Structured Short Titles in Exposure Scenarios for communication

Instructions to define unambiguous Exposure Scenario short titles
Version 1.0

An initiative from Cefic / DUCC / ECHA

November 2014

This document was developed in the context of the CSR/ES Roadmap[1] initiative, under the umbrella of ENES (Exchange Network on Exposure Scenarios). It is the result of discussions and initial testing among ENES community members and is intended to serve as a basis for implementation in IT-systems. The CSR/ES Roadmap Coordination Group thanks Dr Dirk Henckels (Qualisys GmbH) for his active contribution.

Who should read this document?

This document is designed to support a harmonised approach for the creation and structuring of Exposure Scenario (ES) Short Titles. It contains guidelines for implementation of this approach in software applications used for compiling and issuing extended Safety Data Sheets.
It is aimed at:
- Companies generating extended Safety Data Sheets (SDS) for substances (typically registrants)
- Downstream User companies receiving extended Safety Data Sheets who need to understand how ES have been built and how to interpret their short titles to sort out the ES that may be applicable to their own uses
- Providers of electronic solutions/software applications for extended SDS.
- Downstream User organisations/trade associations involved in'use maps' at sector level.

Table of Contents

Background and Purpose

The lack of harmonisation in format and content of exposure scenarios (ES) communicated in the supply chain was identified as an area for improvement at the first meeting of ENES (Exchange Network on Exposure Scenarios: http://echa.europa.eu/about-us/exchange-network-on-exposure-scenarios).

It led to a number of remedy actions being undertaken under the CSR/ES Roadmap, notably Action 4.2 on 'harmonised layout for the ES for communication'. More information can be found on: http://echa.europa.eu/csr-es-roadmap.

In November 2012, it was agreed to work on harmonising ES short titles. The original purpose of the work was to establish a best practice for the table of content containing exposure scenario short titles at the beginning of the Safety Data Sheet annex. To serve this purpose, ES short titles must be understandable by the receiving 'human readers' and their transmission supported by IT-systems.

As a matter of fact, current exposure scenarios (ESs) use free text as short titles that do not support structured transmission (via ESCom XML) well enough, and can cause ambiguities or deviations between the short title and it associated ES content.

A DUCC/Cefic/ECHA working group developed a replacement to free-text short titles with a rule-based approach for the derivation of Structured Short Titles from the ES content, using standard phrases[2] only.

The rule-based assembly of Structured Short Titles from a limited set of ES elements has many advantages:

- Reduces manual work for ES authoring and facilitates maintenance of existing ESs
- Improves ES clarity by delivering consistency throughout the supply chain
- Indicates whether the building and assigning of all supported uses into ESs have been done in line with the Life Cycle Stage approach from the ECHA IR/CSR Guidance and are consistent with the exposure assessment
- Helps harmonising the presentation of exposure scenarios in extended SDS and
- Enables IT-processibility at Downstream User (DU) level (*e.g.* DUs may use Structured Short Titles in creation of their own safety data sheets for mixtures).

These ES Structured Short Titles are aimed to gradually replace current ES/GES 'free-text' short titles. They will be used in the creation of lists, *i.e.* a table of contents for annexes to safety data sheets of substances[3].

This document describes the composition and derivation rules of ES Structured Short Titles and aims to be logical, concise, clear and precise enough for software implementation, to deliver maximum shortness and uniqueness of ES short titles. These rules can be implemented fully automatically and show if the split of uses into ESs has been performed appropriately.

The scope of the present document is limited to exposure scenarios at the level of one Safety Data Sheet: one substance, one supplier.

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[2] Standard phrases are taken from the ESCom / EuPhraC phrase catalogue, which will need enhancements to offer all phrases necessary for Structured Short Titles. Those enhancements are discussed and included with the existing process and tools (http://draft.euphrac.eu)

[3] Note: ES Structured Short Titles are different from the ES titles. Annex IV to this document provides a comparison between the two concepts.

Composition and Readability

An ES Structured Short Title is a sequence of 'identifiers' (mostly use descriptors) which are taken from the data contained in the ES itself. Its main purpose is to form a 'human-readable' description of the ES content that allows one to distinguish between the different ESs within one safety data sheet, and helps DUs identify ES relevant to their sector or activity in the SDS annex.

