suitable analogue(s) is not corrosive or irritating.

---

**Guidance notes for required information**

For *in silico* predictions:

- They are only acceptable if performed on the chemical to be introduced.
- They should include a screening of the chemical for all relevant profiles for skin irritation.
- If one or more profiles produce a positive prediction, the chemical should be considered positive for this endpoint.
- They can only be used if the chemical is within the applicability domain of the *in silico* model. If the *in silico* information is found to be ‘out of domain’ (no prediction produced), the skin corrosion potential of the chemical cannot be ruled out.
- A positive result reasonably establishes skin irritation potential.

For *in vitro* assays:

- A positive result from an *in vitro* test reasonably establishes skin irritation potential.
- A negative result from an *in vitro* test reasonably rules out skin irritation potential.
- If the *in vitro* assay method cannot be conducted on the chemical or suitable analogue(s), the skin irritation potential of the chemical cannot be ruled out.
A test result from the in vitro assay OECD TG 428 (or equivalent) that shows the chemical or suitable analogue(s) is irritating may be used as evidence for the purposes of categorisation. It cannot be used to characterise the chemical as not hazardous with respect to skin irritation.

For *in vivo* tests:

- A positive result from an *in vivo* test reasonably establishes skin irritation potential.
- A negative result from an *in vivo* test reasonably rules out skin irritation potential.
- If the test result is inconclusive, the skin irritation potential cannot be ruled out.
- An *in vivo* test result (either positive or negative) reasonably negates an *in silico* or *in vitro* prediction.
- A test result from any of the following *in vivo* assays with focus on effects via the dermal route showing the chemical or suitable analogue(s) is irritating may be used as evidence for categorisation. These results cannot be used to characterise the chemical as not hazardous with respect to skin irritation. The assays are:
  - OECD TG 402, 406, 410, 411, 427, 429, 442A, 442B or equivalent.
## Skin sensitisation

Table 8 – General information on characterising chemicals for the skin sensitisation endpoint per Exposure Band.

<table>
<thead>
<tr>
<th>Hazard Endpoint: Skin sensitisation</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposure Band(s)</strong></td>
<td>To categorise (i.e. minimum needed) AND To characterise as not hazardous (optional)</td>
<td>In silico prediction: &lt;br&gt;• OECD QSAR Toolbox &lt;br&gt;• Toxtree &lt;br&gt;• Derek Nexus &lt;br&gt;• TIMES-SS &lt;br&gt;• HazardExpert &lt;br&gt;• TOPKAT &lt;br&gt;• CASE Ultra &lt;br&gt;• CAESER</td>
<td>Information is not required as testing cannot be conducted if: &lt;br&gt;• The chemical has a pH ≤2 or a pH ≥11.5, the substance being a strong acid (pH ≤2.0) or base (pH ≥11.5), especially when associated with significant acid/alkaline reserve (buffering capacity). &lt;br&gt;• The chemical is spontaneously flammable in air at room temperature. Information is not required due to other characterisation outcomes if: &lt;br&gt;• The chemical is corrosive or severely</td>
</tr>
</tbody>
</table>
**Hazard Endpoint:** Skin sensitisation

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Description</th>
<th>Examples/Criteria</th>
</tr>
</thead>
</table>
| In chemico assay according to OECD TG 442C (or equivalent) performed on the chemical or suitable analogue(s), which predicts that the chemical is not a skin sensitiser. | • Tox21  
• Toxcast  
• T.E.S.T.  
• ACD/Percepta  

**OPTION:**  
*In vivo* study (OECD TG 406, 429 or equivalent) on the chemical or suitable analogue(s) which shows the chemical is not a skin sensitiser.  

**In chemico/in vitro assay prediction:**  
• test report (on chemical or suitable analogue)  
• existing published information for the chemical or suitable analogue(s).  

**In vivo test result:**  
• test report (on chemical or suitable analogue)  
• existing published information for the chemical or suitable analogue(s).  |

4 and 5 To categorise the chemical you will need one of the following options:  

**OPTION:**  
*In silico* prediction on the chemical  

As above.  

irritating to skin (GHS Category 1).  

As above.
<table>
<thead>
<tr>
<th><strong>Hazard Endpoint:</strong> Skin sensitisation</th>
</tr>
</thead>
</table>

only.

AND

**Three in chemico/in vitro** test results (OECD TG 442C and OECD TG 442D and OECD TG 442E (or their equivalents)) on the chemical or suitable analogue(s).

For this option the following outcomes apply:

1. To be considered not a skin sensitiser, all four results must predict no skin sensitisation potential.

2. If one or more of the four results predicts skin sensitisation then the potential for this cannot be ruled out and the chemical should be considered positive for this endpoint. Based on this approach, if the first result the introducer produces is positive, they may consider this sufficient for categorisation.
**Hazard Endpoint:** Skin sensitisation

<table>
<thead>
<tr>
<th><strong>OPTION:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One <em>in vivo</em> (OECD TG 406, 429 or equivalent) test result on the chemical or suitable analogue(s).</td>
<td></td>
</tr>
</tbody>
</table>

**OPTION:**

Human testing (e.g. HRIPT) or epidemiological evidence\(^3\) that shows the chemical or suitable analogue(s) is a skin sensitiser.\(^4\)

To characterise the chemical as not hazardous you will need one of the following options:

**OPTION:**

*In silico* prediction on the chemical only which predicts that the chemical is not a skin sensitiser, **AND**

**Three *in chemico/in vitro* test results**

---

\(^3\) Existing human testing data, clinical data, data from occupational exposure and epidemiological data form an element (the AOP 'Adverse Outcome' element) of the stepwise approach in the skin sensitisation IATA. Generally, any available information relating to this element is considered as the preliminary step of the approach.

\(^4\) Human data cannot be used to determine that the chemical is not a skin sensitiser as these methods are not designed for hazard identification.
### Hazard Endpoint: Skin sensitisation

(OECD TG 442C and OECD TG 442D and OECD TG 442E (or their equivalents)) on the chemical or suitable analogue(s), which predict that the chemical is not a skin sensitiser. To be considered not a skin sensitiser, all four results must predict no skin sensitisation potential.

**OPTION:**

One *in vivo* (OECD TG 406, 429 or equivalent) test result on the chemical or suitable analogue(s), which shows the chemical is not a skin sensitiser.

