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Second Workshop on REACH Review Action 3

Improving the workability and quality of extended Safety Data Sheets

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Pre-reading: Building Blocks for Solution Scoping document

Disclaimer:

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Glossary

Cefic	European Chemical Industry Council
CSA	chemical safety assessment
CSR	chemical safety report
DNEL	derived no-effect level
DU	Downstream user (includes formulators and end users)
EQS	environmental quality standard
ES	Exposure scenario
ESCom	Exposure scenario for communication
GES	generic exposure scenario
IED	Industrial Emissions Directive
LCID	Lead Component IDentification methodology
OC	operational condition
OEL	occupational exposure limit
OSH	occupational safety and health
PNEC	predicted no-effect concentration
REACH	Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
RCR	risk characterisation ratio
RMM	risk management measure
SCED	Specific consumer exposure determinant
SDS	safety data sheet
SPERC	specific environmental release category
SUMI	Safe Use Information for end-use Mixtures
SWED	sector-specific workers exposure description

1. Summary

Background

On **18 March 2019** a **first scoping workshop on REACH Review Action 3** took place in Brussels, co-organised by the European Commission (DG GROW, DG ENV and DG EMPL) and the European Chemicals Agency (ECHA).

Based on the outcomes, four themes for follow-up work were defined:

- Define more explicitly the information needs of companies at the bottom of the supply chain (taking also into account the views of inspection authorities);
- Work out a methodology for formulators to convert the exposure scenarios, DNELs and PNECs received for the ingredient substances into safe use information for a mixture, for communication with the safety data sheet;
- Propose minimum requirements for exposure scenarios (as such or as included into safety data sheets for mixtures) to improve the workability and usefulness of extending the safety data sheets with such information;
- Harvest information on state-of-play in the development of SDS authoring tools and define future developments needs for the IT providers.

The outcome of the follow-up work is summarised in this document, in order to initiate feedback from stakeholders. For more details, background documents will be available on the [event page](#).

In exchange with stakeholders and taking into account the findings of the various industry and authority projects, ECHA has identified 13 building blocks [tools and guiding principles] for moving towards improved workability and quality of extended safety data sheets with regard to safe use advice. These blocks are interconnected to each other, some are in place already, and other blocks need (further) development or simply broader implementation.

The overview below is meant to facilitate the discussion on the way forward, and in particular on the scope and priorities for action. Proposals for modification, addition/deletion or alternatives are welcome.

Overview on building blocks

- 1) Extending safety data sheets with exposure scenarios aims at providing users of chemicals with **use-specific advice** on preventive measures and exposure controls. The exposure scenarios complement the generic, classification-triggered advice with specific measures where quantitative exposure assessment and control is needed. This is basically foreseen by REACH ES obligations, however the scoping process has highlighted that further work is needed to implement this principle in mixture SDS generation.
- 2) Exposure scenarios still exist after inclusion into the safety data sheet for mixtures. The included exposure scenarios may be embedded in sections 7 and 8 or attached to the SDS of the mixture. Where a mixture has more than one use, or where exposure needs to be controlled by a variety of measures in the contributing activities, an **attachment to the SDS is the preferred solution**. The attachment better facilitates understanding what measures are required for which use and contributing activity. Also, if understanding is foreseen to be supported by pictograms, this needs particular data formats in an annex rather than in the core-body of the SDS.