In this sense, the Structured Short Title is meant to be an unambiguous "ES label". This has important implications:

- ES Structured Short Titles can only be derived from information which is contained in the ES, *i.e.* the titles cannot introduce additional data.

- ES Structured Short Titles consist of standard phrases only. This will be supported by the ESCom XML specifications and ESCom standard phrase catalogue to be able to convey ES (including short titles) electronically in the supply chain (for more information on ESCom, see Action 3.3 of the Roadmap on http://echa.europa.eu/csr-es-roadmap).

- Human readability requires terminology be concise and clear. Since shortness is achieved by applying logical sequencing and omitting elements that do not help to distinguish between different ESs, the SDS author will need to check that, after application of the rules, ES Structured Short Titles are unique by comparing all ES Structured Short Titles within one SDS. Assessing understandibility for recipients can be done using optional rules provided below.

A default algorithm that derives ES Structured Short Titles automatically is provided in Annex I, allowing to create Structured Short Titles for large numbers of exposure scenarios without user intervention.

A number of options are available, *i.e.* certain limited degrees of freedom in applying the rules, that can be implemented by IT systems or used if the rules are applied manually. The goal of these options is to improve readability of titles in certain cases.

Structured Short Title Identifiers

The following pieces of information are considered as „identifiers" for a Structured Short Title. Each identifier consists of one or more terms:

- Identifier 1 = Life Cycle Stage
- Identifier 2 = Market (including PC, AC, and SU use descriptors)
- Identifier 3 = other selected elements of the ES.

Each identifier consists of a 'human-readable' standard phrase selected from a pick-list.
Pick-lists are largely based on the use descriptors from the ECHA guidance on Information Requirements/Chemical Safety report, chapter R12[4].

- **Identifier 1, life cycle stage (LCS)**, selected from the following pick-list:
  - „Formulation including mixing, handling, repacking "
  - „Use at industrial sites"
  - „Use by professional workers"
  - „Consumer use"
  - „Service life (worker)"
  - „Service life (consumer)"

  Identifier 1 covers the main sectors of use: SU3, 21 and 22, as well as SU 10 from the Use Descriptor System.

- **Identifier 2, market information**: Product Category (PC), Article Category (AC) or Sector of Use (SU), (except SU3, 10, 21, 22 already covered by Identifier 1), from the use descriptor system or a combination thereof[5]. PC/AC and SU are often complementary, but it is not necessary to systematically include both of them in the Structured Short Title. In addition, it is possible that one use, thus one ES, covers several PCs or several SUs. In such a case, this will be indicated with the mention „various [PC/AC/SU]", as explained in the Rules section below.

- **Identifier 3, optional additional information selected from the following**:
  - Identifier 3.1, Containment, *e.g.* "open process", or "closed process", consistent with conditions of use applicable to all the activities (e.g. PROCs/ERCs) covered by the ES.
  - Identifier 3.2, Technical process, *e.g.* "dry process" (for solids only), "solvent-based process", "water-based process", "processing of organic liquids" .

  Identifiers 3.1 and 3.2 must be consistent with the information provided in the ES.

While Identifiers 1 and 2 have been extensively tested and shown to work for a large number of exposure scenarios, the proposed pick-lists for Identifiers 3.1 and 3.2 would benefit from further testing and may require minor adaptations in the future.

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[4] The lists of Use Descriptors are under review at the time of publication of this document. Please consult ECHA Guidance R12: http://echa.europa.eu/support/guidance for the latest information.
[5] As explained in the ECHA Guidance, SU (Sector of Use) codes and names refer to sectors or industries where the use is taking place while PC (Product Category) codes and names correspond to types of mixtures/products containing chemicals.

Should users of these Guidelines wish to submit proposals in relation to Identifier 3, this can be done at the following e-mail address: ducc.coordination@gmail.com[6].

Life Cycle Stage and Market Information are mandatory in a Structured Short Title, Containment and Technical process are optional.

In addition, not all Identifiers apply to all life cycle stages, as the following table outlines:

Additional Term	Subterm	Applicable to Life Cycle Stage... *(Rule 1; mandatory)*					
		Formulation	Use at industrial sites	Use by professional worker	Consumer use	Service life (worker)	Service life (consumer)
Identifier 2: Market *(Rule 2; mandatory)*	PC	X	X	X	X		
	AC					X	X
	SU		X	X		X	
Identifier 3.1: Containment *(Rule 3.1)*		X	X	X			
Identifier 3,2: Technical Process *(Rule 3.2)*		X	X	X			

'Mandatory' means that at least one identifier needs to be included in the Structured Short Title: it can be PC or AC or SU.