---

**Guidance notes for required information**

For *in silico* predictions:

- They are only acceptable if performed on the chemical to be introduced.
- They can only be used if the chemical is within the applicability domain of the *in silico* model.
- If the *in silico* information is found to be ‘out of domain’ (no prediction produced), the skin sensitisation potential of the chemical cannot be ruled out.
- Tools that can predict skin sensitisation with metabolism simulation are preferable.
- Due to the complexity of predicting skin sensitisation potency (i.e. full hazard characterisation) from valid *in silico* methods, additional information in a weight of evidence approach should be provided.
- A positive result reasonably establishes skin sensitisation potential.
For *in chemico* and *in vitro* assays:

- If the *in chemico* assay method cannot be conducted on the chemical or suitable analogue, the sensitisation potential of the chemical cannot be ruled out.
- As the *in chemico* assay method does not predict the binding of metabolites of the chemical, it should be used with *in silico* predictions that include metabolism simulation.
- The currently available *in chemico/in vitro* data can only be used for hazard determination, not skin sensitisation potency determination.

For *in vivo* tests:

- A positive result from an *in vivo* test reasonably establishes skin sensitisation potential.
- A negative result from an *in vivo* test reasonably rules out skin sensitisation potential.
- If the test result is inconclusive, the skin sensitisation potential cannot be ruled out.
- An *in vivo* test result reasonably negates an *in silico* or *in vitro* prediction.
Respiratory sensitisation

- There is no agreed Adverse Outcome Pathway for respiratory sensitisation, nor OECD-validated test guideline. Testing for respiratory sensitisation is not a requirement.
- While skin sensitisers are not always respiratory sensitisers, evidence of skin sensitisation may indicate that the chemical has the potential for respiratory sensitisation.
- If available information (e.g. existing data, including human or non-validated data) shows the chemical is a respiratory sensitiser, the chemical cannot be characterised as not hazardous.
- Example information sources include the EU SVHC authorisation list for respiratory sensitisers (acc. Art. 57(f)) and the Danish EPA (Q)SAR Database.
- While not currently evaluated for quality assurance, *in silico* tool predictions may indicate a chemical’s potential for respiratory sensitisation activity. However, absence of activity does not indicate the absence of hazard. For example, the current version of the OECD (Q)SAR Toolbox encodes an endpoint-specific profiler for respiratory sensitisation.
Information requirements to determine the environment introduction category

The information requirements to address possible hazard characteristics of chemicals for environment are in the following tables.

These requirements describe the minimum information that you can use to categorise a chemical, as well as the information that you could use to categorise the chemical as Exempted.

In all cases, you will have to consider all information available to you regarding the hazards of your chemical and characterise the hazards by weighing up all available evidence.

Refer to Part 5 of Consultation Paper 5 for discussion of general concepts of the information requirements, including sources considered in determining the requirements. The information in the below tables is summarised by Exposure Band and includes examples of possible specified information waivers. The lists are not exhaustive. The examples of acceptable information sources and information waivers are still under development.

Sources of information for categorisation

You should use measured data\(^1\) on the chemical for categorisation wherever possible. If measured data on the chemical are not available, then information may be obtained for a suitable analogue or from \textit{in silico} models. We will identify acceptable \textit{in silico} models and provide guidance for applicants on using them for categorisation. We consider the \textit{in silico} models listed in Table 9 to be reliable for simple organic chemicals that have a discrete molecular structure. The models are available as free downloads from the internet. We may add more models in future if their reliability can be shown.

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|}
\hline
\textbf{Parameter} & \textbf{Model} & \textbf{Availability} \\
\hline
Aquatic ecotoxicity & ECOSAR & Free download \\
\hline
log\textsuperscript{10} K\textsubscript{OW} & KOWWIN & Free download (as part of EPISuite) \\
\hline
\end{tabular}
\caption{Approved software for chemical modelling for environment hazard endpoints.}
\end{table}

1 Measured data must be obtained from tests conducted according to standardised test guidelines, such as those published by the OECD, US EPA and ECHA.
*In silico* modelling is inappropriate for certain chemicals. These include surfactants, polymers, UVCB substances and chemicals containing inorganic elements (e.g. metals).

**Additional considerations for matrix categorisation**

If measured data on the chemical is not available, and *in silico* modelling is inappropriate, then it may be possible to use measured data from a suitable analogue.

The molecular structure of the chemical will also be required to determine if the chemical contains a metal of concern to the environment or a sequence of one or more fully fluorinated carbon atoms. This is needed in order to determine if the chemical will fall into the highest environment Hazard Band (Hazard Band E).
## Acute aquatic ecotoxicity

Table 10 – General information on characterising chemicals for acute aquatic ecotoxicity endpoint per Exposure Band.

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements: To categorise (i.e. minimum needed) AND To categorise as Exempted (optional)</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No information required to categorise.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>To categorise the chemical you will need to:</td>
<td>Specified lists.</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>• check specified lists, and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• consider all existing data and GHS classifications.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>These are required to determine if the chemical is known to be acutely very toxic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>As a minimum, to categorise the chemical, you will need to:</td>
<td>Specified lists.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• check specified lists, and</td>
<td><strong>In silico prediction:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• consider all existing data and GHS classifications.</td>
<td>• ECOSAR</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>In vivo test result:</strong></td>
<td>• test report (on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Information is not required as the chemical can be assumed not to be acutely ecotoxic if:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- the chemical is hydrolytically unstable (i.e. $t_\frac{1}{2}$ &lt; 12 hours)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- the chemical is a gas that is not expected to partition to the aquatic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Hazard Endpoint: Acute aquatic ecotoxicity

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**

*In silico* predictions (on the chemical only) for the toxicity to fish, invertebrates and algae which predict LC50/EC50/ErC50 values >10 mg/L.

**OPTION:**

*Three in vivo* test results on the chemical or suitable analogue(s) for:
  - fish (OECD TG 203 or equivalent)
  - invertebrates (OECD TG 202 or equivalent)
  - algae (OECD TG 201 or equivalent).

For the chemical to be categorised as Exempted the LC50/EC50/ErC50 results must be shown to be >10 mg/L.

