



**CEPE**

## Chemical Safety Assessment Using Sector Specific “Use Maps”

86<sup>th</sup> LCA Discussion Forum SSbD

25 April 2024

# About CEPE



**+/- 800 companies €13 billion / year**

**85 printing inks €3 billion / year**

**20 artist colours €0.3 billion /year**

**20 National Associations**

**110,000 direct jobs  
85% of total market**

**Millions of users and businesses need our products**



# Speaker introduction



**Dr. Shufan Keetlaer-Qi**

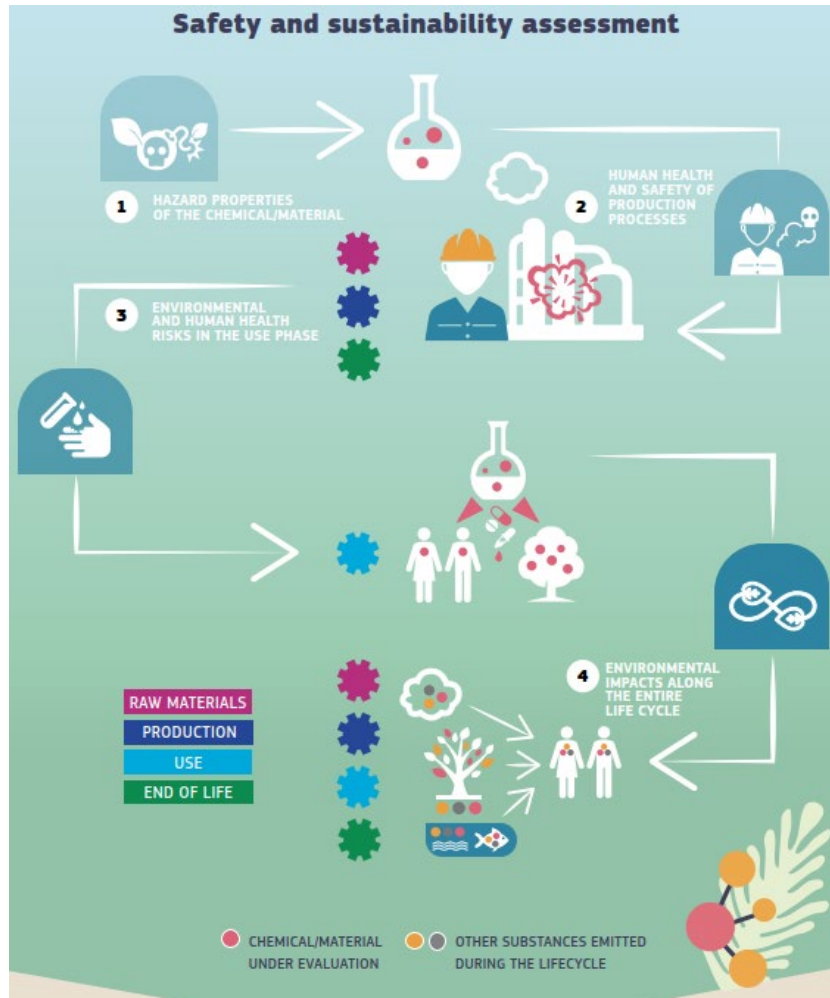
*Human Toxicologist and Risk Assessor*

*Chair of CEPE ESRAG (Exposure Scenario Risk Assessment Group)*

*Global Manager Product Safety*

**AkzoNobel**

# Chemical safety/risk assessment in SSbD



The SSbD assessment composed of four steps:

**Step 1** – Hazard assessment of the chemical/material

**Step 2** – Human health and safety aspects in the chemical/material production and processing phase

**Step 3** – Human health and environmental aspects in the final application phase

**Step 4** – Environmental sustainability assessment



# Chemical Risk Assessment

Risk assessments are used to identify and evaluate the **likelihood** of adverse effects which may arise from exposure to a chemical



$$\text{RISK} = \text{HAZARD} \times \text{EXPOSURE}$$

# Human health hazard

A health hazard is a potential source of danger to a person's health; a negative health effect



