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EUROPEAN CHEMICALS AGENCY

# An illustrative example of the exposure scenarios to be annexed to the safety data sheet

Part 2: Example

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# Editorial note and disclaimer

This illustrative exposure scenario (ES) to be annexed to the safety data sheet (hereafter referred to as an ES for communication) is derived from the "illustrative example CSR" published on the European Chemical Agency (ECHA) website for a hypothetical substance (the so-called "ECHA substance"). It has been developed with input received from industry associations and Member States. ECHA does not accept any liability as to the completeness of this illustrative example and its compliance with the obligations imposed under the REACH Regulation. Users are reminded that the text of the REACH Regulation is the only authentic legal reference and that the information in this document does not constitute legal advice.

For understanding the scope and the purpose of this document, please read also Part 1: Introductory Note and the description on the webpage (http://echa.europa.eu/support/practical-examples-of-exposure-scenarios). This document includes Comments bubbles. These provide additional explanations to the reader but they are not meant to be part of the ES for communication itself.

The ESCom Standard Phrase Catalogue was used extensively in developing the example; version 1.4 was available at the time of publication. When a suitable phrase could not be identified in the ESCom Standard Phrase catalogue, a new phrase has been used for exemplification purposes. In such cases, the new phrase has been written in Italic in this document.

This illustrative ES for communication (with the exception of the Comments bubbles) has been generated using a Chesar 2.3 file. The format, layout and content of this example reflect the output from this tool. The Chesar 2.3 data file is also published on the ECHA website at http://echa.europa.eu/support/practical-examples-of-exposure-scenarios.

# ES FOR COMMUNICATION

**Substance Name:** ECHA substance[1]

**EC Number:**

**CAS Number:** 11111-11-1

**Registration Number:**

**Date of Generation/Revision:** 24/06/2014

**Author:** ECHA CSR Example

[1] Due to the relatively low hazard profile of the "ECHA substance", this example does not include a high need for specific Risk Management Measures. As mentioned, the main aim is to illustrate the selection of suitable information for communication and the use of standard phrases.

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# 1. ES 1: Formulation. Various products

## 1.1. Title section

| | |
|---|---|
| **Environment** | |
| CS 1: *Formulation of mixtures* | ERC 2 |
| **Worker** | |
| CS 2: *Raw material transfer and/or dispensing with dedicated equipment* | PROC 8b |
| CS 3: Mixing, milling, dispersing, completion. Batch. Closed systems | PROC 3 |
| CS 4: Mixing, milling, dispersing, completion. Batch. Open systems | PROC 5 |
| CS 5: *Transfer and/or dispensing with non-dedicated equipment* | PROC 8a |
| CS 6: *Transfer and/or dispensing with dedicated equipment* | PROC 8b |
| CS 7: *Filling small containers in dedicated lines* | PROC 9 |
| CS 8: Equipment cleaning and maintenance | PROC 8a |

## 1.2. Conditions of use affecting exposure

### 1.2.1. Control of environmental exposure: *Formulation of mixtures* (ERC 2)

| |
|---|
| **Amount used, frequency and duration of use (or from service life)** |
| Daily amount per site <= 0.5 tonnes/day |
| Annual amount per site <= 100.0 tonnes/year |
| **Technical and organisational conditions and measures** |
| *Collect water from process and/or cleaning operation as waste* |
| **Conditions and measures related to treatment of waste (including article waste)** |
| Hazardous waste incineration |

### 1.2.2. Control of worker exposure: *Raw material transfer and/or dispensing with dedicated equipment* (PROC 8b)

| |
|---|
| **Product (article) characteristics** |
| *Covers percentage substance in the product up to 100 %.* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. |
| Use suitable eye protection. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

**Comment [ECHA1]:** Formulation takes place in a range of industrial settings, from environments where good control standards apply to those where control are limited or non-existant. This exposure scenario assumes that industrial control standards apply

**Comment [ECHA2]:** A field "ES name" that provides a short description of the scope of the ES can be included here. This will be considered for implementation in the next version of Chesar.

**Comment [ECHA3]:** The approach to describing open and closed processes is under consideration. In this example, it is stated in the CS title whether the process is open or closed

**Comment [ECHA4]:** Some conditions of use (e.g. indoor use, basic general ventilation, process temperature) are valid for all workers' contributing scenarios. These "common conditions of use" could be reported in one place. This will be considered for implementation in the next version of Chesar.