- 3) The safe use information for end-use mixtures (SUMI) resulting from inclusion of exposure scenarios and other relevant information should be one consistent piece of information about safe use of the mixture rather than an attachment that simply compiles all the relevant exposure scenarios for the ingredient substances. ECHA and many downstream (formulating) sectors understand a **SUMI** as containing all the relevant exposure scenario information for a mixture.
- 4) The advice should be expressed in a language (supported by pictograms) understandable to those working with the chemical. It may facilitate the determination and creation of workplace safety instructions. The default **target audience is SMEs**, which often do not have the experience and means to carry out own quantitative risk assessments for deriving appropriate exposure control measures.
- 5) Companies having in place the capacity and knowledge to carry out their own assessments will benefit to a lesser extent from the safe use advice for mixtures. For this target audience, it is more important to **limit the burden of documentation** that the company's uses are addressed and that the existing control practice is in line with the ESs received (**conformity check**).
- 6) A workable system for extending the SDS for mixtures with exposure scenario information should rely on **use maps** compiled and published by downstream sector organisations. These use-maps should express the existing conditions of use for the products in question, in a form that the registrant can directly import the information into his REACH chemical safety assessment tool. In order to address the different levels of hazards a certain mixture type may have, the use-map may contain different risk management levels (bands) for the same activity. The sector organisation that develops the use map can also assign standard phrases in the **ESCom phrase library**, so that the registrant can communicate the exposure scenarios in a terminology understandable to companies in the sector and their customers.
- 7) Another important building block is the **"normalisation" of the assessment** by the registrant: The output of the use-map based assessment is the highest safe concentration of the substance(s) in the mixture under the conditions defined in the use-map. The output of the registrant's assessment is therefore neither the risk characterisation ratio (set to 1 by default) nor the conditions of use (fixed in the use-map), but the resulting safe concentration. In this way, the registrant's assessment is based on realistic conditions and provides the formulator with the key information to link the assessment outcome to the composition of the mixtures in his portfolio. Where a registrant cannot demonstrate the use map's conditions to be safe with a TIER 1 exposure (estimation) assessment, he either refines the assessment with a higher Tier assessment or communicates downstream that in his assessment the control of risk could not be demonstrated.
- 8) **CHESAR**, ECHA's tool for industries' Chemical Safety Assessment and Reporting, provides a platform for connecting the use descriptions by downstream sector organisation with the registrant's safety assessment. Chesar helps to organise the information exchange in a way that the registrants' safety assessment for substances are based on the existing use conditions for the mixtures characterised in the use maps. CHESAR enables electronic transfer of information from use maps into the registrants' assessment, and from there via the registrants SDS authorising system back to the formulating companies.
- 9) Where the formulator receives exposure scenarios that had not been derived from his sector's use map, he may be confronted with a diversity of formats, contents and phrases to be manually managed for the conformity check and the inclusion into the safety data sheet for a mixture. In order to focus efforts on the risk-driving compo-

ment(s) of his mixture, the formulator can apply the **Lead Component Identification method** (LCID). The LCID is a rule-based method for comparing the relative contribution of the hazardous ingredient substances to the overall risk in use of the mixture. Some adjustments may be needed for better taking into account ingredient substances with low system DNELs which however do not contribute to the classification of the mixture.

- 10) Where the registrant fails to demonstrate safe use under realistic conditions, or where the communication with suppliers is too burdensome, formulators may need to carry out their **own exposure quantification and risk characterisation** for the foreseen uses of the mixture, based on the hazard information in the SDS for the ingredient substances (REACH downstream user chemical safety assessment). Again, the LCID can be used to focus the assessment effort on the risk driving component(s) in the mixture.
- 11) If a mixture contains two or more substances with systemic effects at low exposure and with properties suggesting the simultaneous presence for exposure, the formulator may carry out an own **assessment addressing additivity of risk**. This can be done in a pragmatic way by running two or more Tier 1 exposure assessments in parallel and summing up the risk characterisation ratios.
- 12) Feedback from stakeholders confirms the need to define a set of **minimum requirements for exposure scenarios**, in order to synchronise the efforts towards a workable system generating quality information. In ECHA's view, such requirements should apply to the exposure scenarios as attached to the SDS for substances and to the exposure scenarios as included into the SDS for mixtures (by embedding or attaching). The minimum requirements would relate to the structure, content, phrases and IT exchange formats for exposure scenario, including the table of contents for the ES -annexes to the SDS.
- 13) To make the information generated through chemical safety assessment in the upper part of the supply chain available and useful to the users of the chemicals at the bottom of the supply chain, the **SDS authoring systems** need to be adapted. In particular, the importing and exporting of exposure scenarios via the existing **ESCom XML standard** should be enabled.