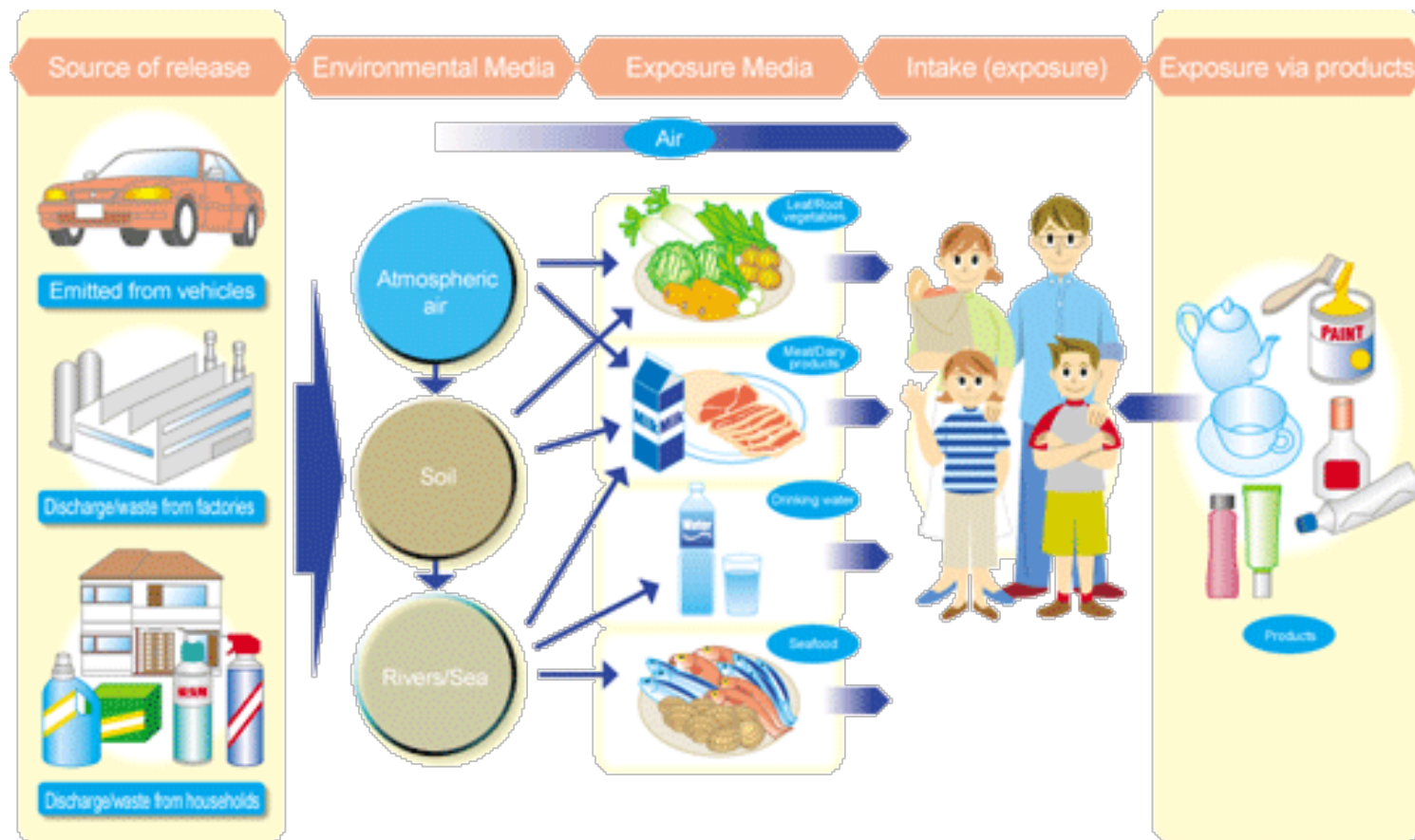
Classification



# Exposure

Exposure is a way how a person can come into contact with chemicals

Exposed population	Exposure routes
Workers	Dermal & inhalation
General population	Oral, dermal & inhalation