**OPTION:**

A combination of *in silico* predictions (on the chemical only) and *in vivo* test results (on the chemical or suitable analogue(s)) covering the three trophic levels (fish invertebrates and algae), that all indicate the chemical has a molecular weight or number average molecular weight (NAMW) >1,000 Da, and does not have an overall cationic charge.
# Hazard Endpoint: Acute aquatic ecotoxicity

<table>
<thead>
<tr>
<th>4</th>
<th>As a minimum, to categorise the chemical you will need one of the following options:</th>
<th>In silico prediction:</th>
<th>Information is not required as the chemical can be assumed not to be acutely ecotoxic if:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION:</strong></td>
<td><strong>ECOSAR</strong></td>
<td>- the chemical is hydrolytically unstable (i.e. $t_{1/2} &lt; 12$ hours)</td>
<td></td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
<td><strong>In vivo test result:</strong></td>
<td>- the chemical is a gas that is not expected to partition to the aquatic compartment</td>
<td></td>
</tr>
<tr>
<td>Three <em>in vivo</em> test results on the chemical or suitable analogue(s) for:</td>
<td>• test report (on chemical or suitable analogue).</td>
<td>- the chemical has a molecular weight or number average molecular weight (NAMW) &gt; 1,000 Da, and does not have an overall cationic charge.</td>
<td></td>
</tr>
<tr>
<td>• fish (OECD TG 203 or equivalent)</td>
<td><strong>OPTION:</strong></td>
<td>Information is not required as part of the minimum for categorisation if:</td>
<td></td>
</tr>
<tr>
<td>• invertebrates (OECD TG 202 or equivalent)</td>
<td>A combination of <em>in silico</em> predictions (on the chemical only) and <em>in vivo</em> test results (on the chemical or suitable analogue(s)) that cover the three trophic levels (toxicity to fish, invertebrates and algae).</td>
<td>- the chemical is shown to have ready biodegradability, i.e. to not be persistent (in accordance with the persistence information requirements).</td>
<td></td>
</tr>
<tr>
<td>• algae (OECD TG 201 or equivalent).</td>
<td><strong>In silico prediction:</strong></td>
<td>- the chemical is shown to not be bioaccumulative (in accordance with the bioaccumulation information</td>
<td></td>
</tr>
</tbody>
</table>

- LC50/EC50/ErC50 values $> 10$ mg/L.
- The relevant OECD TGs acceptable for any *in vivo* test results are the same as the previous option.

In silico prediction:
- ECOSAR

In vivo test result:
- test report (on chemical or suitable analogue).
**Hazard Endpoint:** Acute aquatic ecotoxicity

The relevant OECD TGs acceptable for any *in vivo* test results are the same as the previous option.

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**
*In silico* predictions (on the chemical only) for the toxicity to fish, invertebrates and algae which predict LC50/EC50/ErC50 values >10 mg/L.

**OPTION:**
Three *in vivo* test results on the chemical or suitable analogue(s) for:
- fish (OECD TG 203 or equivalent)
- invertebrates (OECD TG 202 or equivalent)
- algae (OECD TG 201 or equivalent).

For the chemical to be categorised as Exempted the LC50/EC50/ErC50 results must be shown to be >10 mg/L.

**OPTION:**
A combination of *in silico* predictions (on requirements)

*Note:* This is because only one endpoint that shows not P, not B or not T is required in order to determine if a chemical is not PBT, and therefore not Assessed for this Exposure Band.
**Hazard Endpoint**: Acute aquatic ecotoxicity

<table>
<thead>
<tr>
<th>the chemical only) and in vivo test results (on the chemical or suitable analogue(s)) covering the three trophic levels (fish, invertebrates and algae), that all indicate the LC50/EC50/ErC50 values &gt;10 mg/L. The relevant OECD TGs acceptable for any in vivo test results are the same as the previous option.</th>
</tr>
</thead>
</table>
| **5 and 6** As a minimum, to categorise the chemical you will need one of the following options: **OPTION:** In silico predictions (on the chemical only) for the toxicity to fish, invertebrate and algae. **OPTION:** Three in vivo test results on the chemical or suitable analogue(s) for:  
  - fish (OECD TG 203 or equivalent)  
  - invertebrates (OECD TG 202 or equivalent)  
  - algae (OECD TG 201 or equivalent). **OPTION:** A combination of in silico predictions (on |
| As above. |
| - Information is not required as the chemical can be assumed not to be acutely ecotoxic if:  
  - the chemical is hydrolytically unstable (i.e. t ½ <12 hours)  
  - the chemical is a gas that is not expected to partition to the aquatic compartment  
  - the chemical has a molecular weight or number average molecular weight (NAMW) >1,000 Da, and does not have an overall cationic charge. |
**Hazard Endpoint:** Acute aquatic ecotoxicity

<table>
<thead>
<tr>
<th>the chemical only) <strong>and in vivo</strong> test results (on the chemical or suitable analogue(s)) that cover the three trophic levels (toxicity to fish, invertebrates and algae).</th>
</tr>
</thead>
<tbody>
<tr>
<td>The relevant OECD TGs acceptable for any <strong>in vivo</strong> test results are the same as the previous option.</td>
</tr>
</tbody>
</table>

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**

*In silico* predictions on the chemical only for the toxicity to fish, invertebrates and algae which predict LC50/EC50/ErC50 values > 100 mg/L.

**OPTION:**

**Three in vivo** test results on the chemical or suitable analogue(s) for:

- fish (OECD TG 203 or equivalent)
- invertebrates (OECD TG 202 or equivalent)
- algae (OECD TG 201 or equivalent).

For the chemical to be categorised as Exempted the LC50/EC50/ErC50 results...
### Hazard Endpoint: Acute aquatic ecotoxicity

must be shown to be >100 mg/L.

**OPTION:**

A combination of *in silico* predictions (on the chemical only) and *in vivo* test results (on the chemical or suitable analogue(s)) covering the three trophic levels (fish invertebrates and algae), that all indicate LC50/EC50/ErC50 values >100 mg/L.

The relevant OECD TGs acceptable for any *in vivo* test results are the same as the previous option.
## Bioaccumulation

**Table 11 – General information on characterising chemicals for bioaccumulation per Exposure Band.**

<table>
<thead>
<tr>
<th>Exposure Band(s)</th>
<th>Information requirements:</th>
<th>Examples of acceptable sources of the information</th>
<th>Information waivers when categorising introductions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>To categorise (i.e. minimum needed) AND To categorise as Exempted (optional)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>No information required to categorise.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| 2                | As a minimum, to categorise the chemical you will need to:  
• check specified lists  
• consider all existing data and GHS classifications.  
These are required to determine if the chemical is known to be persistent and bioaccumulative (PB). | Specified lists. | • Information is not required as the chemical can be assumed not to be bioaccumulative if:  
- the chemical has molecular weight or number average molecular weight (NAMW) > 1,000 Da  
- the chemical is hydrolytically unstable (i.e. $t_{1/2} < 12$ hours)  
- the chemical is highly water soluble (i.e. water solubility > 5 g/L). |
| 3                | As a minimum, to categorise the chemical, you will need to:  
Specified lists.  
Measured result: | | • Information is not required as the chemical can be assumed not to be bioaccumulative: |
**Hazard Endpoint:** Bioaccumulation

<table>
<thead>
<tr>
<th>Check specified lists</th>
<th>Test report (on chemical or suitable analogue).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider all existing data and GHS classifications.</td>
<td>In silico prediction:</td>
</tr>
<tr>
<td>These are required to determine if the chemical is known to be bioaccumulative.</td>
<td>KOWWIN.</td>
</tr>
</tbody>
</table>

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**

*In silico* prediction (on the chemical only) for the partition coefficient (log Kow) that predicts the log Kow value to be <4.2

**OPTION:**

Measured partition coefficient (log Kow) (OECD TG 107, 117, 123 or equivalent) for the chemical or suitable analogue that shows the log Kow value to be <4.2.