**Comment [ECHA5]:** The numbering of the contributing scenario (CS1, CS2, … as it is in the Title section) could be included here. This will be considered for implementation in the next version of Chesar.

**Comment [ECHA6]:** Although this statement does not constrain the use of the substance, it is included because making explicit the upper boundaries for concentration and duration increases clarity for the recipients.

ESCom standard phrases for concentration of 100% and duration of 8 hours include the statement "unless otherwise stated". This statement was removed as it is preferable that any other different limits that apply are given.

### 1.2.3. Control of worker exposure: Mixing, milling, dispersing, completion. Batch. Closed systems (PROC 3)

| |
|---|
| **Product (article) characteristics** |
| *Covers percentage substance in the product up to 100 %.* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Use in closed batch process (synthesis or formulation) |
| Local exhaust ventilation - efficiency of at least 90.0 % |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Use suitable eye protection. |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. Personal measures have to be applied in case of potential exposure only. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

**Comment [ECHA7]:** This phrase was included to advise the downstream user to use personal protective equipment (PPE) only when exposure is likely to occur, so that this condition of use is not overly precautionary, with over-use of PPE. This comment applies to all other CS where this phrase is used.

### 1.2.4. Control of worker exposure: Mixing, milling, dispersing, completion. Batch. Open systems (PROC 5)

| |
|---|
| **Product (article) characteristics** |
| *Covers percentage substance in the product up to 100 %.* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Local exhaust ventilation - efficiency of at least 90.0 % |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. |
| Use suitable eye protection. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

**Comment [ECHA8]:** Information in the SDS, such as gloves materials, filter types, etc. has the same impact on DU obligations (art 37 of REACH Regulation) as if it were contained in the ES.

### 1.2.5. Control of worker exposure: *Transfer and/or dispensing with non dedicated equipment* (PROC 8a)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |

| |
|---|
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 1.2.6. Control of worker exposure: *Transfer and/or dispensing with dedicated equipment* (PROC 8b)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 1.2.7. Control of worker exposure: *Filling small containers in dedicated lines* (PROC 9)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 1.2.8. Control of worker exposure: Equipment cleaning and maintenance (PROC 8a)

**Comment [ECHA9]:** There is no specific PROC to describe maintenance and cleaning operation. PROC 8a has been used here as it assumes direct contact with the substance and exposure is expected. Ways to improve how maintenance and cleaning tasks can be described and assessed are under review.

| |
|---|
| **Product (article) characteristics** |
| *Covers percentage substance in the product up to 100 %.* |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 4 hours.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. |
| Wear a respirator providing a minimum efficiency of 90.0 %. For further specification, refer to section 8 of the SDS. |
| Use suitable eye protection. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

## 1.3. Exposure estimation and reference to its source

### 1.3.1. Environmental release and exposure: *Formulation of mixtures* (ERC 2)

| Release route | Release rate | Release estimation method |
|---|---|---|
| **Water** | 0 kg/day | Release factor<br>*(ESD Coatings)* |
| **Air** | 3 kg/day | Release factor<br>*(ESD Coatings)* |
| **Soil** | 0 kg/day | Release factor |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Freshwater | 2.823E-6 mg/L | < 0.01 |
| Sediment (freshwater) | 2.292E-4 mg/kg dw | < 0.01 |
| Marine water | 3.29E-7 mg/L | < 0.01 |
| Sediment (marine water) | 2.672E-5 mg/kg dw | < 0.01 |
| Sewage treatment plant | 0 mg/L | < 0.01 |
| Agricultural soil | 6.846E-4 mg/kg dw | < 0.01 |
| Man via Environment – Inhalation | 4.576E-4 mg/m³ | < 0.01 |
| Man via Environment – Oral | 9.222E-4 mg/kg bw/day | < 0.01 |

### 1.3.2. Worker exposure: *Raw material transfer and/or dispensing with dedicated equipment* (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 12.5 mg/m³ (TRA Worker 3.0) | 0.506 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.898 |

### 1.3.3. Worker exposure: Mixing, milling, dispersing, completion. Batch. Closed systems (PROC 3)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 3.75 mg/m³ (TRA Worker 3.0) | 0.152 |
| Dermal, systemic, long-term | 0.69 mg/kg bw/day (TRA Worker 3.0) | 0.099 |
| Combined routes, systemic, long-term | | 0.25 |