# Examples of exposure to paint and coating products



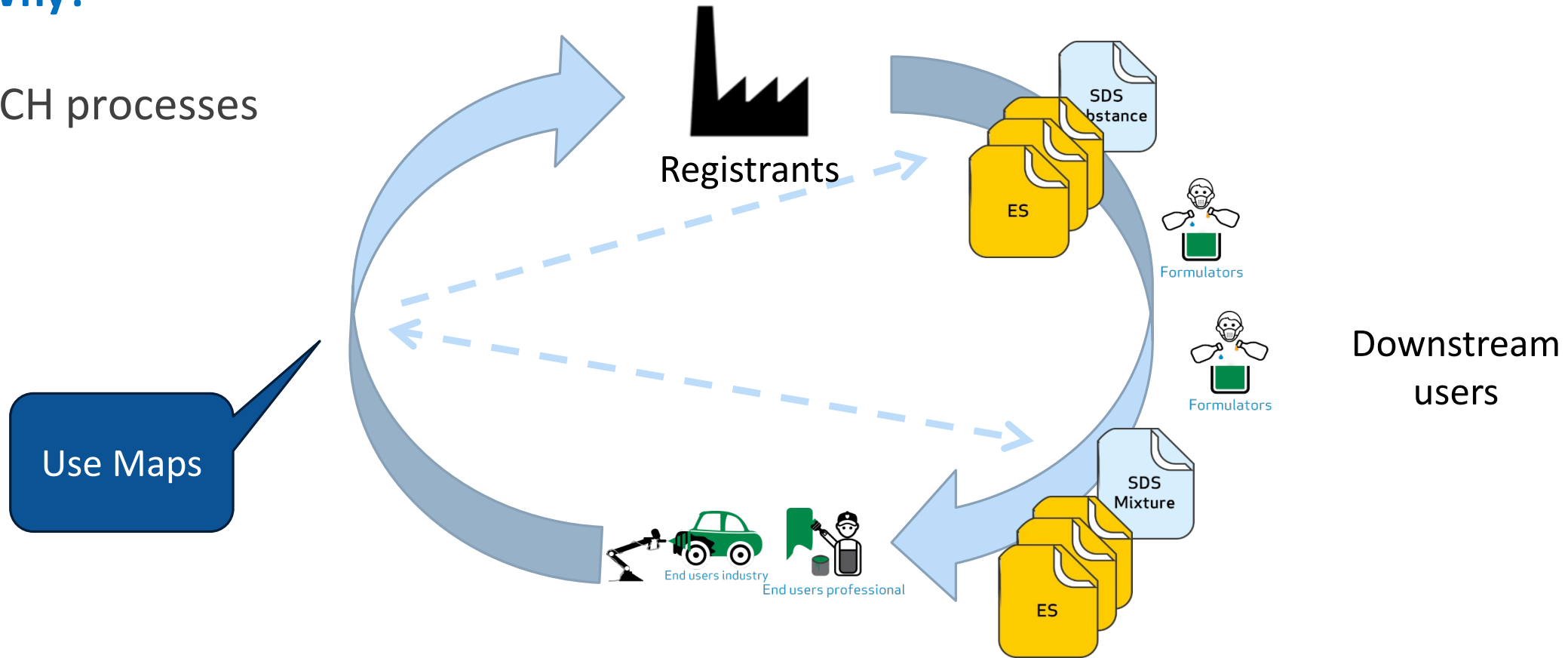
Would it be useful to develop as set of use conditions covering all paints and coatings industry?



# Use maps (1)

## Use maps - Why?

... key to REACH processes



# Use maps (2)

## Use maps – What?

Pre-defined, **standardized** sets of information containing the **relevant Operational Conditions & Risk Management Measures** for the majority of uses of the mixtures that are **relevant for the sector**