Most of the building blocks described above are available but not yet broadly implemented or properly maintained. This concerns in particular:

- SDS authoring systems at the registrant's level supporting the integration of exposure scenarios and providing the possibility **to import and export exposure scenarios in xml format**, and to ensure consistency between the main body of the SDS and the ES annex.
- Given the key role of ESCom for the functioning of the system, the **maintenance and further development of the xml exchange format** and the catalogue of standard phrases needs sufficient resourcing.
- **Utilisation and widespread implementation of available use map information** and the harmonisation of the assessment by the registrant when updating their REACH CSA and extended safety data sheet.
- The **availability of use maps** can be further increased when more DU sectors decide to adopt the use map approach, and to make information available to registrants.

For some of the building blocks additional development or maintenance work is needed.

This concerns in particular:

- **Tools for downstream users that support the conformity** check and the documenting of this check in a transparent manner. Requirements to be developed.
- **Amending the LCID tool** to better take account of substances with low derived no-effect levels (DNELs) or predicted no effect concentrations (PNECs) but which do not contribute to the classification of the mixture.
- Registrant sector organisations and consortia having based their assessment and communication so far on the *Generic Exposure Scenario* (GES) concept with full flexibility for the assessor to demonstrate control of risk may want to **adapt to the sector use map approach** and the **“normalised” assessment**.
- **Integration of assessment functions into SDS authoring systems for mixtures**, to support the selection or generation of use- and activity-specific preventive measures and exposure controls, based on a quantitative assessment, where needed. This includes selection of CSA based information prepared by suppliers or sector organisations as well as own exposure estimates and risk characterisation.

The outcome of the follow-up work from the first scoping workshop in the four areas identified (information needs, methodology for mixtures, minimum requirements for ESs, and the state-of-play of SDS authoring tools) is summarised in the following chapters, below in order to initiate feedback by stakeholders. For more details, background documents are available on the [event page](#).

On the last three pages of this document you will find a schematic workflow that connects the various building blocks.

Please note: ECHA is aware that exposure scenarios are closely interrelated with a number of the sections in the core body of the safety data sheet (SDS), including identified use (section 1.2), hazard identification (section 2), composition (section 3), as well as sections 7 and 8 (preventive measures and exposure controls), and that improvements may also be needed in this area. Focussing the present document on exposure scenarios (and the related DNEL and PNEC information) should not prevent addressing other parts of the SDS system at a later stage in the current REACH review.

2. Definition of information needs

Companies are required by law to ensure that working with chemicals will not negatively impact on the health and safety of their workers and on the environment. These duties are more concretely defined in the national implementation of the Chemicals Agent Directive and in the Industrial Emission Directive. Basically employers and site managers are obliged to have an overview on the hazardous substances (as such or in mixtures) used at the workplace (at site), know their hazard characteristics based on the information contained in the SDS, estimate the extent of exposure and environmental release that could take place, and assess whether the conditions of use control exposure and release by the right means for preventing adverse effects.

Apart from providing improved information on the hazard characteristics, REACH safety data sheets for substances and mixtures shall contain specific advice on preventive measures and exposure controls [operation conditions and risk management] per use

and contributing activity. In particular, where systemic, long-term hazards are of concern, the advice should be concrete and sufficiently differentiated for the different activities that a user may carry out with a chemical, and it should be based on exposure quantification and risk characterisation (where DNELs or OELs are available).

Larger industry companies mostly have their own means to carry out a workplace risk assessment under CAD. Thus the added value of the exposure scenario information is limited to enabling a cross-check on whether the workplace risk assessment has taken into account the DNELs generated under REACH, and the corresponding conditions of use derived in the suppliers' quantitative chemical safety assessment. For these type of companies the documentation to satisfy the obligation under REACH Article 37 (4) should add as little burden as possible (=> Requirements for such light documentation to be worked out).