### 1.3.4. Worker exposure: Mixing, milling, dispersing, completion. Batch. Open systems (PROC 5)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 6.25 mg/m³ (TRA Worker 3.0) | 0.253 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.645 |

### 1.3.5. Worker exposure: *Transfer and/or dispensing with non dedicated equipment* (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 5 mg/m³ (TRA Worker 3.0) | 0.202 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.594 |

### 1.3.6. Worker exposure: *Transfer and/or dispensing with dedicated equipment* (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.493 |

### 1.3.7. Worker exposure: *Filling small containers in dedicated lines* (PROC 9)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 12.5 mg/m³ (TRA Worker 3.0) | 0.506 |
| Dermal, systemic, long-term | 1.372 mg/kg bw/day (TRA Worker 3.0) | 0.196 |
| Combined routes, systemic, long-term | | 0.702 |

### 1.3.8. Worker exposure: Equipment cleaning and maintenance (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 7.5 mg/m³ (TRA Worker 3.0) | 0.304 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.695 |

## 1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

**Comment [ECHA10]:** Information on scaling is typically included in this section. It must include:
- Scaling method
- Scalable parameters
- Boundaries of scaling

# 2. ES 2: Use at industrial site. Coatings and paints, thinners, paint removers

## 2.1. Title section

Comment [ECHA11]: See comment in corresponding section in ES1

| | |
|---|---|
| Coatings and Paints, Thinners, paint removers (PC 9a) | |
| **Environment** | |
| CS 1: Industrial application of coatings and inks. *Water-based scrubbing process* | ERC 5 |
| CS 2: Industrial application of coatings and inks. Dry processes | ERC 5 |
| **Worker** | |
| CS 3: Industrial application of coatings and inks. Closed systems. With occasional controlled exposure | PROC 2 |
| CS 4: *Raw material transfer and/or dispensing with dedicated equipment* | PROC 8b |
| CS 5: Mixing operations (open systems) | PROC 5 |
| CS 6: Loading of application equipment. Manual | PROC 8a |
| CS 7: Spraying | PROC 7 |
| CS 8: Roller, spreader, flow coating or printing | PROC 10 |
| CS 9: Dipping, immersion and pouring | PROC 13 |
| CS 10: Force drying (50 – 100oC) | PROC 2 |
| CS 11: Equipment cleaning and maintenance. Manual | PROC 8a |

Comment [ECHA12]: The approach to characterise closed is under development. In this case the PROC 2 descriptor does not fit as it refers to continuous processes.

## 2.2. Conditions of use affecting exposure

Comment [ECHA13]: See comments in corresponding section in ES1

### 2.2.1. Control of environmental exposure: Industrial application of coatings and inks. *Water-based scrubbing process* (ERC 5)

| |
|---|
| **Amount used, frequency and duration of use (or from service life)** |
| Daily amount per site <= 0.02 tonnes/day |
| Annual amount per site <= 4.0 tonnes/year |
| **Technical and organisational conditions and measures** |
| *Remove sludge regularly from process/cleaning water in reservoir.* |
| *Equalising tank required.* Continuous releases. |
| **Conditions and measures related to sewage treatment plant** |
| Estimated substance removal from wastewater via municipal sewage treatment 22 % |
| Assumed municipal sewage treatment plant flow >= 2000 m3/d |
| **Conditions and measures related to treatment of waste (including article waste)** |
| Dispose of waste or used sacks/containers according to local regulations. |
| **Other conditions affecting environmental exposure** |
| Receiving surface water flow >= 18000 m3/d |

### 2.2.2. Control of environmental exposure: Industrial application of coatings and inks. Dry processes (ERC 5)

| |
|---|
| **Amount used, frequency and duration of use (or from service life)** |
| Daily amount per site <= 0.02 tonnes/day |
| Annual amount per site <= 4.0 tonnes/year |

| **Conditions and measures related to treatment of waste (including article waste)** |
|---|
| Dispose of waste or used sacks/containers according to local regulations. |

### 2.2.3. Control of worker exposure: Industrial application of coatings and inks. Closed systems. With occasional controlled exposure (PROC 2)

| **Product (article) characteristics** |
|---|
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Use in closed, continuous process with occasional controlled exposure |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