Use	Product category	Code condition for SWEDs	Product category	Code condition for SWEDs
1	Water based	Water based	Water based	Water based
1.1	Water based	Water based	Water based	Water based
1.2	Water based	Water based	Water based	Water based
1.3	Water based	Water based	Water based	Water based
1.4	Water based	Water based	Water based	Water based
1.5	Water based	Water based	Water based	Water based
1.6	Water based	Water based	Water based	Water based
1.7	Water based	Water based	Water based	Water based
1.8	Water based	Water based	Water based	Water based
1.9	Water based	Water based	Water based	Water based
1.10	Water based	Water based	Water based	Water based
1.11	Water based	Water based	Water based	Water based
1.12	Water based	Water based	Water based	Water based
1.13	Water based	Water based	Water based	Water based
1.14	Water based	Water based	Water based	Water based
1.15	Water based	Water based	Water based	Water based
1.16	Water based	Water based	Water based	Water based
1.17	Water based	Water based	Water based	Water based
1.18	Water based	Water based	Water based	Water based
1.19	Water based	Water based	Water based	Water based
1.20	Water based	Water based	Water based	Water based
1.21	Water based	Water based	Water based	Water based
1.22	Water based	Water based	Water based	Water based
1.23	Water based	Water based	Water based	Water based
1.24	Water based	Water based	Water based	Water based
1.25	Water based	Water based	Water based	Water based
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1.31	Water based	Water based	Water based	Water based
1.32	Water based	Water based	Water based	Water based
1.33	Water based	Water based	Water based	Water based
1.34	Water based	Water based	Water based	Water based
1.35	Water based	Water based	Water based	Water based
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1.43	Water based	Water based	Water based	Water based
1.44	Water based	Water based	Water based	Water based
1.45	Water based	Water based	Water based	Water based
1.46	Water based	Water based	Water based	Water based
1.47	Water based	Water based	Water based	Water based
1.48	Water based	Water based	Water based	Water based
1.49	Water based	Water based	Water based	Water based
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1.59	Water based	Water based	Water based	Water based
1.60	Water based	Water based	Water based	Water based
1.61	Water based	Water based	Water based	Water based
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1.66	Water based	Water based	Water based	Water based
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1.68	Water based	Water based	Water based	Water based
1.69	Water based	Water based	Water based	Water based
1.70	Water based	Water based	Water based	Water based
1.71	Water based	Water based	Water based	Water based
1.72	Water based	Water based	Water based	Water based
1.73	Water based	Water based	Water based	Water based
1.74	Water based	Water based	Water based	Water based
1.75	Water based	Water based	Water based	Water based
1.76	Water based	Water based	Water based	Water based
1.77	Water based	Water based	Water based	Water based
1.78	Water based	Water based	Water based	Water based
1.79	Water based	Water based	Water based	Water based
1.80	Water based	Water based	Water based	Water based
1.81	Water based	Water based	Water based	Water based
1.82	Water based	Water based	Water based	Water based
1.83	Water based	Water based	Water based	Water based
1.84	Water based	Water based	Water based	Water based
1.85	Water based	Water based	Water based	Water based
1.86	Water based	Water based	Water based	Water based
1.87	Water based	Water based	Water based	Water based
1.88	Water based	Water based	Water based	Water based
1.89	Water based	Water based	Water based	Water based
1.90	Water based	Water based	Water based	Water based
1.91	Water based	Water based	Water based	Water based
1.92	Water based	Water based	Water based	Water based
1.93	Water based	Water based	Water based	Water based
1.94	Water based	Water based	Water based	Water based
1.95	Water based	Water based	Water based	Water based
1.96	Water based	Water based	Water based	Water based
1.97	Water based	Water based	Water based	Water based
1.98	Water based	Water based	Water based	Water based
1.99	Water based	Water based	Water based	Water based
1.100	Water based	Water based	Water based	Water based

**SWEDs**  
(Specific Worker Exposure Descriptions)

Exposure Determinants or Descriptors	Value and [ESCOM phrase Code]
<b>SCED characteristics</b>	
Name of the SCEDs	Title from each association
PC/AC descriptor	PC/AC number
SCED code	Factor=SCED=PC / AC Code=number+letter+version
Code of other related SCED	Factor=SCED=PC / AC Code=number+letter+version
Author	Association name
Source of SCED	Association website where the SCED can be found
Physical form of the products	Choose an item.
<b>User characteristics</b>	
Adult/child assumed	Product used by adult (defaults based upon adult exposure factors)
<b>Common Determinants</b>	
Concentration of substance in mixture [g/g]	Numerical (Default maximum 1)
Explanations	(Substance specific information)
Frequency of use over a day (event/day)	Numerical
Rationale	Free text
Frequency of use over a year	Choose an item.
Rationale	Free text
<b>Dermal Specific Determinants</b>	
Exposure via dermal route	Choose an item.
Rationale	Free text
Skin Contact Area	Choose an item.
Rationale	Free text
Dermal transfer factor	Numerical - (default 1)
Rationale	Free text
<b>Inhalation Specific Determinants</b>	
Exposure via inhalation route	Choose an item.
Rationale	Free text
Spray application?	Choose an item.