> So in summary:
>
> **ES Structured Short Title = Identifier 1+ Identifier 2 (+Identifier 3)**
>
> ***Identifier 1****: Life cycle stage (mandatory) – based on use descriptor(s)*
> ***Identifier 2****: Market information (mandatory) – based on use descriptor(s)*
> *Identifier 3: Additional information (optional) – based on standard phrases*

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[6] When doing so, they should explain the difficulty encountered by providing an example and suggest short standard phrases for submission into the ESCOM Phrases process, if appropriate. While we encourage sending such examples, we cannot guarantee individual feedback.

Rules

The paragraphs below explain the rules to be followed in order to build Structured Short Titles for an ES. The application of each rule generates each of the identifiers so that, at the end, the full Structured Short Title is generated.

Rules 1 and 2 cover the mandatory attributes, *i.e.* Identifiers 1 and 2 of the Structured Short Title, so they must be applied.

Rule 3 generates optional additions to be used only if they help making distinctions between ESs or if they are essential to the recipients' understanding. Their applicability to specific life cycle stages (see table before) are considered in the rules.

In the decision flows below,

- shapes in dark blue mark decisions

- shapes in light blue add text to the short title

- dark blue circles mean "end without action"

- "number of ...?" refers to the number of assigned use descriptors, being zero if the specific use descriptor type is not applicable.

On the next page, a common graph for rules 1 and 2 is provided.