**Comment [ECHA14]:** The approach to describing open and closed processes is under consideration.

### 2.2.4. Control of worker exposure: *Raw material transfer and/or dispensing with dedicated equipment* (PROC 8b)

| **Product (article) characteristics** |
|---|
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 2.2.5. Control of worker exposure: Mixing operations (open systems) (PROC 5)

| **Product (article) characteristics** |
|---|
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 2.2.6. Control of worker exposure: Loading of application equipment. Manual (PROC 8a)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 1 hour.<br>*The duration specified here is within the context of an eight hour work day* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 2.2.7. Control of worker exposure: Spraying (PROC 7)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Local exhaust ventilation - efficiency of at least 95.0 % |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| *Wear suitable chemical resistant sleeves and gloves.* For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |
| **Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply** |
| Use suitable eye protection. Personal measures have to be applied in case of potential exposure only. |
| Wear suitable coveralls to prevent exposure to the skin. *Wear protective shoes.* |
| *Wear respiratory protection.* Personal measures have to be applied in case of potential exposure only. |

**Comment [ECHA15]:** Sleeves are required as upper wrists are potentially exposed according to ECETOC TRA assumptions

**Comment [ECHA16]:** Protective shoes were added here, as coveralls may not include foot cover. It is preferable to express the condition in one single phrase: "*Wear suitable coveralls to prevent exposure to the skin, including protective shoes*". However two separate phrases are used here as the first is available in the ESCom standard phrase catalogue.

### 2.2.8. Control of worker exposure: Roller, spreader, flow coating or printing (PROC 10)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Local exhaust ventilation - efficiency of at least 90.0 % |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |
| **Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply** |
| Use suitable eye protection. Personal measures have to be applied in case of potential exposure only. |

| |
|---|
| Wear suitable gloves tested to EN374. Personal measures have to be applied in case of potential exposure only. |

### 2.2.9. Control of worker exposure: Dipping, immersion and pouring (PROC 13)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Local exhaust ventilation - efficiency of at least 90.0 % |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |
| **Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply** |
| Use suitable eye protection. Personal measures have to be applied in case of potential exposure only. |
| Wear suitable gloves tested to EN374. Personal measures have to be applied in case of potential exposure only. |

### 2.2.10. Control of worker exposure: Force drying (50 – 100oC) (PROC 2)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| Use in closed, continuous process with occasional controlled exposure |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 70.0 °C |

**Comment [ECHA17]:** The approach to describing open and closed processes is under consideration.

### 2.2.11. Control of worker exposure: Equipment cleaning and maintenance; Manual (PROC 8a)

**Comment [ECHA18]:** See comment in corresponding section in ES1(for CS8)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 4 hours.<br>*The duration specified here is within the context of an eight hour work day.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

## 2.3. Exposure estimation and reference to its source

### 2.3.1. Environmental release and exposure: Industrial application of coatings and inks; Water-based process (ERC 5)

| Release route | Release rate | Release estimation method |
|---|---|---|
| **Water** | 0.1 kg/day | SpERC based<br><br>xxxx 5.1 - a.v1<br>Industrial use of coatings and inks (low volatiles) - Process with water involved (low volatiles, medium water solubility) |
| **Air** | 0.2 kg/day | SpERC based<br><br>same as above |
| **Soil** | 0 kg/day | SpERC based<br><br>same as above |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Freshwater | 0.004 mg/L | 0.378 |
| Sediment (freshwater) | 0.316 mg/kg dw | 0.377 |
| Marine water | 3.891E-4 mg/L | 0.378 |
| Sediment (marine water) | 0.032 mg/kg dw | 0.378 |
| Sewage treatment plant | 0.039 mg/L | 0.026 |
| Agricultural soil | 0.025 mg/kg dw | 0.154 |
| Man via Environment – Inhalation | 3.109E-5 mg/m³ | < 0.01 |
| Man via Environment – Oral | 0.017 mg/kg bw/day | < 0.01 |

### 2.3.2. Environmental release and exposure: Industrial application of coatings and inks; Dry processes (ERC 5)

| Release route | Release rate | Release estimation method |
|---|---|---|
| **Water** | 0 kg/day | SpERC based<br><br>xxxx 5.1 - c.v1<br>Industrial use of coatings and inks (low volatiles) - Water free process (low volatiles) |
| **Air** | 0.2 kg/day | SpERC based<br><br>same as above |
| **Soil** | 0 kg/day | SpERC based<br><br>same as above |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Freshwater | 2.823E-6 mg/L | < 0.01 |
| Sediment (freshwater) | 2.292E-4 mg/kg dw | < 0.01 |
| Marine water | 3.29E-7 mg/L | < 0.01 |
| Sediment (marine water) | 2.672E-5 mg/kg dw | < 0.01 |
| Sewage treatment plant | 0 mg/L | < 0.01 |
| Agricultural soil | 4.731E-5 mg/kg dw | < 0.01 |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Man via Environment – Inhalation | 3.109E-5 mg/m³ | < 0.01 |
| Man via Environment – Oral | 8.029E-5 mg/kg bw/day | < 0.01 |