**SCEDs**  
(Specific Consumer Exposure Determinants)

SPERC	Value and [ESCOM phrase Code]
<b>SPERC characteristics</b>	
Name of the SPERCs	Title from each association
PC/AC descriptor	PC/AC number
SPERC code	Factor=SPERC=PC / AC Code=number+letter+version
Code of other related SPERC	Factor=SPERC=PC / AC Code=number+letter+version
Author	Association name
Source of SPERC	Association website where the SPERC can be found
Physical form of the products	Choose an item.
<b>User characteristics</b>	
Adult/child assumed	Product used by adult (defaults based upon adult exposure factors)
<b>Common Determinants</b>	
Concentration of substance in mixture [g/g]	Numerical (Default maximum 1)
Explanations	(Substance specific information)
Frequency of use over a day (event/day)	Numerical
Rationale	Free text
Frequency of use over a year	Choose an item.
Rationale	Free text
<b>Dermal Specific Determinants</b>	
Exposure via dermal route	Choose an item.
Rationale	Free text
Skin Contact Area	Choose an item.
Rationale	Free text
Dermal transfer factor	Numerical - (default 1)
Rationale	Free text
<b>Inhalation Specific Determinants</b>	
Exposure via inhalation route	Choose an item.
Rationale	Free text
Spray application?	Choose an item.

**SpERCs**  
(Specific Environmental Release Categories)

# Use maps (3)



## Example of a CEPE SWED

Field No.	Field name	CEPE SWED 1
		Field content
<b>1</b>	<b>SWED identifiers</b>	
1.1	SWED title	Industrial (Spray and non-Spray) Painting, Liquid - Enhanced Room Ventilation
1.2	SWED code	CEPE_SWED_IS_Pr5_c_liq
1.3	Short description of process/activity covered	Painting process activities requiring enhanced ventilation, eye and dermal controls
<b>1.6</b>	<b>Relevant contributing activity</b>	
1.6.1	Contributing activity/name	Preparation of material for application; Cleaning
1.6.2	Corresponding PROC	PROC 5
<b>2</b>	<b>Core conditions of use</b>	
2.1	Percentage (w/w) of substance in mixture	<= 100 %
2.2	Physical form of the used product	Liquid, including paste/slurry/suspension
2.3	Duration of activity	≤8 h/day
2.4	Occupational health and safety management system	Advanced
2.5	Room Ventilation	Enhanced (5 to 10 ACH)
2.6	Local Exhaust Ventilation (LEV)	No
2.7	Use of Respiratory Protection Equipment (RPE)	No
2.8	Use of gloves & other dermal protection	Chemical resistant dermal protection with basic employee training. Effectiveness ≥ 90%.
2.9	Use of eye/ face protection	Goggles
2.10	Place of use	Indoors
2.11	Operating temperature (°C)	40 °C
2.11.1	Details on operating temperature	Explanation for the CSR:ambient temperature
<b>3</b>	<b>Description of other conditions of use, if relevant for specified exposure assessment tool</b>	
<b>4</b>	<b>Rigorous containment</b>	
4.1	Rigorously contained system	No
4.2	Description of non-technical means for rigorous containment and strict control for manual intervention.	
<b>5</b>	<b>Measured data available</b>	
<b>6</b>	<b>Additional good practice advice</b>	



# Use maps (4)



## Use maps – by whom?

Sector associations → have the knowledge on the way their products are used within the sector

## Use maps – for whom ?

Registrants → input for the Chemical Safety Assessment  
Formulators → internal mapping of uses

# Use maps (5)



## Use maps – Where? <https://echa.europa.eu/csr-es-roadmap/use-maps/use-maps-library>

ECHA > Legislation > REACH > Registration > Information requirements > Chemical safety report > Chemical safety report/Exposure scenario roadmap > Use maps > Use maps Library

### Information requirements

Chemical safety report

## Use maps

Concept   **Templates and submission**   Use maps library

This library includes the use description and the input parameters for workers exposure assessment (SWEDs), for consumers exposure assessment (SCEDs) and for environmental exposure assessment (SPERCs), made available by sector organisations for their typical uses.