Smaller companies without their own capacity for carrying out a quantitative workplace risk assessment or emission assessment, should as much as possible be able to rely on the assessment carried out by their direct supplier or further up the supply chain. Therefore, the safe use information for mixtures (or exposure scenario in the case of substances as such that are used at the bottom of the supply chain) should deliver the following:

- It should form **one piece of information** for the whole mixture (instead of single component ES) per use, providing concrete safe use advice for the single contributing activities.
- Depending on the concentration and hazard profile of the risk driving ingredients, **one or more levels [bands] of risk management** may be defined for the same type of mixture.
- Where all contributing activities can take place under the same conditions, **repetitive advice should be avoided**. The safe use information for mixtures should be very concise, usually not longer than one or two pages per use.
- The **advice should be assessment-based**, i.e. making use of DNELs, PNECs and exposure modelling tools (where no occupational exposure limit (OEL) or environmental quality standard (EQS) is available).
- The advice **should be expressed in a language** (supported by pictograms) understandable to those working with the chemical. It may facilitate the determination and creation of workplace safety instruction.
- **For the same** type of product [mixture] and **hazard profile the safe use advice should be consistent** across the various formulators selling the type of chemical.

The methodology to derive safety data sheets for mixtures and the way the registrant's CSA is connected to that, should support the information output as described above.

3. Methodology for extending the SDS for mixtures

The formulator of a mixture for end use has to check the conformity of his mixture (in terms of the foreseen uses, the substance concentrations and the anticipated use conditions) for each ingredient substance for which an exposure scenario is received. On top, he has to come up with safe use advice for the whole mixture, based on the inclusion of the relevant exposure scenarios for the substances into the SDS for the mixture, and taking into account also the hazard profile and concentration for the substances without

exposure scenarios (e.g. hazardous substances < 10 t/a). The safe use advice must be understandable and use-specific. In practice, these duties can only be fulfilled if:

- The **incoming exposure scenarios are consistent** with each other, follow a standard format and are labelled in a way that efficient identification of the information relevant for the mixture SDS is supported.
- The incoming information is already expressed (or can be easily converted) in a **terminology** that **is understandable to the users** of the mixture.

If the diversity in the incoming information is too high, the formulator will be driven into non-compliance or forced to carry out the chemical safety assessment for the hazardous substances in his mixture on his own. For many smaller formulators the required knowledge and experience needed to carry out an own safety assessment is not available.

Therefore ECHA believes that the sector use map approach and the corresponding SUMI selection method, as developed under ENES, is the preferable way to go.

3.1. Downstream sector use maps approach

In order to connect the registrant's CSA with the safe use advice arriving at the bottom of the supply chain, the registrant's chemical safety assessors need to receive realistic information on the existing conditions of use for their substances in the market, in a format that can be directly entered into their chemical safety assessment tools. In his assessment, the registrant can determine the highest concentration or amount of the substance that can be safely used under the existing conditions of use as documented in the use map.

The sets of conditions per contributing activity are called SWEDs, SPERCs and SCEDs¹. Each of them is labelled with a unique code. Use map developers can use CHESAR, ECHA's tool for Chemical Safety Assessment and Reporting, to generate their use map in a structured, harmonised format. The use maps are published for download on ECHA's [use map library](#). The currently published use maps of 10 sectors focus on uses outside the chemical manufacturing industry and cover a significant part of the market.

The ECom catalogue provides standard phrases for exposure scenario content. Downstream sectors associate these phrases to the use names, the contributing activity names and to the conditions of use. They are meant to be used accordingly by the registrant when compiling their exposure scenarios to be attached to the SDS for the substance. The phrases used across different sectors can be harmonised by incorporating them into the ECom catalogue. ECom has been set up and is maintained by a Cefic-led working group representing manufacturers and downstream users of chemicals, ECHA and providers of IT solutions for SDS authoring. The phrases are freely available [online](#).