**OPTION:**

Measured bioconcentration factor (BCF) (OECD TG 305 or equivalent) or bioaccumulation factor (BAF) for the

- the chemical has an average number average molecular weight (NAMW) >1,000 Da
- the chemical is hydrolytically unstable (i.e. t½ <12 hours)
- the chemical is highly water soluble (i.e. water solubility >5 g/L).

**Information is not required for categorisation as Exempted if:**

- the chemical is shown to have ready biodegradability, i.e. to not be persistent (in accordance with the persistence information requirements

*Note: This is because only one endpoint that shows not P, or not B is required in order to determine if a chemical is not PB, and therefore can be categorised as Exempted for this Exposure Band.*
**Hazard Endpoint:** Bioaccumulation

<table>
<thead>
<tr>
<th>4</th>
<th>As a minimum to categorise you will need one of the following options:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION:</strong></td>
<td><em>In silico</em> prediction (on the chemical only) for the partition coefficient (log Kow).</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
<td>Measured partition coefficient (log Kow) (OECD TG 107, 117, 123 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
<td>Measured bioconcentration factor (BCF) (OECD TG 305 or equivalent) or bioaccumulation factor (BAF) for the chemical or suitable analogue.</td>
</tr>
</tbody>
</table>

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**

*In silico* prediction (on the chemical only) for the partition coefficient (log Kow)

- Information is not required as the chemical can be assumed not to be bioaccumulative if:
  - the chemical has molecular weight or number average molecular weight (NAMW) >1,000 Da
  - the chemical is hydrolytically unstable (i.e. $t_{1/2} < 12$ hours)
  - the chemical is highly water soluble (i.e. water solubility >5 g/L).

- Information is not required as part of the minimum for categorisation if:
  - the chemical is shown to have ready biodegradability, i.e. to not be persistent (in accordance with the persistence information requirements)
  - the chemical is shown to not be very toxic (in accordance with the aquatic toxicity information requirements).

*Note: This is because only one endpoint that shows not P, not B or not T is required in order to determine if a chemical is not PBT, and therefore not Assessed for this Exposure Band.*
### Hazard Endpoint: Bioaccumulation

<table>
<thead>
<tr>
<th>Information is not required for categorisation as Exempted if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- the chemical is shown to have ready biodegradability, i.e. to not be persistent (in accordance with the persistence information requirements)</td>
</tr>
</tbody>
</table>

Note: This is because only one endpoint that shows not P, or not B is required in order to determine if a chemical is not PB, and therefore can be categorised as Exempted for this Exposure Band.

<table>
<thead>
<tr>
<th>Information is not required as the chemical can be assumed not to be bioaccumulative if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- the chemical has an average number average molecular weight (NAMW) &gt; 1,000 Da</td>
</tr>
<tr>
<td>- the chemical is hydrolytically unstable (i.e. t ( \frac{1}{2} ) &lt; 12 hours)</td>
</tr>
<tr>
<td>- the chemical is highly water soluble (i.e. water solubility &gt; 5 g/L).</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>As above.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In silico prediction (on the chemical only) for the partition coefficient (log Kow).</td>
<td></td>
</tr>
<tr>
<td>Measured partition coefficient (log Kow) (OECD TG 107, 117, 123 or equivalent) for the chemical or suitable analogue.</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>As above.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured bioconcentration factor (BCF) (OECD TG 305 or equivalent) or bioaccumulation factor (BAF) for the chemical or suitable analogue that shows the BCF or BAF result to be &lt; 2000.</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>OPTION:</th>
<th>Information is not required as part of the</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured bioconcentration factor (BCF) (OECD TG 107, 117, 123 or equivalent) for the chemical or suitable analogue</td>
<td></td>
</tr>
</tbody>
</table>
### Hazard Endpoint: Bioaccumulation

<table>
<thead>
<tr>
<th>Measured bioconcentration factor (BCF) (OECD TG 305 or equivalent) or bioaccumulation factor (BAF) for the chemical or suitable analogue.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To categorise the chemical as Exempted you will need one of the following options:</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td><em>In silico</em> prediction (on the chemical only) for the partition coefficient (log Kow) that predicts the log Kow value to be &lt;4.</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td>Measured partition coefficient (log Kow) (OECD TG 107, 117, 123 or equivalent) for the chemical or suitable analogue that shows the log Kow value to be &lt;4.</td>
</tr>
<tr>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td>Measured bioconcentration factor (BCF) (OECD TG 305 or equivalent) or bioaccumulation factor (BAF) for the chemical or suitable analogue that shows the BCF or BAF result to be &lt;500.</td>
</tr>
<tr>
<td>minimum for categorisation if:</td>
</tr>
<tr>
<td>- the chemical is shown to have ready biodegradability, i.e. to not be persistent (in accordance with the persistence information requirements).</td>
</tr>
</tbody>
</table>

*Note: This is because only one endpoint that shows not P, or not B is required to determine if a chemical is not PB, and therefore not Assessed for this Exposure Band (as long as the chemical is also not T).*
## Persistence

### Table 12 – General information on characterising chemicals for persistence per Exposure Band.

<table>
<thead>
<tr>
<th><strong>Exposure Band(s)</strong></th>
<th><strong>Information requirements:</strong></th>
<th><strong>Examples of acceptable sources of the information</strong></th>
<th><strong>Information waivers when categorising introductions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>To categorise (i.e. minimum needed)</strong> AND <strong>To categorise as Exempted (optional)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>No information required to categorise.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
| 2                     | To categorise the chemical you will need to: | Specified lists. | • Information is not required as the chemical can be assumed to be persistent if:  
  - the chemical is inorganic.  
  - Information is not required as the chemical can be assumed not to be persistent if:  
  - the chemical is a biological substance, biochemical or biopolymer  
  - the chemical is hydrolytically unstable (i.e. $t_\frac{1}{2} < 12$ hours). |
  - check specified lists, and  
  - consider all existing data and GHS classifications.  
  These are required to determine if the chemical is known to be persistent and bioaccumulative (PB). |
### Hazard Endpoint: Persistence

As a minimum, to categorise the chemical you will need to:
- check specified lists, and
- consider all existing data and GHS classifications.