The information aims at supporting registrants in preparing their chemical safety assessments (CSAs). Registrants will find here the use description for key typical products, as agreed at sector level, as well as the associated conditions of use. This provides a realistic basis for their chemical safety assessment.

To stay informed about new submissions to the library or updates, please subscribe to **ECHA Weekly**.

The library is structured by sector and product. Clicking on a sector name below will give you access to the following information:

- Background information on the use map coverage
- Direct access to use map files, including Chesar files when available.

Industry sector associations and ECHA encourage you to **provide feedback!** Click [here](#) to access a short questionnaire. The feedback received will be used to improve our use map library and to gain insight into how the use maps are being used and how they could be further developed to meet your needs.

### See also

- Harmonised set of conditions of use [PDF]
- Video-tutorial: How to import and use a use map in Chesar 3
- Video-tutorial: How to update a use map in Chesar 3
- Joint statement of Cefic, DUCC and ECHA on use maps
- Downstream users
- CSR/ES roadmap
- How to improve your dossier

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> **AISE**  
International Association for Soaps, Detergents and Maintenance Products

> **CEPE**  
European Council of the Paint, Printing Ink and Artists' Colours Industry

> **CLE**  
CropLife Europe

> **Concawe**  
Fuels

> **Cosmetics Europe**  
Cosmetics and personal care products

> **EFCC**  
European Federation for Construction Chemicals

> **ESIG**  
European Solvents Industry Group

> **EuPC**  
European Plastics Converters

> **FEICA**  
Association of the European Adhesive and Sealant Industry

> **Fertilizers Europe**  
Fertilizers Europe

> **I&P Europe / I&P Europe Imaging and printing products**  
I&P Europe

> **IFRA**  
International Fragrance Association

# A CEPE example on SSbD Step 3 assessment

Substance X is an additive a paint product at low levels.

A supplier is offering a new additive (Y) with an improved technical performance and claims that Y has better classifications.

Conducting Step 3 on human health for uses of X and Y in a DIY interior trim paint product





# Input information on substances

	<b>Name</b>	<b>X</b>	<b>Y</b>
<b>Substance</b>		(Harmonised) Skin Sens. 1 H317 STOT SE 1 H370 (inhalation)	(Self-classification) Skin Irr. H315 Eye Irr. H320
	<b>Classification</b>		
	<b>Molecular weight (g/mol)</b>	107	96
	<b>Log Kow</b>	0.7	0.9
	<b>Vapour Pressure</b>	2.02 kPa	925 Pa
	<b>Volum registered under REACH</b>	> 1000 tonnes/year	100-1000 tonnes
<b>Product</b>	<b>Name</b>	Interior trim paint	Interior trim paint
	<b>Weight fractionsubstance (%)</b>	0.5%	0.3%
<b>Population</b>	<b>Name</b>	general	general
	<b>Body weight (Kg)</b>	60	60
<b>Hazard assessment (General Population)</b>	<b>Inhalation - long term DNEL (mg/m3)</b>	83.76	1.42
	<b>Available study based on</b>	Two-year inhalation study of carcinogenicity and chronic toxicity	Sub-acute toxicity study (dermal)
	<b>Dermal - long term DNEL (mg/kg bw/d)</b>	10.53	8.15
	<b>Available study based on</b>	Chronic toxicity study (dermal)	Sub-acute toxicity study (dermal)

# Input information on use scenario

<https://echa.europa.eu/csr-es-roadmap/use-maps/use-maps-library>

## CEPE Specific Consumer Exposure Determinants (“SCEDs”)

SCEDs have been developed by downstream user sector organisations under Action Area 2.5 of the ECHA CSR/ES Roadmap. They form part of the use maps concept, to facilitate improved communication upstream to registrants about the uses of formulated chemical products (mixtures).

The purpose of SCEDs is to provide more realistic information on the uses of mixtures by **consumers** and the resulting exposures, which can be used in Chemical Safety Assessments for substances either by registrants or by downstream users. SCEDs can be used as input information for Tier 1 models, such as ECETOC TRA, or for higher-tier models as appropriate (e.g. ConsExpo).