3.2. Safe use information for mixtures

To facilitate the inclusion of the substance exposure scenarios into the safety data sheet for a mixture by the formulator, downstream sectors have set up libraries for safe use of

¹ Sector-specific worker exposure determinants (SWED), Specific environmental release categories (SPERC), Specific consumer exposure determinants (SCED).

mixtures information (SUMI), to be annexed to be the SDS for a mixture. The SUMIs have a standard layout, are expressed in simple-to-understand language and are supported by pictograms. The content is similar to what is defined in the corresponding SWEDs.

Independent of the composition of the single products, the formulator can map his portfolio to the SWEDs and SUMIs that are likely to cover the activities with his products. Depending on the variety in the hazard level of the mixture, one or more SUMIs may be applicable. The formulator will select the right SUMI(s) for a given mixture, depending on the mixture composition and on the information he receives with the exposure scenario from his supplier.

3.3. Inclusion of exposure scenario information from other sources

Exposure scenarios that are not linked to use map information and SUMIs require manual processing at the formulator's level, as the safe use information for the mixture needs to be generated directly from the exposure scenarios received.

In a first step, the formulator needs to confirm that the exposure scenarios received cover the foreseen use of the substance in the mixture (=> requirements for a conformity check tool still to be developed). Otherwise the formulator will need to carry out his own DU chemical safety assessment.

To focus on the exposure scenarios of the ingredient substances driving the risk when using the mixture, the Lead Component Identification method (LCID) can be used. Please note: At present the LCID algorithm disregards all substances not contributing to the classification of the mixture, even when having a low DNEL. Some refinement of the LCID ruleset may be needed therefore.

If the lead components per route of exposure have been identified, the information from the exposure scenario(s) is included into the safe use advice for the mixture. If more than one lead component has been identified, the ES information is to be consolidated in a manual process. Documentation of the methodology is available on the [VCI website](#).

3.4. Safety assessment across two or more substances

If a mixture contains two or more substances with systemic effects at low exposure ($DNEL < xyz \text{ mg/m}^3$)² and with properties suggesting the simultaneous presence for exposure by the same route, the formulator should carry out an own assessment addressing the additivity of the risk. This is basically running two or more parallel assessments of the ECETOC TRA-type exposure assessment³ and summing up the risk characterisation ratios (RCRs). If this leads to an RCR clearly greater than one, the formulator may need to refine the exposure assessment or include additional advice on exposure controls into the mixture SDS, or carry out a toxicological assessment to exclude additivity of effects.

² Benchmark potentially to be worked out

³ Targeted Risk Assessment: Tier 1 worker exposure estimation tool, used for 80% to 90% of all REACH assessments.

4. Minimum requirements for exposure scenarios

Feedback from stakeholders confirms the need to define a set of **minimum requirements for exposure scenarios**, in order to synchronise the efforts towards a workable system generating quality information. The minimum requirements should refer to the content, the table of contents supporting navigation through larger ES annexes, the use of standard phrases and to an electronic exchange format (such as xml). On the content side, the proposal starts from Annex I and Annex II of the REACH Regulation where all the relevant elements that form the content of an ES are mentioned.

The proposals outlined in the table below applies a combined terminology from REACH Annex I and Annex II. Basically the terms “preventive measures” and “exposure controls” from REACH Annex II have the same meaning as “operational conditions (OC)” and “risk management measures (RMM)”. The main difference however is that:

- The current safety data sheet Sections 7/8 are populated with generic advice; while
- the OC/RMM in the exposure scenarios result from use/activity-specific assessment.

Therefore, the information in the titles of the exposure scenarios and in the names of the contributing activities are essential, and thus part of the minimum requirements. The titles/names are the key information for the recipient to determine which safe use advice is relevant for his uses/activities.

Where the conditions of safe use are similar across different activities or uses, the safe use advice should not be repeated. However the exposure scenario should be unambiguous on which preventive measures or exposure control measures apply to which activity with the substance or mixture.

The conditions of use driving the exposure, and therefore to be addressed in the exposure scenario as a minimum, have been determined from the tools the registrants have used most frequently for the REACH exposure assessment, as the lowest common denominator. Thus the minimum requirements reflect the basic assessment practice under REACH applied by the vast majority of registrants.