These are required to determine if the chemical is known to be PB or PBT.

To categorise the chemical as Exempted you will need one of the following options:

**OPTION:**
Measured photodegradability (OECD TG 316 or equivalent) for the chemical or suitable analogue shows the chemical degrades by >70% within a 28 day period.

**OPTION:**
Measured ready biodegradability (OECD TG 301 or equivalent) for the chemical or suitable analogue that shows the chemical degrades by >70% within a 28 day period, or the BOD/COD ratio is $\geq 0.5$.

Specified lists.

**Measured result:**
- test report (on chemical or suitable analogue).

- **Information is not required as the chemical can be assumed to be persistent if:**
  - the chemical is inorganic.

- **Information is not required as the chemical can be assumed not to be persistent if:**
  - the chemical is a biological substance, biochemical or biopolymer
  - the chemical is hydrolytically unstable (i.e. $t_{1/2} < 12$ hours).

- **Information is not required for categorisation as Exempted if:**
  - the chemical is shown to not be bioaccumulative (in accordance with the bioaccumulation information requirements).

Note: This is because only one endpoint that shows not P, or not B is required in order to determine if a chemical is not PB, and therefore can be categorised as Exempted for this Exposure Band.
<table>
<thead>
<tr>
<th></th>
<th>Hazard Endpoint: Persistence</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>To categorise the chemical you will need one of the following options:</td>
</tr>
<tr>
<td></td>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td></td>
<td>Measured hydrolysis as a function of pH (OECD TG 111 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td></td>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td></td>
<td>Measured photodegradability (OECD TG 316 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td></td>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td></td>
<td>Measured ready biodegradability (OECD TG 301 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td></td>
<td>To categorise the chemical as Exempted you will need one of the following options:</td>
</tr>
<tr>
<td></td>
<td><strong>OPTION:</strong></td>
</tr>
<tr>
<td></td>
<td>Measured photodegradability (OECD TG 316 or equivalent) for the chemical or suitable analogue shows the chemical degrades by &gt;70% within a 28 day</td>
</tr>
<tr>
<td>Measured result:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• test report (on chemical or suitable analogue).</td>
</tr>
<tr>
<td></td>
<td>• Information is not required as the chemical can be assumed to be persistent:</td>
</tr>
<tr>
<td></td>
<td>- the chemical is inorganic.</td>
</tr>
<tr>
<td></td>
<td>• Information is not required as the chemical can be assumed not to be persistent:</td>
</tr>
<tr>
<td></td>
<td>- the chemical is a biological substance, biochemical or biopolymer</td>
</tr>
<tr>
<td></td>
<td>- the chemical is hydrolytically unstable (i.e. t½ &lt;12 hours).</td>
</tr>
<tr>
<td></td>
<td>• Information is not required as part of the minimum for categorisation if:</td>
</tr>
<tr>
<td></td>
<td>- the chemical is shown to not be bioaccumulative (in accordance with the bioaccumulation information requirements)</td>
</tr>
<tr>
<td></td>
<td>- the chemical is shown to not be acutely very toxic (in accordance with the acute ecotoxicity information requirements).</td>
</tr>
</tbody>
</table>

**Note:** This is because only one endpoint that shows not P, not B or not T is required in order to determine if a chemical is not PBT, and therefore not Assessed for this Exposure Band.
<table>
<thead>
<tr>
<th>Hazard Endpoint: Persistence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPTION:</strong> Measured ready biodegradability (OECD TG 301 or equivalent) for the chemical or suitable analogue that shows the chemical degrades by &gt; 70% within a 28 day period or the BOD/COD ratio is ≥ 0.5.</td>
</tr>
<tr>
<td>• Information is not required for categorisation as Exempted if:</td>
</tr>
<tr>
<td>- the chemical is shown to not be bioaccumulative (in accordance with the bioaccumulation information requirements)</td>
</tr>
<tr>
<td>Note: This is because only one endpoint that shows not P, or not B is required in order to determine if a chemical is not PB, and therefore can be categorised as Exempted for this Exposure Band.</td>
</tr>
<tr>
<td><strong>5 and 6</strong> To categorise the chemical you will need one of the following options:</td>
</tr>
<tr>
<td><strong>OPTION:</strong> Measured hydrolysis as a function of pH (OECD TG 111 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td><strong>OPTION:</strong> Measured photodegradability (OECD TG 316 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td><strong>OPTION:</strong> Measured ready biodegradability (OECD TG 301 or equivalent) for the chemical or suitable analogue.</td>
</tr>
<tr>
<td>• Information is not required as the chemical can be assumed to be persistent if:</td>
</tr>
<tr>
<td>- the chemical is inorganic.</td>
</tr>
<tr>
<td>• Information is not required as the chemical can be assumed not to be persistent if:</td>
</tr>
<tr>
<td>- the chemical is a biological substance biochemical or biopolymer substance</td>
</tr>
<tr>
<td>- the chemical is hydrolytically unstable (i.e. t ½ &lt;12 hours).</td>
</tr>
<tr>
<td>• Information is not required as part of the minimum for categorisation if:</td>
</tr>
</tbody>
</table>
| - the chemical is shown to have ready
**Hazard Endpoint:** Persistence

| OPTION: | Measured photodegradability (OECD TG 316 or equivalent) for the chemical or suitable analogue shows the chemical degrades by >70% within a 28 day period. |
| OPTION: | Measured ready biodegradability (OECD TG 301 or equivalent) for the chemical or suitable analogue that shows the chemical degrades by >70% within a 28 day period or the BOD/COD ratio is ≥0.5. |

To categorise the chemical as Exempted you will need one of the following options:

Note: This is because only one endpoint that shows not P, or not B is required to determine if a chemical is not PB, and therefore not Assessed for this Exposure Band (as long as the chemical is also not T).
4. Suitability of analogues - proposed guidance

Analogue, as defined in Consultation Paper 5, means a chemical whose intrinsic physico-chemical, environmental or toxicological properties are likely to be similar to another chemical. This may be based on a number of properties, including structural, physico-chemical and toxicological.

We will develop guidance on the suitability of analogues in the context of categorisation of unlisted chemicals as well as our assessments and evaluations. The guidance will summarise insights learned from the use of analogue and category approaches in our previous assessments as well as the information provided in guidance documents by other agencies/bodies. We will consult on the draft guidance later this year.