Rule 1: Life cycle stage and PC/AC

For PC or AC, the user can decide whether to print the codes of the use descriptors in addition to the names (when PC=1, AC=1).
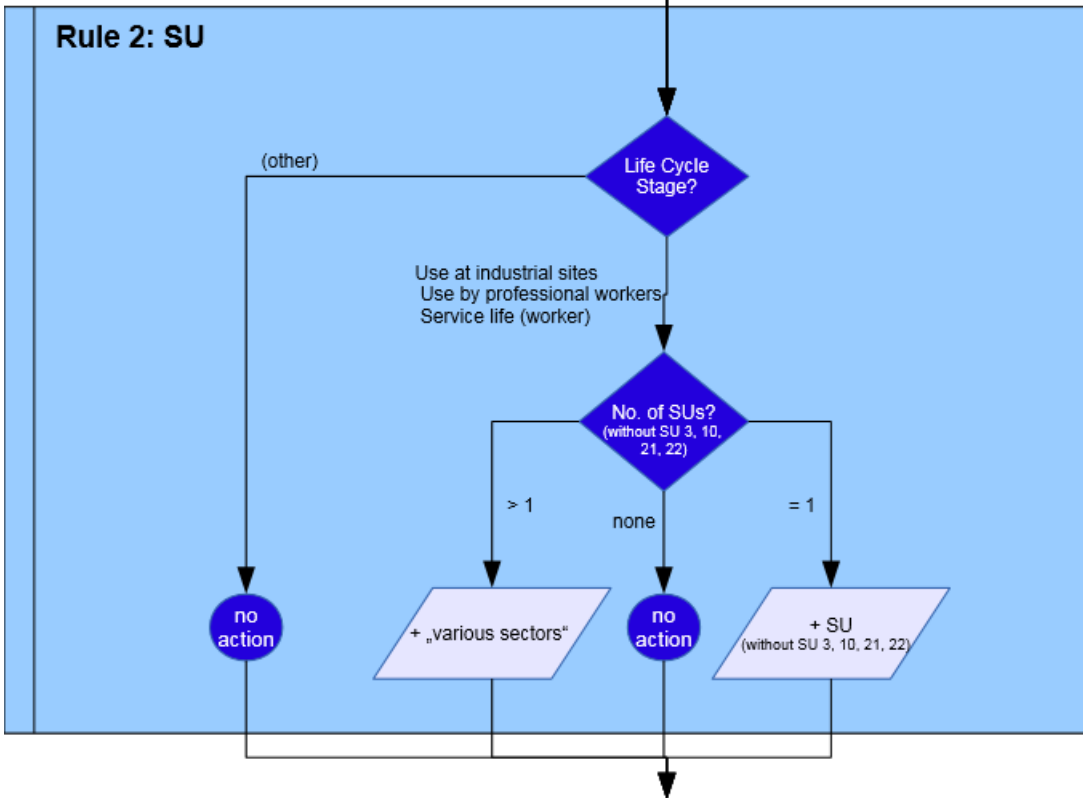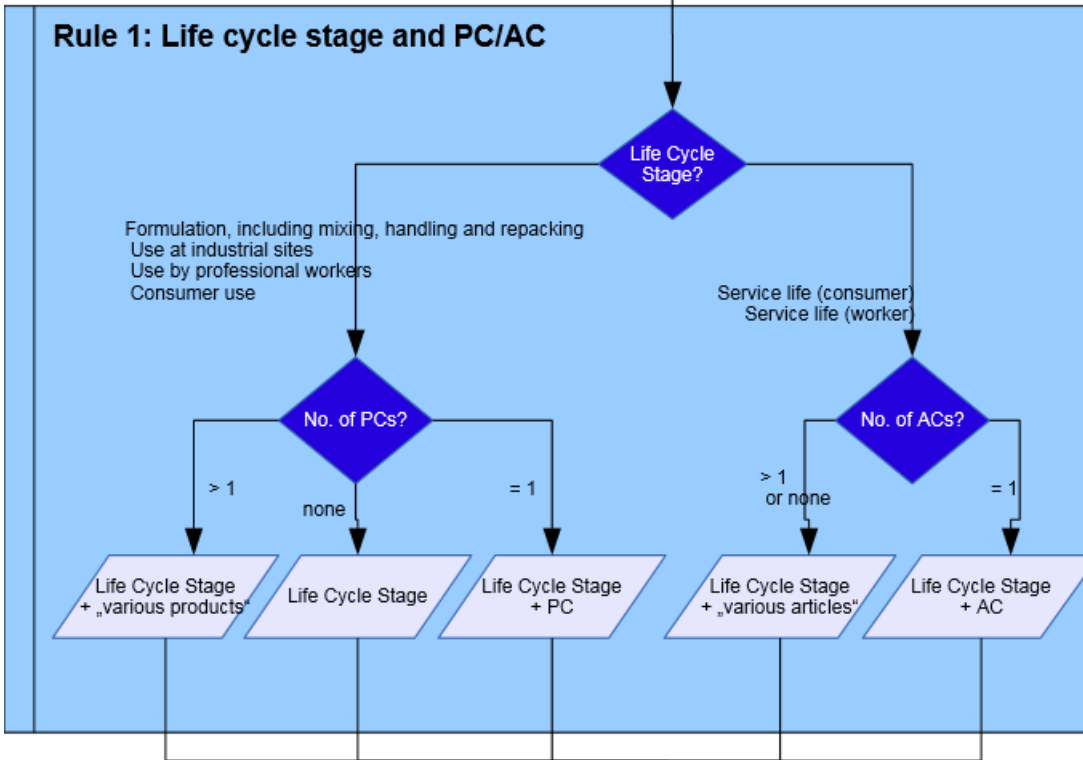
In the case of PC>1, AC>1, it is recommended to add the list of codes in brackets, for example: "Various products (PC3, PC27, PC35)". In addition to being useful for the recipient, this information may enable to distinguish two ES Structured Short Titles otherwise identical. However, if more than 5 PC or 5 AC apply, adding the codes in brackets is unlikely to be of value. Therefore, it has been agreed to limit the number of codes that can be added in brackets to a maximum of 5 (although users can be allowed to change this option in the system, when rules are applied by IT systems).

Rule 2: SU

Also for SU, the user can decide whether to print the codes of the use descriptors in addition to the names (when SU=1).

In the case of SU>1, it is recommended to add the list of codes in brackets.

Similarly to the rule on PC/AC, it has been agreed to limit the number of codes that can be added in brackets to a maximum of 5.

Rule 1: Life cycle stage and PC/AC

Life Cycle Stage?

Formulation, including mixing, handling and repacking
Use at industrial sites
Use by professional workers
Consumer use

Service life (consumer)
Service life (worker)

No. of PCs?

> 1

= 1

No. of ACs?