### CEPE SCEDs for DIY painting

CEPE has developed a set of SCED factsheets for do-it-yourself painting and related tasks. The data in these factsheets, where they deviate from standard default values, are based on the results of a study of consumer painting habits and practices commissioned by CEPE. This survey was conducted between March and May 2015 and included 7542 respondents in 15 EU Member States (selected to represent 92% of the EU population). An independent statistical analysis of the survey data was commissioned to derive robust percentile values for use in the SCEDs. The survey results are not published openly, but CEPE remains at the disposal of authorities for dialogue about the basis for these SCEDs.

The full set currently comprises the following SCED factsheets (*see individual SCEDs for version details*):

<a href="#">CEPE SCED 9a 01</a>	Interior wall paints – roller/brush
<a href="#">CEPE SCED 9a 02</a>	Exterior wall paints – roller/brush
<a href="#">CEPE SCED 9a 03</a>	Interior trim paints – roller/brush
<a href="#">CEPE SCED 9a 04</a>	Exterior trim paints – roller/brush
<a href="#">CEPE SCED 9a 05</a>	Interior spray paints – aerosol
<a href="#">CEPE SCED 9a 06</a>	Exterior spray paints – aerosol
<a href="#">CEPE SCED 9a 07</a>	Interior removers – roller/brush
<a href="#">CEPE SCED 9a 08</a>	Exterior removers – roller/brush
<a href="#">CEPE SCED 9b 09</a>	Fillers and putties (indoor)
<a href="#">CEPE SCED 9b 10</a>	Plasters and floor equalisers (indoor)



## CEPE Specific Consumer Exposure Determinants (“SCEDs”)

### Products/activities covered by the SCED:

Trim paints (water-based/solvent-based/high solids) – indoor application by roller or brush (doors, window frames etc.).

### Applicability of the SCED (depending on substances properties):

All substances used in consumer paints marketed for the above purpose.



Exposure Determinants or Descriptors	Value <sup>5</sup> and [ESCOM phrase Code] <sup>6</sup>
<b>SCED characteristics</b>	
<b>Name of the SCEDs</b>	Interior trim paints – roller/brush
<b>PC/AC descriptor</b>	PC9a
<b>SCED code</b>	CEPE_SCED_9a_03_v1
<b>Code of other related SCED</b>	n.a.
<b>Author</b>	CEPE
<b>Source of SCED</b>	<a href="http://www.cepe.org">www.cepe.org</a>
<b>Physical form of the products</b>	Liquids
<b>User characteristics</b>	
<b>Adult/child assumed</b>	Product used by adult (defaults based upon adult exposure factors)
<b>Common Determinants</b>	
<b>Concentration of substance in mixture (g/g)</b>	0.5 (solvent/carrier) 0.3 (other substances)
<b>Explanations</b>	CEPE suggested defaults, to be used only in absence of more specific information about substance concentration in product.
<b>Frequency of use over a day (event/day)</b>	Once per day
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Frequency of use over a year (days/year)</b>	7
<b>Rationale</b>	CEPE consumer painting survey 2015; 90 <sup>th</sup> percentile for relevant job type. ECHA Guidance on Information Requirements and Chemical Safety Assessment Chapter R.15: Consumer Exposure Assessment defines infrequent use as <15 days per year.
<b>Dermal Specific Determinants</b>	
<b>Exposure via dermal route</b>	Yes
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Skin Contact Area</b>	Inside of 2 hands/ palm of 2 hands / One hand