The proposed guidance will:

- Outline the main approaches to data gap filling for a single chemical or a category of chemicals, in the context of categorisation of unlisted chemicals and our assessments and evaluations.
- Explain general aspects of the identification of suitable analogues and the structural/physico-chemical/toxicological considerations with several case studies.
- Explain the scientific, methodological background, mechanistic basis and robustness of the analogue and category approaches.
- Propose a step-by-step procedure for justifying the adequacy of the analogues for data gap filling.
- Address some specific issues on the use of analogues for certain types of chemicals like UVCBs and polymers.
- Provide reporting formats for analogue and category evaluations, including the format of supporting arguments/justification needed from industry when submitting analogue data.
- Refer to possible analogue searching tools/resources.
5. Specified chemical introductions – additional requirements

For some chemical introductions, the minimum information requirements will not be enough to determine the indicative risk and thus the right introduction category. This is because some classes of chemicals are known to have:

- increased potential for adverse health and environmental effects
- some end uses which result in increased exposure to humans or the environment.

We propose to define these classes of chemical introductions in the delegated legislation. The Characterisation Guide (and supporting guidance) will set out the extra information needed for categorisation. The examples below outline the additional information requirements and outcomes expected to apply to some of the specified classes and uses. It will be possible to apply for case-by-case information waivers when submitting applications for assessment. To allow us to conduct an adequate risk assessment during an assessment of these specified chemical introductions, we may request further information from introducers.

Chemical classes/uses of particular environmental concern

For chemical classes or uses that are of particular environmental concern (such as water treatment chemicals and biocides) the kinds of additional information that are likely to be needed follow. We consider it unlikely that all of these requirements would apply to a single class or end use of chemical.

They are:

- identification of sewage treatment plants that are expected to receive the bulk of the released chemical
- if released directly to water, additional information on receiving waters, such as identifying the waterbodies that would receive the chemical
- additional toxicity information, e.g. chronic toxicity information across multiple trophic levels, or toxicity to sediment dwelling organisms or earthworms
- hydrolysis and/or photolysis studies in water or soil
- additional information on degradation products.

Ultraviolet (UV) Filters

Definition

An ultraviolet (UV) filter is a substance solely or mainly intended to protect the skin against certain UV radiation by absorption, reflection or scattering of UV radiation.
Additional information and outcomes

To determine the right introduction category for the assessment of unlisted chemical introductions and for record keeping purposes, information on the following endpoints should be available for all chemicals intended as UV filters:

- photostability (UV absorption spectra)
- phototoxicity
- photosensitisation
- photomutagenicity/photogenotoxicity
- photocarcinogenicity
- bioavailability (via the oral and dermal routes)
- longer term (≥ 90 days) repeated dose toxicity by the oral and dermal routes
- reproductive toxicity (including toxicity to male fertility)
- carcinogenicity
- interaction potential (with another chemical used as an ultraviolet filter in a cosmetic to be applied to the skin).

This is consistent with the current information requirements for UV filters under the ICNA Act (Schedule E) and under the Therapeutic Goods Act (Australian regulatory guidelines for sunscreens – ARGS).

Genetically modified products (GM products)

Definition

We define a GM product to have the same meaning as in the Gene Technology Act 2000. That is, a GM product is a thing derived or produced from a genetically modified organism (GMO), other than a GMO itself.

Note that we regulate industrial chemicals that are GM products or contain GM products.

Additional information and outcomes

For the assessment of unlisted chemical introductions and for record keeping purposes, all industrial chemicals that are GM products or contain GM products must have the following additional information:

- Type of GMO that the GM product was derived or produced from.
- Information on the biological activity of the GMO that the GM product was derived or produced from.
- Information relating to the manufacturing of the GM product:
  - manufacturing processes
  - testing processes
  - process controls and validation/evaluation.
For GM products manufactured in Australia, identification of all manufacturing sites.
- Degree of purity.
- Identity and levels of impurities.
- Incidental constituents.
- For chemicals derived from GMOs, the concentration of GMO remaining with the chemical.

Chemicals in food contact materials

Definition

A chemical in food contact materials has an end use where the chemical may come into direct contact with food (including drinking water). For example, packaging, containers, kitchenware, tableware, pipes and filters.

Additional information and outcomes

If the chemical’s intended use is in food contact materials, the introducer must hold information about the approval status of the chemical for food contact use overseas.

To determine the right introduction category, for the assessment of unlisted chemical introductions, and for record keeping purposes, information on the following endpoints should be available for all chemicals intended for use in food contact materials:
- mutagenicity
- genotoxicity
- acute oral toxicity
- toxicity after repeated oral exposure.

If the chemical has hazards associated with any of these endpoints, it will go in the highest relevant hazard band and be categorised accordingly. This could result in categorisation of the chemical as Reported or Assessed. For all such chemicals, a food migration study must be available.

If all the necessary hazard information is indicative of no hazard, the chemical may be categorised as Exempted.

Certain chemicals with fluorinated functionality

Additional information and outcomes

Additional information requirements will apply to the assessment of chemicals and polymers that contain a sequence of \( \geq 4 \) or \( \leq 20 \) fully fluorinated carbon atoms. Note that all such chemicals and polymers will be categorised as Assessed due to their placement in Hazard Band D of the human health risk matrix and Hazard Band E of the environment risk matrix.

The additional information requirements for these chemicals and polymers will be consistent with the current published position on data requirements for notification of new chemicals with a perfluorinated carbon chain. We will need additional information for the chemical itself, as well as information on the chemical's degradation products.
Chemicals delivered directly to the lungs

Definition

Chemicals intended to be delivered directly to the lungs via an aerosol vapour. Examples include e-cigarettes, personal vaporisers, e-pens, e-cigars and e-hookah pens.

Additional information and outcomes

To determine the right introduction category for the assessment of unlisted chemical introductions and for record keeping purposes, information on the following endpoints should be available for all chemicals intended to be delivered directly to the lungs:

- acute inhalation studies
- subchronic toxicity after repeated inhalation exposure (> 28 days).

If the chemical has hazards associated with any of these endpoints, it will go in the highest of the relevant hazard bands and be categorised accordingly. This could result in categorisation of the chemical as Reported or Assessed.

If all the necessary hazard information is indicative of no hazard, the chemical may be categorised as Exempted.

Chemicals with aspiration hazard potential

Definition

Chemicals containing the following structural characteristics:

- n-primary alcohols with a composition of at least 3 carbon atoms but not more than 13
- isobutyl alcohols
- terpene alcohols
- ketones with at least 3 carbon atoms but less than 13
- hydrocarbons with at least 3 carbon atoms but less than 13.

Additional information and outcomes

Chemicals that may be fatal if swallowed and enter the airways (aspiration hazard) cannot be characterised as not hazardous. There is no validated OECD test guideline specifically for aspiration hazard. When categorising chemicals with the abovementioned structural characteristics (Exposure Band 5 only) and when characterising the chemicals as not hazardous (Exposure Bands 3-5), the viscosity must be determined. For further details on aspiration hazards and viscosity see OECD Series on Testing and Assessment Document No. 37.