> 1
or none

= 1

Life Cycle Stage
+ „various products"

Life Cycle Stage

Life Cycle Stage
+ PC

Life Cycle Stage
+ „various articles"

Life Cycle Stage
+ AC

Rule 2: SU

(other)

Life Cycle Stage?

Use at industrial sites
Use by professional workers
Service life (worker)

No. of SUs?
(without SU 3, 10, 21, 22)

> 1

= 1

no action

+ „various sectors"

no action

+ SU
(without SU 3, 10, 21, 22)

Rules of Group 3

Rules of this group correspond to Identifiers 3.1 (Containment) and 3.2 (Technical Process).

For the sake of ES structured short title shortness, these identifiers are optional, *i.e.* should only be applied if needed to form unique short titles or if deemed essential for understanding at recipient level.

The order listed below is considered as the default order (*e.g.* for IT system implementation), but this order may be modified to improve readability.

Optional changes

No standard algorithm can cover every special case with the best possible solution. Therefore, users may decide to modify certain aspects of the algorithm (see Annex II) to improve readability:

1. The order of rules of Group 3 may be modified. This can help to describe important aspects first, depending on the substance/uses.

2. Once uniqueness is achieved, additional rules of Group 3 may still be applied. This can help to allow the reader sort out ES/uses, it can also improve understandibility at DU level, but it increases the length of titles.

3. It is left to the user's discretion to list use descriptor categories with the appropriate text in the short title. Especially after "various PC/AC/SU", this helps expert readers to understand the ES scope.

Other elements of the algorithm or rules must stay unchanged.

Rule 3.1: Containment
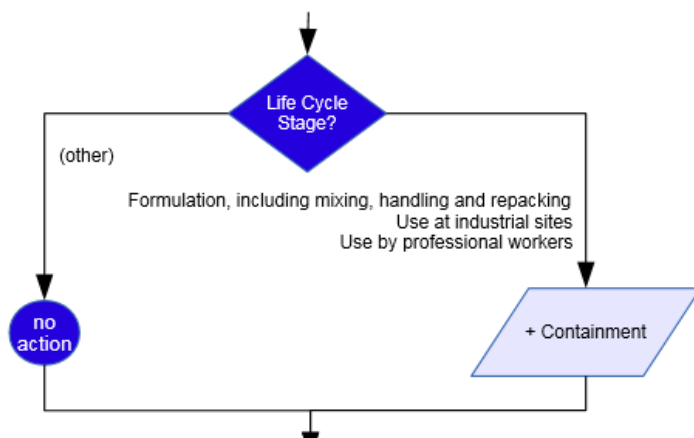
Rule 3.2: Technical Process
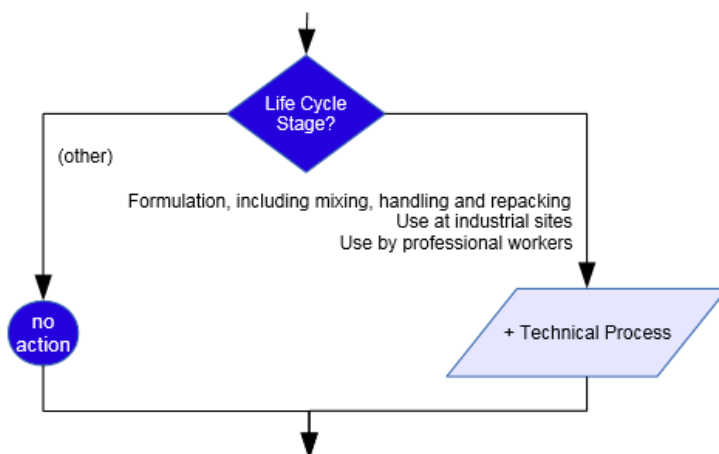
Applying the rules

As explained earlier, ES Structured Short Titles are the result of a selection of identifiers by the extended-SDS author (*i.e.* the sender of exposure scenarios). When rules are applied by IT systems, the aim is to achieve unique short titles within one extended SDS, *i.e.* the system stops when each ES has a unique structured short title. In addition, some options are provided for improving the understandability of the short title even if uniqueness has been achieved.

Uniqueness of ES Structured Short Titles in the context of a substance SDS requires the author of the ES, having the best product knowledge as well as knowledge of the CSA, to specify the appropriate identifiers from the ES. In some cases, the author of the ES may have to reflect on the output of the algorithm used for assembling the elements of the Structured Short Title and consider minor adaptations to some elements of the Title according to the options provided in this document.