### 2.3.3. Worker exposure: Industrial application of coatings and inks. Closed systems. With occasional controlled exposure (PROC 2)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 0.274 mg/kg bw/day (TRA Worker 3.0) | 0.039 |
| Combined routes, systemic, long-term | | 0.14 |

### 2.3.4. Worker exposure: *Raw material transfer and/or dispensing with dedicated equipment* (PROC 8b)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.493 |

### 2.3.5. Worker exposure: Mixing operations (open systems) (PROC 5)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.493 |

### 2.3.6. Worker exposure: Loading of application equipment. Manual (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 5 mg/m³ (TRA Worker 3.0) | 0.202 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.594 |

### 2.3.7. Worker exposure: Spraying (PROC 7)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 12.5 mg/m³ (TRA Worker 3.0) | 0.506 |
| Dermal, systemic, long-term | 1.714 mg/kg bw/day (TRA Worker 3.0) | 0.245 |
| Combined routes, systemic, long-term | | 0.751 |

### 2.3.8. Worker exposure: Roller, spreader, flow coating or printing (PROC 10)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 5.486 mg/kg bw/day (TRA Worker 3.0) | 0.784 |
| Combined routes, systemic, long-term | | 0.885 |

### 2.3.9. Worker exposure: Dipping, immersion and pouring (PROC 13)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.493 |

### 2.3.10. Worker exposure: Force drying (50 – 100oC) (PROC 2)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 2.5 mg/m³ (TRA Worker 3.0) | 0.101 |
| Dermal, systemic, long-term | 0.274 mg/kg bw/day (TRA Worker 3.0) | 0.039 |
| Combined routes, systemic, long-term | | 0.14 |

### 2.3.11. Worker exposure: Equipment cleaning and maintenance. Manual (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 15 mg/m³ (TRA Worker 3.0) | 0.607 |
| Dermal, systemic, long-term | 0.548 mg/kg bw/day (TRA Worker 3.0) | 0.078 |
| Combined routes, systemic, long-term | | 0.686 |

## 2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

**Comment [ECHA19]:** See comment in corresponding section in ES1

# 3. ES 3: Use by professional worker. Coatings and paints, thinners, paint removers

## 3.1. Title section

| | |
|---|---|
| Coatings and Paints, Thinners, paint removers (PC 9a) | |
| **Environment** | |
| CS 1: *Use leading to inclusion into/onto matrix* | ERC 8f, ERC 8c |
| **Worker** | |
| CS 2: *Transfer and/or dispensing with non dedicated equipment* | PROC 8a |
| CS 3: Professional application of coatings and inks by brush or roller | PROC 10 |
| CS 4: Professional application of coatings and inks by spraying | PROC 11 |

## 3.2. Conditions of use affecting exposure

### 3.2.1. Control of environmental exposure: *Use leading to inclusion into/onto matrix* (ERC 8f)

| **Conditions and measures related to treatment of waste (including article waste)** |
|---|
| Dispose of waste or used sacks/containers according to local regulations. |

### 3.2.2. Control of worker exposure: *Transfer and/or dispensing with non dedicated equipment* (PROC 8a)

| **Product (article) characteristics** |
|---|
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| Avoid carrying out activities involving exposure for more than 15 minutes.<br>*The duration specified here is within the context of an eight hour work day.* |
| **Technical and organisational conditions and measures** |
| Provide a basic standard of general ventilation (1 to 3 air changes per hour). |
| **Other conditions affecting workers exposure** |
| Indoor use |
| Assumes process temperature up to 40.0 °C |

### 3.2.3. Control of worker exposure: Professional application of coatings and inks by brush or roller (PROC 10)

| **Product (article) characteristics** |
|---|
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| Wear suitable gloves tested to EN374. For further specification, refer to section 8 of the SDS. |
| **Other conditions affecting workers exposure** |
| *Handling of liquids on large surfaces or large workpieces* |

**Comment [ECHA20]:** See comment in corresponding section in ES1

**Comment [ECHA21]:** Maintenance and cleaning for professional use should normally be included here. However, they were not included in the illustrative example CSR and, for consistency, they are omitted here. They will be included in future updates of both documents.