Exposure Determinants or Descriptors	Value <sup>5</sup> and [ESCOM phrase Code] <sup>6</sup>
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Dermal transfer factor</b>	1
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Inhalation Specific Determinants</b>	
<b>Exposure via inhalation route</b>	Yes
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Spray application?</b>	No
<b>Amount of Product used per application (g/event)</b>	1300g
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Exposure Time per event (h)</b>	7
<b>Rationale</b>	CEPE consumer painting survey 2015 (90 <sup>th</sup> percentile); includes exposure time whilst not actually painting
<b>Inhalation transfer factor</b>	1
<b>Rationale</b>	Unchanged from ECETOC TRA default value
<b>Place of use</b>	Indoor
<b>Oral Specific Determinants</b>	
<b>Exposure via oral route</b>	Oral exposure not foreseen
<b>Rationale</b>	Negligible hand-to-mouth transfer can be assumed for adult users – hand washing is normal before eating, smoking etc.
<b>Volume swallowed (cm<sup>3</sup>)</b>	Not applicable
<b>Rationale</b>	Not applicable
<b>Oral transfer Factor</b>	Not applicable
<b>Rationale</b>	Not applicable



# Exposure estimation in ConsExpo

## Substance X

Output scenario Application			
Results	Graphs	Sensitivity analysis	Exposure fractions
<b>Inhalation</b>			
Exposure model	Exposure to vapour - Evaporation		
Mean event concentration	$6.0 \times 10^1$	mg/m <sup>3</sup>	
Peak concentration (TWA 15 min)	$8.6 \times 10^1$	mg/m <sup>3</sup>	
Mean concentration on day of exposure	5.5	mg/m <sup>3</sup>	
Year average concentration	$1.0 \times 10^{-1}$	mg/m <sup>3</sup>	
External event dose	3.0	mg/kg bw	
External dose on day of exposure	3.0	mg/kg bw	
<b>Dermal</b>			
Exposure model	Direct product contact - Constant rate		
Dermal load	$4.2 \times 10^{-2}$	mg/cm <sup>2</sup>	
External event dose	$3.0 \times 10^{-1}$	mg/kg bw	
External dose on day of exposure	$3.0 \times 10^{-1}$	mg/kg bw	

## Substance Y

Output scenario Application			
Results	Graphs	Sensitivity analysis	Exposure fractions
<b>Inhalation</b>			
Exposure model	Exposure to vapour - Evaporation		
Mean event concentration	$2.3 \times 10^1$	mg/m <sup>3</sup>	
Peak concentration (TWA 15 min)	$3.3 \times 10^1$	mg/m <sup>3</sup>	
Mean concentration on day of exposure	2.1	mg/m <sup>3</sup>	
Year average concentration	$4.0 \times 10^{-2}$	mg/m <sup>3</sup>	
External event dose	1.1	mg/kg bw	
External dose on day of exposure	1.1	mg/kg bw	
<b>Dermal</b>			
Exposure model	Direct product contact - Constant rate		
Dermal load	$2.5 \times 10^{-2}$	mg/cm <sup>2</sup>	
External event dose	$1.8 \times 10^{-1}$	mg/kg bw	
External dose on day of exposure	$1.8 \times 10^{-1}$	mg/kg bw	

# Assessment results

Substance Y fails SSbD step 3 assessment

	X	Y
<b>Inhalation exposure (mg/m<sup>3</sup>)</b>	5.5	2.1
<b>Inhalation DNEL (mg/m<sup>3</sup>)</b>	83.76	1.42
<b>Inhalation RCR</b>	0.07	1.5
<b>Dermal exposure (mg/kg bw/d)</b>	0.3	0.18
<b>Dermal DNEL (mg/kg bw/d)</b>	10.53	8.15
<b>Dermal RCR</b>	0.03	0.02
<b>Total RCR</b>	0.1	1.52

RCR	SSbD Step 3	Criteria evaluation
> 1.5	0	Fail the criteria
1 - 1.5	1	
0.75 - 1	2	Pass the criteria
< 0.5	3	

*RCR (Risk Characterization Ratio) = Exposure/safe limit; RCR < 1 is safe; RCR ≥ 1 is unsafe*

# Lessons learnt from the example



For downstream users, SSbD is mainly applied on (alternative) materials in re-design phase → don't generate data on material and depending on information from suppliers (also downstream users) for hazard assessment.

Most of materials for paints and coatings are mixtures and not pure substance vs. chemical safety assessment is on substance → extra complicated to apply SSbD assessment

Inconsistent conclusions on chemical safety/risk assessment under different frameworks and methodologies → What does it mean for SSbD assessment?

Reactive chemistry required for functions (e.g. product durability) vs. Non-hazardous materials

Intensive expertise and resource is needed

# Questions?