The algorithm and rules generate Structured Short Titles that are meant to be conclusive for the purpose of sorting out of ES in an extended SDS.
At DU level, concluding whether an ES is relevant for a use to be covered cannot solely be done on the basis of the Structured Short Title as it needs a detailed look into the ES itself.

Generation of Structured Short Titles as a way to validate ES

The generation of Structured Short Titles may be useful for the author of the ES to consider whether the scope of the CSA/ES is appropriate. For example, if two ES carry the same Structured Short Title after application of all the rules, this is probably caused by one of the following reasons:
1. The information in the exposure scenarios is incomplete so that identifiers which would contribute to the title are missing.
2. The exposure scenarios with identical Structured Short Titles should be combined into one ES.
3. The exposure scenarios are different from each other and yet cannot be discriminated via the

rule set for Structured Short Titles. In this case, it is important that the ES title (see Annex IV) provide more explanations so that the receiving DU can decide which ES is applicable to his use.

Some of these considerations may lead to an update of the CSA/ES.

Transitioning to ES Structured Short Titles

Structured Short Titles are part of the ES for communication which is expected to be conveyed electronically in the supply chain using the ESCom package, which consists of an XML format and standard phrases.

The ESCom XML will therefore support the communication of Structured Short Titles, while free-text titles still exist in the supply chain. From a data exchange standpoint, this allows for a flexible transition period where both structured and free text short titles exist. IT softwares should be set up so that it is mandatory to fill at least one of the two options: free-text title or the Structured Short Title.

For IT systems not yet supporting it, ES Structured Short Titles can be manually copied into the free-text title field. With this procedure, it is not necessary to set a final date for the transition, while the advantages of the algorithm are immediately useful and implementation can start without delay.

ANNEXES

ANNEX I

Default Algorithm

The creation of an ES Structured Short Title is an iterative process to derive short titles by applying rules from the rule set described above, which consists of checking for ambiguities (*i.e.* identical short titles for different exposure scenarios) among the set of ESs of the document.

Each rule can add an Identifier to the short title. If ambiguities are found, apply the next rule to identical Short Titles.

Then check again for ambiguities and repeat the exercise until all short titles are unique or all rules are used.

To create reproducible results, it is necessary to apply all rules in the sequence of their numbering below. In semi-formal writing, the algorithm is the following:

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for each ES apply: rules 1 and 2

mark all ES with titles equal to those of other ES
while (marked ES exist) and (unused rules exist):
    for all marked ES apply:
        next rule of group 3
    mark all ES with titles equal to those of other ES
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The rule references printed in italics refer to rule graphs above.

Each rule may add a standard phrase to the Structured Short Title.

Text generated from different rules should be separated by a semicolon, with the end of an ES Structured Short Title marked with a full stop.

If all rules are used and there are still ambiguities, this means that the split into ES may need to be reviewed, *e.g.* the affected ESs should be combined into one, or it means that the ES information is incomplete and thus insufficient to describe the differences between two (or more) ES.

In case the review reveals that the exposure scenarios are different from each other and cannot be discriminated via the rule set for Structured Short Titles, no action is required.

ANNEX II

Examples of ES Structured Short Titles, according to the Rules.

Note: these ES Structured Short Titles are not derived from a single SDS.

- Formulation, including mixing, handling repacking; various products.
- Use at industrial sites; fuels (PC13).
- Use at industrial sites; manufacture of fine chemicals (SU9).
- Use at industrial sites; various products (PC20, PC37); electricity, steam, gas water supply and sewage treatment (SU23).
- Use at industrial sites; intermediate (PC19); various sectors (SU8, SU9).
- Consumer use; various products (PC31, PC35).
- Consumer use; washing and cleaning products (including solvent based products) (PC35).
- Service life (consumer); electrical batteries and accumulators (AC3).
- Use by professional workers; plant protection products; open process[7].

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[7] In this case, a third identifier has been used 'open process' (provisional standard phrase, subject to change).

ANNEX III

Examples of Tables of Content for Safety Data Sheet Annexes, providing an overview of exposure scenarios based on Structured Short Titles Rules

These two examples were developed from existing extended-SDS during the testing phase, by applying the rules provided in this document. Both substances are a surfactant.