A viscosity of 20.5 mm²/s or less at 40 °C indicates that the chemical may present an aspiration hazard (in accordance with the GHS).
The relevant viscosity is a measured value (e.g. according to OECD TG 114; there are currently no validated in silico tools for prediction of viscosity).

Biochemicals and biopolymers

Definition

Biochemical means a chemical, including a polymer, that is:

a) directly produced by living or once-living cells or cellular components, or
b) a derivative or modification of a chemical referred to in paragraph (a) in which the original chemical remains substantially intact.

Additional information and outcomes

Biopolymers will need to meet the relevant information requirements for polymers, whilst biochemicals will need to meet the relevant information requirements for chemicals. In addition to these requirements, to determine the right introduction category, for the assessment of unlisted chemical introductions, and for record keeping purposes, the following information must be available for all biochemicals and biopolymers:

- The concentration of remaining viable production organism in the final biochemical or biopolymer.
- If a viable production organism remains, information on any known adverse effects of the organism.

Using this information determines the appropriate introduction category of the biopolymer or biochemical. That is, the following should be accounted for when determining the appropriate introduction category:

- hazards of the production organism and
- the levels at which it is present with the chemical/polymer.

For the purposes of an assessment by us, the following information on all biochemicals or biopolymers will need to be provided:

- If genetically modified organisms were used for production.
- The species and strains used to produce the chemical.
- How the chemicals were purified or extracted from the production organism (detailed process operations to determine the possible presence of living organisms).
- Any possible harmful by-products.

Additional information and outcomes – enzymes

We will assume that enzymes are respiratory sensitisers unless the introducer has information to prove otherwise.
Reactive polymers

Definition

Polymer with reactive functional groups if all of the following apply:

- NAMW ≥1,000 and <10,000 Da
- ≥5% low MW oligomeric species <1,000 Da or ≥2% low MW oligomeric species <500 Da
- combined FGEW <1,000 (moderate concern groups only) or combined FGEW <5,000 (high concern and moderate concern groups).

Additional information and outcomes

If the polymer is in Exposure Band 4 or 5 and categorised as Assessed, information on the following endpoints should be available for all reactive polymers:

- Ames test (according to OECD TG 471 or equivalent).

Halogenated organic chemicals

Additional information and outcomes

To determine the right introduction category for the assessment of unlisted chemical introductions, and for record keeping purposes, information on the following endpoints should be available for all halogenated organic chemicals except acyl halides.

Ecotoxicity studies/information:

- toxic long-term aquatic toxicity on aquatic species (chronic tests), as well as sediment dwelling organisms
- aerobic and/or anaerobic transformation potential
- bioaccumulation in fish (aqueous and dietary exposure)
- inherent biodegradability in soil
- photolysis studies (atmospheric and aqueous, as dehalogenation pathways can lead to the formation of toxic congeners).

Toxicity studies/information:

- toxicokinetic studies
- long-term repeated dose studies (> 28 days)
- reproductive/developmental studies
- potential for disruption of the endocrine system (such as the assay described in Stoker et al 2004)
- androgen and oestrogen receptor binding potential.

If the chemical has hazards associated with any of these endpoints, it will go in the highest relevant hazard band and be categorised accordingly. This could result in categorisation of the chemical as Reported or Assessed.

If all the necessary hazard information is indicative of no hazard, the chemical may be categorised as Exempted.
6. Physico-chemical properties – information waivers

Applications for assessments by us will need information on the physico-chemical properties of the chemicals. The level of information that will be needed in the approved form to meet the requirements may vary based on the circumstances of the assessment, and will be consulted on later in the year.

Specified information waivers will apply for certain physico-chemical endpoints. The waivers may vary based on the circumstances of the assessment and it will be possible to apply for case-by-case information waivers.

Examples of specified information waivers for the physico-chemical endpoints are shown in Table 14. Note that these are still under development, and that we will consult on the detailed lists (and the accompanying circumstances of the assessment in which they would apply) later in the year.
Table 13 – Examples of specified information waivers for the physico-chemical endpoints.