**Comment [ECHA22]:** See comments in corresponding section in ES1

**Comment [ECHA23]:** Environmental conditions of use related to Sewage Treatment Plant (STP) , application of sludge to agricultural soil, etc. are of no relevance to a professional user or a consumer, who has no control over these conditions. Consequently are not included in the environmental Contributing Scenario.

| |
|---|
| Assumes room volume of less than 100 m3. |
| **Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply** |
| Use suitable eye protection. Personal measures have to be applied in case of potential exposure only. |

**Comment [ECHA24]:** The exposure estimation was undertaken using Stoffenmanager, and this phrase is from a Stoffenmanager proposal. It may be amended in future to be more helpful as an instruction provided by the formulator to the user.

### 3.2.4. Control of worker exposure: Professional application of coatings and inks by spraying (PROC 11)

| |
|---|
| **Product (article) characteristics** |
| Limit the substance content in the product to 5 %. |
| **Amount used (or contained in articles), frequency and duration of use/exposure** |
| *Covers daily exposures up to 8 hours.* |
| **Technical and organisational conditions and measures** |
| **Conditions and measures related to personal protection, hygiene and health evaluation** |
| *Wear suitable chemical resistant sleeves and gloves.* For further specification, refer to section 8 of the SDS. |
| *Wear a half mask respirator with filter/cartridge (gas cartridge) - efficiency of at least: 60%* |
| **Other conditions affecting workers exposure** |
| *Handling of liquids at high pressure resulting in substantial generation of mist or spray-haze* |
| Assumes room volume of less than 100 m3. |
| **Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply** |
| Use suitable eye protection. Personal measures have to be applied in case of potential exposure only. |
| Wear suitable coveralls to prevent exposure to the skin. *Wear protective shoes.* |

## 3.3. Exposure estimation and reference to its source

### 3.3.1. Environmental release and exposure: *Use leading to inclusion into/onto matrix* (ERC 8f)

| Release route | Release rate | Release estimation method |
|---|---|---|
| **Water** | 2.75E-4 kg/day | ERC based |
| **Air** | 0.004 kg/day | ERC based |
| **Soil** | 1.375E-4 kg/day | ERC based |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Freshwater | 1.351E-5 mg/L | < 0.01 |
| Sediment (freshwater) | 0.001 mg/kg dw | < 0.01 |
| Marine water | 1.398E-6 mg/L | < 0.01 |
| Sediment (marine water) | 1.135E-4 mg/kg dw | < 0.01 |
| Sewage treatment plant | 1.07E-4 mg/L | < 0.01 |
| Agricultural soil | 7.002E-5 mg/kg dw | < 0.01 |
| Man via Environment - Inhalation | 6.315E-7 mg/m³ | < 0.01 |
| Man via Environment - Oral | 9.955E-5 mg/kg bw/day | < 0.01 |

### 3.3.2. Worker exposure: *Transfer and/or dispensing with non dedicated equipment* (PROC 8a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 6.25 mg/m³ (TRA Worker 3.0) | 0.253 |

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Dermal, systemic, long-term | 2.742 mg/kg bw/day (TRA Worker 3.0) | 0.392 |
| Combined routes, systemic, long-term | | 0.645 |

### 3.3.3. Worker exposure: Professional application of coatings and inks by brush or roller (PROC 10)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 6.683 mg/m³ (External Tool: *Stoffenmanager 5.0*) | 0.271 |
| Dermal, systemic, long-term | 1.097 mg/kg bw/day (TRA Worker 3.0) | 0.157 |
| Combined routes, systemic, long-term | | 0.427 |

### 3.3.4. Worker exposure: Professional application of coatings and inks by spraying (PROC 11)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 5.92 mg/m³ (External Tool: *Stoffenmanager 5.0*) | 0.24 |
| Dermal, systemic, long-term | 4.286 mg/kg bw/day (TRA Worker 3.0) | 0.612 |
| Combined routes, systemic, long-term | | 0.852 |