Table 1: Minimum information in a worker exposure scenario (occupational part)

Use	Required information element	Title elements and conditions of use to be addressed (if relevant to control exposure)	Values
	Exposure Scenario Title	<ul style="list-style-type: none"> Life cycle stage* Product type or category* Other information to specify the use (if relevant) 	
	Contributing Scenario Title	<ul style="list-style-type: none"> Contributing activity name* Activity or process category* SWED reference 	
	Operational conditions to which precautions and controls apply	<ul style="list-style-type: none"> Physical form of chemical Level of dustiness (for solids) Duration of exposure per day Temperature of operation Place of use: Indoor or outdoor 	
	Precautions for safe handling	<ul style="list-style-type: none"> Degree/type of containment Prevention of dust and aerosols 	
	Engineering controls	<ul style="list-style-type: none"> Extent of general room ventilation Flow booth or spray room required? Specify local exhaust ventilation 	
	Personal Protective Equipment	<ul style="list-style-type: none"> Eye and face protection Hand protection Other skin protection Respiratory protection 	
	[Other condition of use]		
	Highest safe concentration under the conditions of use described	CONCsafe =	
	Exposure estimates and RCR	<ul style="list-style-type: none"> 8h average inhalation (daily)* 8h dermal dose (daily)* 15 min peak inhalation 	
	Exposure estimation method applied		
	Contributing Scenario Title		
		

The required information element should always be present in an exposure scenario. The title information labelled with (*) should always be provided.

If the core conditions of use related to one of the required information elements are not relevant to control exposure (as determined in a REACH CSA) the exposure scenario should display the information as “not relevant” for that particular information element. Further explanation on the requirements and the possible values/advice that can be entered per condition of use can be found [event page](#).

Table 2: Minimum information required in worker exposure scenario (environment part)⁴

Use	Required information element	Title elements and conditions of use to be addressed (if relevant to control exposure)	Values
	Exposure Scenario Title	<ul style="list-style-type: none"> Life cycle stage* Product type or category* Other information to specify the use (if relevant) 	
	Contributing Scenario Title	<ul style="list-style-type: none"> Contributing activity name* Environmental Release Category * SPERC reference 	
	Operational conditions to which precautions and controls apply	<ul style="list-style-type: none"> Extent of water contact 	
	Precautions for safe handling	<ul style="list-style-type: none"> Degree/type of containment; closed system; 	
	Engineering controls	<ul style="list-style-type: none"> Exhaust gas treatment (effectiveness and suitable technique) Onsite waste water treatment (effectiveness and suitable technique) Baths and other water-based residues to be disposed off as waste; 	
	[Other condition of use		
	Emission factors (fraction from used amount assumed to be emitted from site	<ul style="list-style-type: none"> % to air % to water % to waste 	
	Highest safe amount per site under the conditions of use described.	Msafe =	
	Exposure estimates and RCR	<ul style="list-style-type: none"> Daily average PEC 	
	Exposure estimation method applied		
	Contributing Scenario Title		
		