<table>
<thead>
<tr>
<th>Physico-chemical endpoint</th>
<th>Information waivers when applying for an assessment by NICNAS</th>
</tr>
</thead>
</table>
| Melting point/freezing point | If the chemical:  
• Is a salt that is only stable as an aqueous solution.  
• Has a melting point/freezing point ≤ -25 °C or > 300 °C.  
• Undergoes a chemical reaction or decomposes. In this case, the temperature of the chemical reaction/decomposition point must be reported.  
• Has a pour point or softening point, which is more applicable to be reported.  
• Is a gas at room temperature and pressure. |
| Boiling point | If the chemical:  
• Is a salt that is only stable as an aqueous solution.  
• Has a boiling point > 300 °C.  
• Undergoes a chemical reaction or decomposes. In this case, the temperature of the chemical reaction/decomposition point must be reported and the boiling point under reduced pressure may also be estimated or measured.  
• Has a sublimation point, which is more applicable to be submitted.  
• Is a gas at room temperature and pressure. |
| Density | If the chemical:  
• Is only stable in solution in a particular solvent and the solution density is similar to that of the solvent. In such cases, an indication if the solution density is higher or lower than the solvent density is sufficient.  
• If the chemical is a gas. In this case, an estimation based on calculation shall be made from its molecular weight and the Ideal Gas Laws. |
| Vapour pressure | If the chemical:  
• Has a melting point > 360 °C. |
<table>
<thead>
<tr>
<th>Physico-chemical endpoint</th>
<th>Information waivers when applying for an assessment by NICNAS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Has a melting point between 200 °C and 360 °C, a limit value based on measurement or a recognized calculation method is sufficient.</td>
</tr>
<tr>
<td></td>
<td>• Has a large molecular weight (&gt;1,000 Da).</td>
</tr>
<tr>
<td></td>
<td>• Has no measurable boiling point (or boiling point &lt;0 °C).</td>
</tr>
<tr>
<td></td>
<td>• Is an ionic solid.</td>
</tr>
<tr>
<td>Water solubility</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is miscible in water (&gt;1,000 g/L, as per OECD Guideline 105).</td>
</tr>
<tr>
<td></td>
<td>• Is produced in an aqueous solution and is not available in an isolated form.</td>
</tr>
<tr>
<td></td>
<td>• Is hydrolytically unstable (t½ &lt;12 hours).</td>
</tr>
<tr>
<td></td>
<td>• Is surface active and forms a stable emulsion in water which cannot be separated by filtration or centrifugation methods.</td>
</tr>
<tr>
<td>Hydrolysis as a function of pH</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is readily reactive in the presence of water or moisture.</td>
</tr>
<tr>
<td></td>
<td>• Readily biodegrades, as per OECD Guideline 301.</td>
</tr>
<tr>
<td></td>
<td>• Has no readily hydrolysable groups and therefore is not expected to hydrolyse (based on structural formula).</td>
</tr>
<tr>
<td></td>
<td>• Has a water solubility of &lt;0.01 mg/L.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is inorganic</td>
</tr>
<tr>
<td></td>
<td>• Is hydrolytically unstable (t½ &lt;12 hours)</td>
</tr>
<tr>
<td></td>
<td>• Is surface active</td>
</tr>
<tr>
<td></td>
<td>• Is expected to have log Kow &gt;7</td>
</tr>
<tr>
<td></td>
<td>• Is not soluble in n-octanol or water (i.e. solubility &lt;0.01 mg/L in either n-octanol or water)</td>
</tr>
<tr>
<td></td>
<td>• Has a water solubility of &gt;5 g/L.</td>
</tr>
<tr>
<td>Physico-chemical endpoint</td>
<td>Information waivers when applying for an assessment by NICNAS</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>Adsorption and desorption</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is hydrolytically unstable (t½ &lt;12 hours)</td>
</tr>
<tr>
<td></td>
<td>• Has a water solubility of &lt;0.01 mg/L or the water solubility cannot be measured analytically</td>
</tr>
<tr>
<td></td>
<td>• Is an inorganic compound</td>
</tr>
<tr>
<td></td>
<td>• Is a gas at room temperature and pressure</td>
</tr>
<tr>
<td></td>
<td>• Is a polymer with NAMW &gt;1,000 Da.</td>
</tr>
<tr>
<td>Dissociation constant</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Does not contain functional groups that are readily dissociable (based on structural formula).</td>
</tr>
<tr>
<td></td>
<td>• Has a water solubility of &lt;0.01 mg/L.</td>
</tr>
<tr>
<td>Particle size (distribution)/fibre length (for solids only)</td>
<td>If the chemical will be introduced and used in a non-solid (e.g. aqueous solution) or granular form.</td>
</tr>
<tr>
<td>Flashpoint</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is inorganic</td>
</tr>
<tr>
<td></td>
<td>• Has an estimated flashpoint &gt;200 °C</td>
</tr>
<tr>
<td></td>
<td>• Has a flashpoint that can be accurately predicted by interpolation from existing characterised materials.</td>
</tr>
<tr>
<td>Flammability limits</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is a solid which is explosive or the chemical has pyrophoric properties.</td>
</tr>
<tr>
<td></td>
<td>• Is a gas at room temperature and pressure and the concentration of the flammable gas in a mixture with inert gases is so low that, when mixed with air, the concentration is at all times below the lower limit.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Is explosive or pyrophoric at room temperature</td>
</tr>
<tr>
<td>Physico-chemical endpoint</td>
<td>Information waivers when applying for an assessment by NICNAS</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• Is a liquid that is non-flammable in air, e.g. no flash point up to 200 °C</td>
</tr>
<tr>
<td></td>
<td>• Is a gas at room temperature and pressure, and having no flammable range</td>
</tr>
<tr>
<td></td>
<td>• Is a solid with a melting point ≤160 °C.</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>If the chemical:</td>
</tr>
<tr>
<td></td>
<td>• Does not have any chemical functional groups present, which are associated with explosive properties.</td>
</tr>
<tr>
<td></td>
<td>• Contains chemical groups associated with explosive properties which include oxygen and the calculated oxygen balance is &lt; -200.</td>
</tr>
<tr>
<td></td>
<td>• Contains chemical groups associated with explosive properties, but the exothermic decomposition energy is &lt; 500 J/g and the onset of exothermic decomposition is &lt; 500 °C.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Oxidising properties</th>
<th>If the chemical is:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Explosive.</td>
</tr>
<tr>
<td></td>
<td>• Highly flammable.</td>
</tr>
<tr>
<td></td>
<td>• An organic peroxide.</td>
</tr>
<tr>
<td></td>
<td>• Incapable of reacting exothermically with combustible materials, for example on the basis of the chemical structure. For example, organic chemicals not containing oxygen or halogen atoms or containing these elements but they are not chemically bonded to nitrogen or oxygen, or inorganic chemicals not containing oxygen or halogen atoms.</td>
</tr>
<tr>
<td></td>
<td>• A solid and the preliminary test indicates the chemical has oxidising properties (i.e. full test does not need to be conducted).</td>
</tr>
<tr>
<td></td>
<td>• A gas at room temperature and pressure. As there is no test method to find the oxidising properties of gaseous mixtures, the evaluation of these properties must be realised by an estimation method. This method is based on the comparison of the oxidising potential of gases in a mixture with that of the oxidising potential of oxygen in air.</td>
</tr>
</tbody>
</table>
**Have your say**

Stakeholders can make a formal submission on Consultation Paper 5, attend a public workshop in Sydney or Melbourne, or consult with NICNAS Reforms staff for further information.

**Make a formal submission**

**Online**

Please use the online form available at: https://www.nicnas.gov.au/reforms/have-your-say-on-consultation-paper-5

Microsoft Word (docx) or Rich Text Format (rtf) are the preferred submission formats.

If you wish to submit an Adobe Acrobat (pdf) document please also attach the original Microsoft Word document for accessibility purposes.

To meet accessibility requirements, all submissions will be published in HTML format.

**Post**

Hard copy submissions can be sent to:

NICNAS Reforms
GPO Box 58
Sydney NSW 2001

**Confidentiality**

Formal submissions will be published on the NICNAS website. If you would like all or part of your submission to be confidential, please clearly indicate this in your submission.

**Submissions close 12 July 2017**

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**Public workshops**

**Public workshop - Sydney**
Friday 16 June 2017 from 9.30 a.m. to 12.00pm
SMC Conference and Function Centre
66 Goulburn Street, Sydney NSW

**Public workshop - Melbourne**
Tuesday 20 June 2017 from 9.30 a.m. to 12.00pm
Cliftons Conference Centre
440 Collins Street, Melbourne VIC

**Register online**

To attend a CP5 workshop please register online at: https://www.nicnas.gov.au/reforms/Reforms-workshops-book-now

**Consult with NICNAS Reforms staff**

NICNAS Reforms staff are available for stakeholder briefings and additional consultation.

Please call: +612 8577 8837
Email: NICNAS.Reforms@nicnas.gov.au

**Submissions close 12 July 2017**