These examples illustrate that Tables of Content could be successfully derived using Rules 1 and 2 only. ES Structured Short Titles generated were all unique so that Identifier 3 was not needed. In some cases, the listing of use descriptor codes in brackets was essential to distinguish one ES Structured Short Title from the other ones (see Example 2).

EXAMPLE 1: TABLE OF CONTENT – Substance X

ES1 - Formulation, including mixing, handling and repacking; Washing and cleaning products (including solvent based products) (PC35).

ES2 – Use at industrial sites; Leather tanning, dye, finishing, impregnation and care products (PC23).

ES3 – Use by professional workers; Leather tanning, dye, finishing, impregnation and care products (PC23).

ES4 – Service life (consumer); Leather articles (AC6).

ES5 - Use at industrial sites; Textile dyes, finishing and impregnating products; including bleaches and other processing aids (PC34).

ES6 – Use by professional workers; Textile dyes, finishing and impregnating products; including bleaches and other processing aids (PC34).

ES7 - Service life (consumer); Fabrics, textiles and apparel (AC5).

ES8 - Use at industrial sites; Washing and cleaning products (including solvent based products) (PC35).

ES9 - Use by professional workers; Washing and cleaning products (including solvent based products) (PC35).

ES10 – Consumer use; Washing and cleaning products (including solvent based products) (PC35).

EXAMPLE 2: TABLE OF CONTENT – Substance Y

ES1 - Formulation, including mixing, handling and repacking; Various products.

ES2 - Use at industrial sites; Various products (PC3, PC8, PC31, PC35).

ES3 - Use at industrial sites; Various products (PC12, PC27).

ES4 - Use at industrial sites; Various products (PC23, PC24, PC34); Manufacture of textiles, leather, fur (SU5).

ES5 - Use at industrial sites; Various products (PC20, PC21, PC32); Manufacture of plastics products, including compounding and conversion (SU12).

ES6 - Use at industrial sites; Adhesives, sealants (PC1).

ES7 - Use by professional workers; Various products (PC28, PC29, PC35, PC39).

ES8 - Use by professional workers; Various products (PC14, PC15, PC35).

ES9 - Use by professional workers; Adhesives, sealants (PC1).

ES10 - Use by professional workers; Various products (PC23, PC34).

ES11 - Use by professional workers; Biocidal products (e.g. Disinfectants, pest control) (PC8); Agriculture, forestry, fishery (SU1).

ES12 - Use by professional workers; Various products (PC12, PC27); Agriculture, forestry, fishery (SU1).

ES13 - Consumer use; Washing and cleaning products (including solvent based products) (PC35).

ES14 - Consumer use; Cosmetics, personal care products (PC39).

ES15 - Consumer use; Adhesives, sealants (PC1).

ES16 - Consumer use; Textile dyes, finishing and impregnating products; including bleaches and other processing aids (PC34).

ES17 - Use at industrial sites; Metal surface treatment products, including galvanic and electroplating products (PC14).

ANNEX IV: clarification short titles vs ES title in the ES for communication

Concept	Explanation	Standardisation	Present in registration dossier (if yes, IUCLID section/ field)	Present in supply chain communication (If yes, where in the ES[8])	Example
ES title	This name is important to uniquely label the nature and scope of the activities covered. Compared to the ES Structured Short Title for communication, it allows for more specificity as it does not have to be built on elements standardised upfront. It can include free-text that needs however to be agreed at sector level. It helps DUs to confirm that the ES is applicable to their uses.	At sector level via use maps	YES: -IUCLID section 3.5 /field 'Identified Use name' - CSR: field 'ES name'	YES, section 1 Title section/ field 'ES/use name'	Use of vehicle cleaning products in car manufacturing sites
ES Structured Short Title for communication	ES Structured short Titles are used in the table of content at the beginning of the Safety Data Sheet annex. They help recipient DUs to sort out the relevant ES from the Annex to the SDS.	Built from use descriptors or standard phrases following these guidelines agreed at ENES	NO	YES, field 'ES title [short title]'	Use at industrial site; Washing and cleaning products (including solvent based products)

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[8] Sections referred to from the ES annotated templates published by ECHA: http://echa.europa.eu/support/guidance-on-reach-and-clp-implementation/formats