5. Development of extended SDS authoring systems

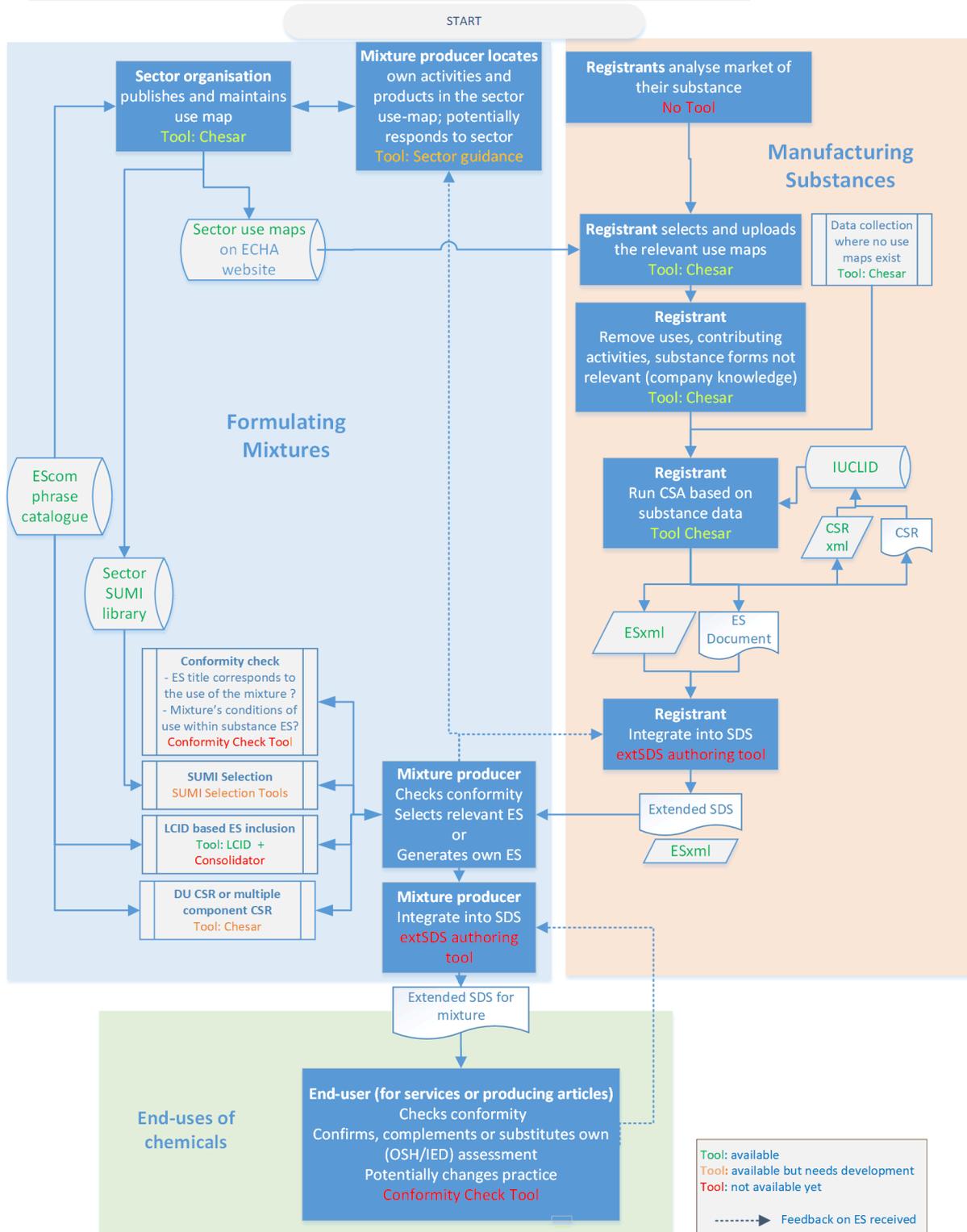
Most of the current SDS authoring systems are not equipped for importing exposure scenario information in an electronic format from chemical safety assessment tools like CHESAR, nor are they capable of IT-processing and then exporting the relevant information to the next level in the supply chain. Nevertheless, industry has developed an xml exchange standard, based on which such a transfer could be possible. ECHA and the various stakeholders having contributed to the scoping phase of Action 3 believe that electronic exchange (import, processing and export) of information is crucial for the efficient management of exposure scenario communication. Some software providers have developed prototypes, however industries' investment is limited so far.

In addition, authoring tools could be equipped with [link to] functions to support the required assessment operations at formulators' level, such as: selecting, or where needed generating the appropriate risk management advice for the mixture. This could include quantifying expected exposure, and characterising the corresponding risk, as this may be needed on a case- by-case basis.

⁴ For each of the conditions of use in column 3, a number of default values (with assigned standard phrases for communication) could be described in column 4.