## 3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

**Comment [ECHA25]:** See comment in corresponding section in ES1

# 4. ES 4: Consumer Use. Coatings and paints, thinners, paint removers

## 4.1. Title section

Comment [ECHA26]: See comment in corresponding section in ES1

| | |
|---|---|
| Coatings and Paints, Thinners, paint removers (PC 9a) | |
| **Environment** | |
| CS 1: *Use leading to inclusion into/onto matrix* | ERC 8f, ERC 8c |
| **Consumer** | |
| CS 2: Waterborne wall paint. Brush or roller | PC 9a |
| CS 3: Solvent rich paint. Brush or roller | PC 9a |

## 4.2. Conditions of use affecting exposure

Comment [ECHA27]: See comments in corresponding section in ES1

### 4.2.1. Control of environmental exposure: *Use leading to inclusion into/onto matrix* (ERC 8f)

| **Conditions and measures related to treatment of waste (including article waste)** |
|---|
| Dispose of waste or used sacks/containers according to local regulations. |

### 4.2.2. Control of consumer exposure: Waterborne wall paint. Brush or roller (PC 9a)

Comment [ECHA28]: The conditions of use regarded as relevant for the formulator and to be provided in the ES for communication include:
-Concentration, which sets the upper limit of the substance in the product (paints) the formulator can supply to the consumer market
-Amount per event and release area, from which the formulator can check whether the area specific amount per application (g/m2) is consistent with the technical instruction he provides to the user.

| **Product (article) characteristics** |
|---|
| Covers concentrations up to 1.0 % |
| **Amount used, frequency and duration of use/exposure** |
| *Covers use of product up to 3750 grams/event* |
| Covers use up 1 events/day |
| **Other conditions affecting consumers exposure** |
| Release area = 15.0 m2 |

### 4.2.3. Control of consumer exposure: Solvent rich paint. Brush or roller (PC 9a)

| **Product (article) characteristics** |
|---|
| Covers concentrations up to 1.0 % |
| **Amount used, frequency and duration of use/exposure** |
| *Covers use of product up to 1000 grams/event* |
| Covers use up 1 events/day |
| **Other conditions affecting consumers exposure** |
| Release area = 10.0 m2 |

## 4.3. Exposure estimation and reference to its source

### 4.3.1. Environmental release and exposure: *Use leading to inclusion into/onto matrix* (ERC 8f)

| **Release route** | **Release rate** | **Release estimation method** |
|---|---|---|
| **Water** | 2.75E-4 kg/day | ERC based |

| Release route | Release rate | Release estimation method |
|---|---|---|
| **Air** | 0.004 kg/day | ERC based |
| **Soil** | 1.375E-4 kg/day | ERC based |

| Protection target | Exposure estimate (based on: EUSES 2.1.2) | RCR |
|---|---|---|
| Freshwater | 1.351E-5 mg/L | < 0.01 |
| Sediment (freshwater) | 0.001 mg/kg dw | < 0.01 |
| Marine water | 1.398E-6 mg/L | < 0.01 |
| Sediment (marine water) | 1.135E-4 mg/kg dw | < 0.01 |
| Sewage treatment plant | 1.07E-4 mg/L | < 0.01 |
| Agricultural soil | 7.002E-5 mg/kg dw | < 0.01 |
| Man via Environment - Inhalation | 6.315E-7 mg/m³ | < 0.01 |
| Man via Environment – Oral | 9.955E-5 mg/kg bw/day | < 0.01 |

### 4.3.2. Consumer exposure: Waterborne wall paint. Brush or roller (PC 9a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 0.3 mg/m³ (External Tool: *Consexpo 4.1*) | 0.049 |
| Dermal, systemic, long-term | 0.6 mg/kg bw/day (External Tool: *Consexpo 4.1*) | 0.171 |
| Oral, systemic, long-term | 0 mg/kg bw/day (External Tool: *Consexpo 4.1*) | < 0.01 |
| Combined routes, systemic, long-term | | 0.221 |

### 4.3.3. Consumer exposure: Solvent rich paint. Brush or roller (PC 9a)

| Route of exposure and type of effects | Exposure estimate | RCR |
|---|---|---|
| Inhalation, systemic, long-term | 0.78 mg/m³ (External Tool: *Consexpo 4.1*) | 0.128 |
| Dermal, systemic, long-term | 0.55 mg/kg bw/day (External Tool: *Consexpo 4.1*) | 0.157 |
| Oral, systemic, long-term | 0 mg/kg bw/day (External Tool: *Consexpo 4.1*) | < 0.01 |
| Combined routes, systemic, long-term | | 0.285 |

## 4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

**Comment [ECHA29]:** This section may include advice to the downstream users on how they can verify that their customer use is covered by the ES

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