6. Workflow for risk communication in the supply chain

Workflow: Risk management communication through the supply chain for REACH registered substances (based on ENES Tool Set)



Annex: Glossary for the Workflow

Tool	What is it	Status	Origin/owner
Chesar	Chemical Safety Assessment and Reporting Tool provided by ECHA to industry. Can be used by registrant's assessor for the safety assessment of a substance, or by sector organisations to make use maps available to registrants in electronic format. With a few adaptation the tool could also support downstream users in future for making safety assessments for mixtures.	available, maintained	ECHA
Conformity check tool	Tool supporting downstream users in checking that their uses, the contributing activities and the conditions of use are covered by the exposure scenarios received. For formulators this means, whether the exposure scenario title matches the type of mixture they produce, and whether the anticipated uses of the mixture are in line with contributing scenarios and the related conditions described in the exposure scenario.	Common tool not available.	
CSRxml	CSR exchange format for import/exports from IUCLID and Chesar	available, maintained	ECHA
ESCom phrase catalogue	The Catalogue of phrases for expressing the titles and the content of exposure scenarios. The library is based on the principle that the number of phrases to express operational conditions and risk management measures should be limited (avoid duplicates in expressing the same content as far as possible). At the same time the library supports sector specific phrases for product types and contributing activities (facilitates recognition of relevant ES contents by the recipients of the information).	available, maintained	Industry ESCom group managed by Cefic
ESxml	Exposure scenario exchange format to support electronic transfer of exposure scenarios: From the Chemical Safety Assessment tool into the companies' SDS authoring tool, and from there further down the supply chain to the distributors/formulators SDS authoring tools.	available, maintained	Industry ESCom group managed by Cefic
extSDS authoring	Safety data sheet authoring tools capable to <ol style="list-style-type: none"> electronically import, process and export exposure scenarios and DNELs/PNECs and carry out [link to] the required assessment operations at formulator's level to select or where needed generate the appropriate risk management advice for the mixture 	Common tool not available; scattered initiatives by single actors;	Industry companies and their authoring tool providers
IUCLID	I nternational U niform C hemical I nformation D atabase is a software to capture, store, maintain and exchange data on intrinsic and hazard properties of chemical substances		ECHA
LCID	The L ead C omponent I dentification method compares the risks resulting from the different hazardous ingredient substances in a mixture. It identifies the ingredient substances leading the risk on relevant exposure routes. The exposure scenarios of the lead components are expected to ensure safe use for all the ingredients in the mixture.	Available, maintained	VCI
LCID consolidator	If more than one exposure scenario of the ingredient substances has to be included into the SDS of a mixture for end-use, the information from 2 or more ES needs to be consolidated (no duplication, no inconsistencies). On top consistencies need to be ensured between the information from the included ES and the information in section 7 and 8 of the SDS.	Common rule set (and tool) not available.	
Sector SUMI library	S afe U se of M ixture I nformation (for end-use mixtures) is the analogue to an exposure scenario for a substance. In describes the conditions of safe use for the whole mixture, per use and per contributing activity. The SUMI layout and language is particular meant to be understood by SME end-users. Some downstream sectors provide SUMI libraries as a complement to the use-maps. Based on received exposure scenarios or own assessment formulators can select the SUMI matching their type and hazard profile of mixture.	available, maintained; limited market coverage;	Sectors having generated use-maps

Tool	What is it	Status	Origin/owner
Sector Use map	Systematic inventory of uses, contributing activities and related conditions of use for a category of mixture ⁵ (for example coatings, cleaners, lubricants, plastic compounds, fuels).	available, maintained; limited market coverage	Sector organisations based on ENES harmonised format
SUMI selection Tool	The SUMIs are systematically linked to use maps. If the registrants of the ingredients substances of a mixture have based their exposure scenarios on use-map information, the formulating company can run a rule set (tool) to identify the appropriate SUMI for a mixture composition.	No common tool available; scattered initiatives by single actors;	Sectors having generated use-maps

⁵ Note: End-users of chemicals outside the chemical industry (industry or service companies) usually work with mixtures, i.e. the products they purchase contain various substances. This however also includes the more rare case of products containing only one substance (pure or diluted with water).